Goldman Sachs 150 YEARS

The Goldman Sachs Group, Inc.

# Annual Report

# 2018

# Fellow Shareholders:

The opportunity to lead Goldman Sachs is extraordinarily humbling and exciting, made even more so as this year is the firm's 150th anniversary. Like each of my predecessors, my responsibility is to preserve the legacy of Goldman Sachs, while remaining open to the change and innovation that best meets the needs of our clients.

I am privileged to be surrounded by exceptionally talented people at all levels of our firm, including John Waldron, our President and Chief Operating Officer, and Stephen Scherr, our Chief Financial Officer, who are also intensely focused on ensuring that clients are at the center of everything we do — and in doing so, creating long-term value for our shareholders.

While much has changed over the course of our 150-year history, teamwork, integrity, adaptability and client service remain at the core of our culture.

The strength of our culture and client franchise was at the heart of our financial performance in 2018. We achieved record diluted earnings per common share, and attained our highest annual return on average common shareholders' equity and return on average tangible common shareholders' equity since 2009. Net revenues of $36.62 billion and pre-tax earnings of $12.48 billion were both 12 percent higher compared with 2017 and the highest since 2010. Book value per common share and tangible book value per common share increased by 15 percent during the year to $207.36 and $196.64, respectively.

**2018 Financial Performance**

| 13.3% | 14.1% | $36.6B | 15% |
|---|---|---|---|
| ROE | ROTE | NET REVENUES | BVPS GROWTH |

*(from left to right)*

**Stephen M. Scherr**
Chief Financial Officer

**David M. Solomon**
Chairman and
Chief Executive Officer

**John E. Waldron**
President and
Chief Operating Officer

## Our Strategy

This performance, alongside our strong levels of capital and liquidity, put Goldman Sachs on a solid foundation. As we look ahead, our focus is on delivering sustainable, long-term returns for our shareholders through a strategy that revolves around our clients.

Our strategy comprises three core priorities:

- Growing and strengthening our existing businesses by deepening our relationships with existing clients, and expanding our capabilities to serve new clients;
- Diversifying our business mix by increasing our fee-based or more recurring revenues, including by launching new products and services; and,
- Achieving greater operating efficiency across all areas of the firm, including expenses, funding costs and capital, without compromising the long-standing strength of our control and risk management functions.

Our strategy reflects the need to anticipate and adapt to the structural forces that shape economies and industries and how our clients operate within them. Markets, financial instruments and products and different client segments are converging and competing with one another at an unprecedented pace.

This requires us to simultaneously invest for growth and to create better efficiencies in the way we run certain businesses. I have advised companies for over three decades and the ones I have admired most are those that have managed their resources to allow for both investment and shareholder return. This is particularly critical when you consider how technology is influencing the way institutions and consumers alike are transacting in various markets and products, including in our industry.

In that context, across a number of our businesses, particularly our market-making businesses, we have to achieve the scale necessary to execute transactions in the most effective way for our clients. That means investing in platforms and empowering those who build them. It means encouraging the innovative ideas of our people that take good products and make them great. And it means looking at the revenues and expenses of businesses "front-to-back" so that we have a clear-eyed view of where technology investments, the allocation of capital and other resources will be most critical to best delivering our advice, execution and risk management to our clients.

Since last fall, we have undertaken a review of each of our major businesses and the core activities within them. Each review has reinforced the fact that we benefit enormously from a strong client franchise around the world. At the same time, we see tremendous opportunities to expand our addressable market and grow new businesses. As we pursue these opportunities, our focus on strong risk management and controls will be central to our ability to meet the expectations of our clients and our shareholders.

Over the course of the year, I look forward to communicating more details on our strategic direction and priorities, which will include sharing certain financial metrics and targets to which my colleagues and I will be held accountable. I feel a sense of urgency and excitement about the opportunities we have identified, but, it is also important to be diligent and deliberate and not rush into long-term decision making.

While not exhaustive, I want to spend the bulk of this letter providing you with a sense of the opportunities and priorities we will be focused on in the months and years ahead.

## Grow and Strengthen Our Existing Businesses

Our first strategic priority is to expand our existing businesses and we are executing on a variety of growth initiatives to that end.

In Investment Banking, for example, we have embarked on a broad footprint expansion strategy that includes hiring new senior bankers, adding coverage for more than 1,000 new companies, and creating opportunities to help more clients access equity capital and debt financing. As of year end, we have made significant progress, having assigned coverage on approximately 95 percent of our targeted universe of new clients across the Americas and EMEA.

Across FICC and Equities, we have strong institutional wallet share, which has improved by 65 and 110 basis points, respectively, since 2016.[1] When I talk with many of our clients, it is clear that they value FICC's deep risk intermediation capabilities and expertise. In addition to that focus, we continue to leverage platforms that integrate execution, analytics and content for our clients. In Equities, we are growing our electronic execution business through the development of low-touch platforms. And, we are working with more corporate clients in EMEA and Asia, particularly as it relates to our ability to deliver risk management solutions to them.

Over the past five years, Investment Management has generated organic, long-term fee-based net inflows of approximately $215 billion. We see further potential in this business by growing our advisory and outsourced CIO services, as well as by expanding our product offering — notably, our Alternatives platform and ETFs. We are also expanding our world-class private wealth management business by adding new private wealth advisors and increasing our collateralized lending to clients.

Within Investing & Lending, our Merchant Banking business comprises a diversified portfolio across Corporate Private Equity and global Real Estate that is managed by hundreds of investment professionals and led by tenured senior leadership. Our strong track record, built over the course of several decades, positions us well to provide clients with additional attractive investing opportunities.

1 Wallet share through first nine months of 2018 as full-year data not yet available. Source: Coalition

These various initiatives to strengthen and grow our existing businesses will be underscored by an emphasis on delivering the full value of *One Goldman Sachs* to our clients. An increasing number of institutions and companies interact with different parts of our firm. They don't view their relationship with Goldman Sachs through the prism of a product or division. Historically, we have tended to manage our client relationships through more of a divisional lens, which can sometimes limit a more holistic view of how best to identify and meet the needs of these clients who are global, complex and multifaceted.

One of my first priorities as CEO has been to ensure that the full range of our services and skill set is more accessible, comprehensive and efficiently delivered. In that vein, we have formed a cross-divisional client initiative, led by senior leaders in our Institutional Client Services, Investment Management and Investment Banking businesses to work with a pilot group of clients with multidimensional business needs.

Even at this early stage, I am encouraged by the feedback from our clients and what we have learned from them. Over time, we plan to expand this initiative to a broader group of clients with the simple goal of ensuring that we are orienting our client coverage around what is most important to our clients regardless of division or product area focus.

### Diversify Our Business Mix with New Products and Services

A second element of our strategy is a focus on more durable revenues through lending and deposit activities, cash management and wealth management. We have made considerable progress over the past five years, but there is more we can do in the years ahead.

In 2016, we established Marcus: by Goldman Sachs, our digital consumer financial services business. We are working to connect our growing customer base — and their growing wealth — to our broader suite of services as we develop a multitiered digital wealth management offering. Over time, we expect this will grow to be another core capability of our client-centric multiproduct Marcus platform.

We are pleased with our early progress: we have more than 3 million total customers, $36 billion in consumer deposits in the U.S. and the U.K., and nearly $5 billion of consumer loans. We are cognizant of the risk profile of our nascent consumer lending business and will remain attentive to where we are in the cycle as we grow our business for the long term.

We are also developing a dynamic, digital cash management and payments platform for corporate clients. And, the potential for Goldman Sachs in this space is significant. The industry cash management wallet is larger than the global investment banking wallet we compete for today.

As the leading M&A advisor globally, companies already trust us to provide advice on their most significant transactions. We will build on these strong relationships and forge new ones by delivering new solutions that solve customer frustrations around outdated technology and limited customization and analytics.

We see a real opportunity to provide clients with a modern, global cash management platform that is both secure and flexible. We expect this business to be accretive to our return profile and to provide a number of benefits to adjacent businesses, including growing deposits and generating more client flows for our currencies franchise.

We are making tangible progress in building this platform and I expect that we will launch a cash management offering to clients next year.

### Achieve Greater Operating Efficiency

Our third strategic priority is to ensure we are maximizing operating efficiency by investing in automation and technology that will improve the client experience and drive expense savings across our businesses.

For instance, in FICC, we are a top-2 institutional provider and gained share in six of eight asset classes

## OUR STRATEGY

### OBJECTIVES

- GROW AND STRENGTHEN OUR EXISTING BUSINESSES
- DIVERSIFY OUR BUSINESS MIX WITH NEW PRODUCTS AND SERVICES
- ACHIEVE GREATER OPERATING EFFICIENCY

### KEY TENETS

- Delivering “One Firm” to Our Clients
- Pursuing Adjacencies for Growth
- Expanding Addressable Market
- Investing in Technology and Platforms
- Enhancing Market Transparency

### SUPERIOR LONG-TERM TOTAL SHAREHOLDER RETURNS

in 2018,[2] but the opportunity set and the global FICC wallet has declined significantly over the past decade. To adapt, we have made important improvements in FICC's efficiency, reducing standardized risk-weighted assets by 40 percent and expenses by more than 20 percent, each compared to 2013. FICC will continue to be a valuable offering for our clients and we see attractive opportunities to build scale within FICC as the market structure continues to evolve. Part of building scale is through improving the client experience and that means operating more efficiently.

Positioning ourselves for growth across our businesses partially entails funding investments from realized operating leverage in our core businesses. To help enforce this, we are looking at our costs holistically and have improved our firmwide efficiency ratio to 64 percent in 2018, down nearly 2 percentage points over the past two years.

We also are identifying ways to manage our balance sheet more efficiently. We have identified deposits as a strategic focus to diversify our funding mix and lower our funding costs and have grown our deposit base by $34 billion over the past two years to $158 billion at the end of 2018.

### A Culture of Risk Management

As we grow and expand our business reach, bringing Goldman Sachs to more clients and customers, we are dedicated to maintaining the primacy of the control function at the firm and upholding the highest standards in risk and operational management.

There are always important lessons to be learned from difficult situations and as it relates to 1MDB, we have looked back and will continue to reflect on anything else the firm could have done better. It remains a priority for me that our culture of integrity, compliance and escalation only improves from this experience.

Effective risk management is demanding and difficult. It requires constant vigilance and we won't always get it right. But an unwavering cultural commitment to it lies at the heart of an effective financial institution and we believe it is a core competence that helps define Goldman Sachs.

## Our People

I have been fortunate to have worked closely with Lloyd Blankfein over the years, who stepped down as Chairman and CEO last year. Throughout his 36 years of dedicated service to the firm, his keen understanding of markets and risk have been invaluable to keeping the firm both nimble and resolute in the face of constant change. And amidst the most turbulent days of the global financial crisis, it was Lloyd's fortitude and leadership that steadily navigated Goldman Sachs and its people through one of the most difficult episodes in our history. He has been a valued partner and colleague, and I am grateful for his mentorship, judgment and counsel.

In my travels and time with clients, one refrain I hear time and again is that Goldman Sachs is different because of the quality of our people. Our success in delivering for our clients and on our strategic priorities depends on attracting, retaining and developing talented people. Professionals want to be constantly learning, working on important problems that have broad significance to industries, economies and society, and to be surrounded by diverse colleagues.

In my short time as CEO, I've been vocal about the importance of advancing our firm's diversity, including with respect to gender, race, sexual orientation, disability or whatever contributes to who we are. Effectively serving a broad and diverse set of clients means having an appreciation and understanding of their different experiences, interests and values, and we are committed to building a team capable of that critical work. Over the years, the firm's diversity and inclusion efforts have evolved from raising broader awareness and delivering an array of programs to a more deliberate, data-driven and targeted strategy.

2 Wallet share and ranking through first nine months of 2018 as full-year data not yet available. Source: Coalition

We have made progress in recent years and have more diverse representation on our Board of Directors. In addition, our most recent partner class had the highest percentage of women and black partners in our history and, we are nearly there on the campus analyst hiring goals we established last year. But, we have a longer path ahead of us as it relates to our broader diversity ambitions. We are working with our Global Diversity Committee to advance specific goals and objectives. We are undertaking new initiatives aimed at increasing the representation of diverse communities at all levels across the firm. This includes increasing the representation of our analyst and entry-level associate new joiners — which represents more than 70 percent of our annual hiring — to 50 percent women, 11 percent black professionals and 14 percent Hispanic/Latino professionals in the Americas, and 9 percent black professionals in the U.K.

Fundamental change takes time, but if we're rigorous in our execution of incremental change, we will make it happen. We simply do not have a choice but to strive to be one of the most diverse and inclusive institutions in the world. If we are not creative and do not take the right measures to embed a more diverse workforce across every facet of diversity, we put in jeopardy our relevance to our clients and the markets we serve.

## Sustainability

Managing the firm responsibly is core to our goal of driving superior long-term shareholder returns. We cannot be successful over the long term for our investors unless we think broadly about the impact we have on society and our communities — and then, orient ourselves toward ways we can allocate capital purposefully.

A dedication to service and a commitment to using our expertise and convening power to help address broader issues has long been a core element of our culture. Over the course of many years, we have developed innovative and meaningful philanthropic programs that have improved business education and provided access to capital for thousands of women entrepreneurs and small businesses.

Since the launch of our *10,000 Women* initiative in 2008, we have invested over $150 million to help women entrepreneurs across 56 countries, providing practical business education, mentoring, networking and access to capital. Most recently, we have democratized access to business education on a global scale through the introduction of online business education courses. In addition, this past year, the Women Entrepreneurs Opportunity Facility — developed in partnership with the IFC as the first of its kind gender facility — surpassed $1 billion in investments to financial institutions in 31 countries and is well on its way to providing capital to 100,000 women.

Through our *10,000 Small Businesses* program, launched in 2010, we have committed $500 million to provide training and access to capital to small business owners looking to grow and create new jobs in their communities, with compelling results. To date, we have graduated 8,200 small business owners, with 78 percent of graduates reporting revenue increases and 57 percent adding jobs within 30 months of graduation.

We will continue our commitment to these extraordinary programs, but we see an increasing opportunity to focus on some of the other important issues that are facing society today — from the environment to health care to urban development.

For example, our Urban Investment Group (UIG) has been a major investor in community development projects, committing more than $7 billion in underserved American markets since 2001. In 2018, UIG continued its long-term support of the Brooklyn Navy Yard by committing $35 million to renovate Building 127, a 95,000-square-foot manufacturing center that will drive the creation of approximately 300 quality urban manufacturing jobs.

Last year, we announced *Launch With GS*, a $500 million initiative to invest in women-led companies and investment managers. Through this effort, we are harnessing our deep investment expertise to narrow the gender investing gap in three ways: committing firm capital in women-founded, owned or led businesses, directing client capital to invest in women-centered investing firms, and creating an ecosystem to help build future investment opportunities.

More broadly, we have seen fast-paced growth in our Environmental, Social and Governance (ESG) and impact investing platform, which reached $17 billion in assets under supervision at the end of 2018. This includes the launch of an ESG-focused ETF that provides our clients with broad exposure to U.S. large cap companies that rank favorably based on values identified by the American public.

And as another example, at the end of 2018, we reached $80 billion in our goal to finance or invest $150 billion in clean energy by 2025.

**Clean Energy Investments and Financings**

Since 2012:

**$80B**

Target by 2025:

**$150B**

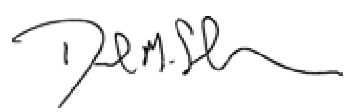
We are a financial institution, operating in global markets, with a global client base — and we have a real opportunity through that work not only to lead by example in how we run our organization, but to drive sustainable outcomes for our clients and for our communities.

## Looking Ahead

Goldman Sachs of 2018 looks very different from the firm Marcus Goldman started a century and a half ago. Frankly, it looks different from when I started here nearly 20 years ago. One of the reasons that Goldman Sachs has succeeded for so long is that it reflects individuals who have been able to adapt with the changing times — from market professionals who see how the emergence of new technologies will create new price setting mechanisms to control-side professionals who react quickly to financial and regulatory changes in an effort to always maintain the firm's risk profile and operational integrity.

What initially attracted me to Goldman Sachs and what has kept me here over the years is our time-honored culture that values teamwork, excellence and problem-solving; it has allowed us not only to survive, but thrive in an industry that is cyclical by nature.

As we look to the future, we are building new businesses and reorienting the firm for a broader set of opportunities. We have a robust approach to risk management and a strong balance sheet with the talent to deploy and protect it. We are investing across our businesses to serve new and existing clients and build upon an extraordinary client franchise. That's why I am very confident of Goldman Sachs' ability to generate strong, industry-leading returns through the cycle.



**David M. Solomon**
Chairman and
Chief Executive Officer

**Our clients' interests always come first.**
Our experience shows that if we serve our clients well, our own success will follow.

**Our assets are our people, capital and reputation.**
If any of these is ever diminished, the last is the most difficult to restore. We are dedicated to complying fully with the letter and spirit of the laws, rules and ethical principles that govern us. Our continued success depends upon unswerving adherence to this standard.

**Our goal is to provide superior returns to our shareholders.**
Profitability is critical to achieving superior returns, building our capital, and attracting and keeping our best people. Significant employee stock ownership aligns the interests of our employees and our shareholders.

**We take great pride in the professional quality of our work.**
We have an uncompromising determination to achieve excellence in everything we undertake. Though we may be involved in a wide variety and heavy volume of activity, we would, if it came to a choice, rather be best than biggest.

**We stress creativity and imagination in everything we do.**
While recognizing that the old way may still be the best way, we constantly strive to find a better solution to a client's problems. We pride ourselves on having pioneered many of the practices and techniques that have become standard in the industry.

**We make an unusual effort to identify and recruit the very best person for every job.**
Although our activities are measured in billions of dollars, we select our people one by one. In a service business, we know that without the best people, we cannot be the best firm.

**We offer our people the opportunity to move ahead more rapidly than is possible at most other places.**
Advancement depends on merit and we have yet to find the limits to the responsibility our best people are able to assume. For us to be successful, our men and women must reflect the diversity of the communities and cultures in which we operate. That means we must attract, retain and motivate people from many backgrounds and perspectives. Being diverse is not optional; it is what we must be.

**We stress teamwork in everything we do.**
While individual creativity is always encouraged, we have found that team effort often produces the best results. We have no room for those who put their personal interests ahead of the interests of the firm and its clients.

**The dedication of our people to the firm and the intense effort they give their jobs are greater than one finds in most other organizations.**
We think that this is an important part of our success.

**We consider our size an asset that we try hard to preserve.**
We want to be big enough to undertake the largest project that any of our clients could contemplate, yet small enough to maintain the loyalty, the intimacy and the esprit de corps that we all treasure and that contribute greatly to our success.

**We constantly strive to anticipate the rapidly changing needs of our clients and to develop new services to meet those needs.**
We know that the world of finance will not stand still and that complacency can lead to extinction.

**We regularly receive confidential information as part of our normal client relationships.**
To breach a confidence or to use confidential information improperly or carelessly would be unthinkable.

**Our business is highly competitive, and we aggressively seek to expand our client relationships.**
However, we must always be fair competitors and must never denigrate other firms.

**Integrity and honesty are at the heart of our business.**
We expect our people to maintain high ethical standards in everything they do, both in their work for the firm and in their personal lives.

# UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

# Form 10-K

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

For the fiscal year ended December 31, 2018 Commission File Number: 001-14965

# The Goldman Sachs Group, Inc.

(Exact name of registrant as specified in its charter)

| | |
|---|---|
| Delaware<br>(State or other jurisdiction of incorporation or organization) | 13-4019460<br>(I.R.S. Employer Identification No.) |
| 200 West Street<br>New York, N.Y.<br>(Address of principal executive offices) | 10282<br>(Zip Code) |

(212) 902-1000
(Registrant's telephone number, including area code)

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

| Title of each class: | Name of each exchange on which registered: |
|---|---|
| **Common stock, par value $.01 per share** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of Floating Rate Non-Cumulative Preferred Stock, Series A** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of 6.20% Non-Cumulative Preferred Stock, Series B** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of Floating Rate Non-Cumulative Preferred Stock, Series C** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of Floating Rate Non-Cumulative Preferred Stock, Series D** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of 5.50% Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series J** | **New York Stock Exchange** |
| **Depositary Shares, Each Representing 1/1,000th Interest in a Share of 6.375% Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series K** | **New York Stock Exchange** |
| **Depository Shares, Each Representing 1/1,000th Interest in a Share of 6.30% Non-Cumulative Preferred Stock, Series N** | **New York Stock Exchange** |
| **See Exhibit 99.2 for debt and trust securities registered under Section 12(b) of the Act** | |

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 15(d) of the Act. ☐ Yes ☒ No

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

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

Indicate by check mark 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 Exchange Act). ☐ Yes ☒ No

As of June 30, 2018, the aggregate market value of the common stock of the registrant held by non-affiliates of the registrant was approximately $82.2 billion.

As of February 8, 2019, there were 368,272,261 shares of the registrant's common stock outstanding.

**Documents incorporated by reference**: Portions of The Goldman Sachs Group, Inc.'s Proxy Statement for its 2019 Annual Meeting of Shareholders are incorporated by reference in the Annual Report on Form 10-K in response to Part III, Items 10, 11, 12, 13 and 14.

# INDEX


| Form 10-K Item Number | Page No. |
|---|---|
| **PART I** | **1** |
| **Item 1** | |
| **Business** | **1** |
| Introduction | 1 |
| Our Business Segments | 1 |
| Investment Banking | 1 |
| Institutional Client Services | 2 |
| Investing & Lending | 4 |
| Investment Management | 4 |
| Business Continuity and Information Security | 5 |
| Employees | 5 |
| Competition | 5 |
| Regulation | 6 |
| Executive Officers of The Goldman Sachs Group, Inc. | 20 |
| Available Information | 20 |
| Cautionary Statement Pursuant to the U.S. Private Securities Litigation Reform Act of 1995 | 21 |
| **Item 1A** | |
| **Risk Factors** | **22** |
| **Item 1B** | |
| **Unresolved Staff Comments** | **43** |
| **Item 2** | |
| **Properties** | **43** |
| **Item 3** | |
| **Legal Proceedings** | **44** |
| **Item 4** | |
| **Mine Safety Disclosures** | **44** |
| **PART II** | **44** |
| **Item 5** | |
| **Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities** | **44** |
| **Item 6** | |
| **Selected Financial Data** | **44** |

| | Page No. |
|---|---|
| **Item 7** | |
| **Management's Discussion and Analysis of Financial Condition and Results of Operations** | **45** |
| Introduction | 45 |
| Executive Overview | 46 |
| Business Environment | 47 |
| Critical Accounting Policies | 48 |
| Recent Accounting Developments | 50 |
| Use of Estimates | 50 |
| Results of Operations | 50 |
| Balance Sheet and Funding Sources | 63 |
| Equity Capital Management and Regulatory Capital | 68 |
| Regulatory Matters and Other Developments | 72 |
| Off-Balance-Sheet Arrangements and Contractual Obligations | 74 |
| Risk Management | 76 |
| Overview and Structure of Risk Management | 76 |
| Liquidity Risk Management | 81 |
| Market Risk Management | 88 |
| Credit Risk Management | 93 |
| Operational Risk Management | 99 |
| Model Risk Management | 101 |
| **Item 7A** | |
| **Quantitative and Qualitative Disclosures About Market Risk** | **102** |

# INDEX


| | Page No. |
|---|---|
| **Item 8** | |
| **Financial Statements and Supplementary Data** | **102** |
| Management's Report on Internal Control over Financial Reporting | 102 |
| Report of Independent Registered Public Accounting Firm | 103 |
| **Consolidated Financial Statements** | **104** |
| Consolidated Statements of Earnings | 104 |
| Consolidated Statements of Comprehensive Income | 104 |
| Consolidated Statements of Financial Condition | 105 |
| Consolidated Statements of Changes in Shareholders' Equity | 106 |
| Consolidated Statements of Cash Flows | 107 |
| **Notes to Consolidated Financial Statements** | **108** |
| Note 1. Description of Business | 108 |
| Note 2. Basis of Presentation | 108 |
| Note 3. Significant Accounting Policies | 109 |
| Note 4. Financial Instruments Owned and Financial Instruments Sold, But Not Yet Purchased | 116 |
| Note 5. Fair Value Measurements | 117 |
| Note 6. Cash Instruments | 118 |
| Note 7. Derivatives and Hedging Activities | 124 |
| Note 8. Fair Value Option | 135 |
| Note 9. Loans Receivable | 140 |
| Note 10. Collateralized Agreements and Financings | 144 |
| Note 11. Securitization Activities | 148 |
| Note 12. Variable Interest Entities | 149 |
| Note 13. Other Assets | 152 |
| Note 14. Deposits | 154 |
| Note 15. Short-Term Borrowings | 155 |
| Note 16. Long-Term Borrowings | 156 |
| Note 17. Other Liabilities | 158 |
| Note 18. Commitments, Contingencies and Guarantees | 158 |
| Note 19. Shareholders' Equity | 162 |
| Note 20. Regulation and Capital Adequacy | 165 |
| Note 21. Earnings Per Common Share | 172 |
| Note 22. Transactions with Affiliated Funds | 172 |
| Note 23. Interest Income and Interest Expense | 173 |

| | Page No. |
|---|---|
| Note 24. Income Taxes | 173 |
| Note 25. Business Segments | 176 |
| Note 26. Credit Concentrations | 178 |
| Note 27. Legal Proceedings | 179 |
| Note 28. Employee Benefit Plans | 186 |
| Note 29. Employee Incentive Plans | 186 |
| Note 30. Parent Company | 188 |
| **Supplemental Financial Information** | **190** |
| Quarterly Results | 190 |
| Common Stock Performance | 190 |
| Selected Financial Data | 191 |
| Statistical Disclosures | 191 |
| **Item 9** | |
| **Changes in and Disagreements with Accountants on Accounting and Financial Disclosure** | **196** |
| **Item 9A** | |
| **Controls and Procedures** | **196** |
| **Item 9B** | |
| **Other Information** | **196** |
| **PART III** | **196** |
| **Item 10** | |
| **Directors, Executive Officers and Corporate Governance** | **196** |
| **Item 11** | |
| **Executive Compensation** | **196** |
| **Item 12** | |
| **Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters** | **196** |
| **Item 13** | |
| **Certain Relationships and Related Transactions, and Director Independence** | **197** |
| **Item 14** | |
| **Principal Accounting Fees and Services** | **197** |
| **PART IV** | **197** |
| **Item 15** | |
| **Exhibits, Financial Statement Schedules** | **197** |
| **SIGNATURES** | **202** |

# PART I

# Item 1. Business

## Introduction

Goldman Sachs is a leading global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals.

When we use the terms "Goldman Sachs," "the firm," "we," "us" and "our," we mean The Goldman Sachs Group, Inc. (Group Inc. or parent company), a Delaware corporation, and its consolidated subsidiaries.

References to "this Form 10-K" are to our Annual Report on Form 10-K for the year ended December 31, 2018. All references to 2018, 2017 and 2016 refer to our years ended, or the dates, as the context requires, December 31, 2018, December 31, 2017 and December 31, 2016, respectively.

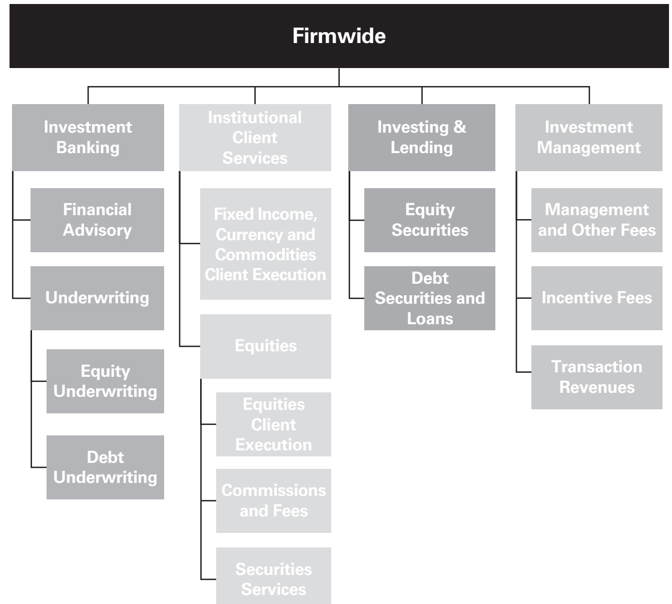
Group Inc. is a bank holding company (BHC) and a financial holding company (FHC) regulated by the Board of Governors of the Federal Reserve System (FRB). Our U.S. depository institution subsidiary, Goldman Sachs Bank USA (GS Bank USA), is a New York State-chartered bank.

As of December 2018, we had offices in over 30 countries and 46% of our headcount was based outside the Americas. Our clients are located worldwide and we are an active participant in financial markets around the world.

## Our Business Segments

We report our activities in four business segments: Investment Banking, Institutional Client Services, Investing & Lending and Investment Management.

The chart below presents our four business segments.




### Investment Banking

Investment Banking serves public and private sector clients around the world. We provide financial advisory services and help companies raise capital to strengthen and grow their businesses. We seek to develop and maintain long-term relationships with a diverse global group of institutional clients, including corporates, governments, states and municipalities. Our goal is to deliver to our institutional clients the entire resources of the firm in a seamless fashion, with investment banking serving as the main initial point of contact with Goldman Sachs.

**Financial Advisory.** We are a leader in providing financial advisory services, including strategic advisory assignments with respect to mergers and acquisitions, divestitures, corporate defense activities, restructurings, spin-offs and risk management. In particular, we help clients execute large, complex transactions for which we provide multiple services, including cross-border structuring expertise. Financial Advisory also includes revenues from derivative transactions directly related to these client advisory assignments. We also assist our clients in managing their asset and liability exposures and their capital.

**Underwriting.** The other core activity of Investment Banking is helping companies raise capital to fund their businesses. As a financial intermediary, our job is to match the capital of our investing clients, who aim to grow the savings of millions of people, with the needs of our public and private sector clients, who need financing to generate growth, create jobs and deliver products and services. Our underwriting activities include public offerings and private placements, including local and cross-border transactions and acquisition financing, of a wide range of securities and other financial instruments, including loans. Underwriting also includes revenues from derivative transactions entered into with public and private sector clients in connection with our underwriting activities.

***Equity Underwriting.*** We underwrite common and preferred stock and convertible and exchangeable securities. We regularly receive mandates for large, complex transactions and have held a leading position in worldwide public common stock offerings and worldwide initial public offerings for many years.

***Debt Underwriting.*** We underwrite and originate various types of debt instruments, including investment-grade and high-yield debt, bank loans and bridge loans, including in connection with acquisition financing, and emerging- and growth-market debt, which may be issued by, among others, corporate, sovereign, municipal and agency issuers. In addition, we underwrite and originate structured securities, which include mortgage-related securities and other asset-backed securities.

### Institutional Client Services

Institutional Client Services serves our clients who come to us to buy and sell financial products, raise funding and manage risk. We do this by acting as a market maker and offering market expertise on a global basis. Institutional Client Services makes markets and facilitates client transactions in fixed income, equity, currency and commodity products. In addition, we make markets in and clear client transactions on major stock, options and futures exchanges worldwide.

As a market maker, we provide prices to clients globally across thousands of products in all major asset classes and markets. At times we take the other side of transactions ourselves if a buyer or seller is not readily available and at other times we connect our clients to other parties who want to transact. Our willingness to make markets, commit capital and take risk in a broad range of products is crucial to our client relationships. Market makers provide liquidity and play a critical role in price discovery, which contributes to the overall efficiency of the capital markets.

Our clients are primarily institutions that are professional market participants, including investment entities whose ultimate clients include individual investors investing for their retirement, buying insurance or putting aside surplus cash in a deposit account.

Through our global sales force, we maintain relationships with our clients, receiving orders and distributing investment research, trading ideas, market information and analysis. Much of this connectivity between us and our clients is maintained on technology platforms and operates globally wherever and whenever markets are open for trading.

Institutional Client Services and our other businesses are supported by our Global Investment Research division, which, as of December 2018, provided fundamental research on approximately 3,000 companies worldwide and more than 40 national economies, as well as on industries, currencies and commodities.

Institutional Client Services generates revenues from the following activities:

- In large, highly liquid markets (such as markets for U.S. Treasury bills, large capitalization S&P 500 Index stocks or certain mortgage pass-through securities), we execute a high volume of transactions for our clients;
- In less liquid markets (such as mid-cap corporate bonds, growth market currencies or certain non-agency mortgage-backed securities), we execute transactions for our clients for spreads and fees that are generally somewhat larger than those charged in more liquid markets;
- We also structure and execute transactions involving customized or tailor-made products that address our clients' risk exposures, investment objectives or other complex needs (such as a jet fuel hedge for an airline);
- We provide financing to our clients for their securities trading activities, as well as securities lending and other prime brokerage services; and
- In connection with our market-making activities, we maintain inventory, typically for a short period of time, in response to, or in anticipation of, client demand. We also hold inventory to actively manage our risk exposures that arise from these market-making activities. We carry our inventory at fair value with changes in valuation reflected in net revenues.

Institutional Client Services activities are organized by asset class and include both “cash” and “derivative” instruments. “Cash” refers to trading the underlying instrument (such as a stock, bond or barrel of oil). “Derivative” refers to instruments that derive their value from underlying asset prices, indices, reference rates and other inputs, or a combination of these factors (such as an option, which is the right or obligation to buy or sell a certain bond, stock or other asset on a specified date in the future at a certain price, or an interest rate swap, which is the agreement to convert a fixed rate of interest into a floating rate or vice versa).

**Fixed Income, Currency and Commodities Client Execution.** Includes client execution activities related to making markets in both cash and derivative instruments for interest rate products, credit products, mortgages, currencies and commodities.

- **Interest Rate Products.** Government bonds (including inflation-linked securities) across maturities, other government-backed securities, securities sold under agreements to repurchase (repurchase agreements), and interest rate swaps, options and other derivatives.
- **Credit Products.** Investment-grade corporate securities, high-yield securities, credit derivatives, exchange-traded funds, bank and bridge loans, municipal securities, emerging market and distressed debt, and trade claims.
- **Mortgages.** Commercial mortgage-related securities, loans and derivatives, residential mortgage-related securities, loans and derivatives (including U.S. government agency-issued collateralized mortgage obligations and other securities and loans), and other asset-backed securities, loans and derivatives.
- **Currencies.** Currency options, spot/forwards and other derivatives on G-10 currencies and emerging-market products.
- **Commodities.** Commodity derivatives and, to a lesser extent, physical commodities, involving crude oil and petroleum products, natural gas, base, precious and other metals, electricity, coal, agricultural and other commodity products.

**Equities.** Includes equities client execution, commissions and fees, and securities services.

***Equities Client Execution.*** We make markets in equity securities and equity-related products, including exchange-traded funds, convertible securities, options, futures and over-the-counter (OTC) derivative instruments, on a global basis. As a principal, we facilitate client transactions by providing liquidity to our clients, including with large blocks of stocks or derivatives, requiring the commitment of our capital.

We also structure and make markets in derivatives on indices, industry groups, financial measures and individual company stocks. We develop strategies and provide information about portfolio hedging and restructuring and asset allocation transactions for our clients. We also work with our clients to create specially tailored instruments to enable sophisticated investors to establish or liquidate investment positions or undertake hedging strategies. We are one of the leading participants in the trading and development of equity derivative instruments.

Our exchange-based market-making activities include making markets in stocks and exchange-traded funds, futures and options on major exchanges worldwide.

***Commissions and Fees.*** We generate commissions and fees from executing and clearing institutional client transactions on major stock, options and futures exchanges worldwide, as well as OTC transactions. We provide our clients with access to a broad spectrum of equity execution services, including electronic “low-touch” access and more complex “high-touch” execution through both traditional and electronic platforms.

***Securities Services.*** Includes financing, securities lending and other prime brokerage services.

- **Financing Services.** We provide financing to our clients for their securities trading activities through margin loans that are collateralized by securities, cash or other acceptable collateral. We earn a spread equal to the difference between the amount we pay for funds and the amount we receive from our client.
- **Securities Lending Services.** We provide services that principally involve borrowing and lending securities to cover institutional clients’ short sales and borrowing securities to cover our short sales and otherwise to make deliveries into the market. In addition, we are an active participant in broker-to-broker securities lending and third-party agency lending activities.
- **Other Prime Brokerage Services.** We earn fees by providing clearing, settlement and custody services globally. In addition, we provide our hedge fund and other clients with a technology platform and reporting which enables them to monitor their security portfolios and manage risk exposures.

### Investing & Lending

Our investing and lending activities, which are typically longer-term, include activities across various asset classes, primarily debt securities and loans, public and private equity securities, infrastructure and real estate. These activities include making investments, some of which are consolidated, through our Merchant Banking business and our Special Situations Group. Some of these investments are made indirectly through funds that we manage. We also provide financing to corporate clients and individuals, including bank loans, personal loans and mortgages.

**Equity Securities.** We make corporate, real estate, infrastructure and other equity-related investments.

**Debt Securities and Loans.** We make corporate, real estate, infrastructure and other debt investments. In addition, we provide financing to clients through loan facilities and through secured loans, including secured loans through our digital platform, *Goldman Sachs Private Bank Select*. We also make unsecured loans and accept deposits through our digital platform, *Marcus: by Goldman Sachs*.

### Investment Management

Investment Management provides investment and wealth advisory services to help clients preserve and grow their financial assets. We provide these services to our institutional and high-net-worth individual clients, as well as investors who primarily access our products through a network of third-party distributors around the world.

We manage client assets across a broad range of investment strategies and asset classes, including equity, fixed income and alternative investments. Alternative investments primarily includes hedge funds, credit funds, private equity, real estate, currencies, commodities and asset allocation strategies. Our investment offerings include those managed on a fiduciary basis by our portfolio managers, as well as strategies managed by third-party managers. We offer our investments in a variety of structures, including separately managed accounts, mutual funds, private partnerships and other commingled vehicles.

We also provide customized investment advisory solutions designed to address our clients' investment needs. These solutions begin with identifying clients' objectives and continue through portfolio construction, ongoing asset allocation and risk management and investment realization. We draw from a variety of third-party managers, as well as our proprietary offerings to implement solutions for clients.

We supplement our investment advisory solutions for high-net-worth individuals with wealth advisory services that include income and liability management, trust and estate planning, philanthropic giving and tax planning. We also use our global securities and derivatives market-making capabilities to address clients' specific investment needs.

**Management and Other Fees.** The majority of revenues in management and other fees consists of asset-based fees on client assets. The fees that we charge vary by asset class, distribution channel and the type of services provided, and are affected by investment performance, as well as asset inflows and redemptions. Other fees we receive primarily include financial planning and counseling fees generated through wealth advisory services provided by our subsidiary, The Ayco Company, L.P.

Assets under supervision include client assets where we earn a fee for managing assets on a discretionary basis. This includes net assets in our mutual funds, hedge funds, credit funds and private equity funds (including real estate funds), and separately managed accounts for institutional and individual investors. Assets under supervision also include client assets invested with third-party managers, bank deposits and advisory relationships where we earn a fee for advisory and other services, but do not have investment discretion. Assets under supervision do not include the self-directed brokerage assets of our clients. Long-term assets under supervision represent assets under supervision excluding liquidity products. Liquidity products represent money market and bank deposit assets.

**Incentive Fees.** In certain circumstances, we are also entitled to receive incentive fees based on a percentage of a fund's or a separately managed account's return, or when the return exceeds a specified benchmark or other performance targets. Such fees include overrides, which consist of the increased share of the income and gains derived primarily from our private equity and credit funds when the return on a fund's investments over the life of the fund exceeds certain threshold returns.

**Transaction Revenues.** We receive commissions and net spreads for facilitating transactional activity in high-net-worth individual accounts. In addition, we earn net interest income primarily associated with client deposits and margin lending activity undertaken by such clients.

## Business Continuity and Information Security

Business continuity and information security, including cyber security, are high priorities for Goldman Sachs. Their importance has been highlighted by numerous highly publicized events in recent years, including (i) cyber attacks against financial institutions, governmental agencies, large consumer-based companies and other organizations that resulted in the unauthorized disclosure of personal information of clients and customers and other sensitive or confidential information, the theft and destruction of corporate information and requests for ransom payments, and (ii) extreme weather events.

Our Business Continuity & Technology Resilience Program has been developed to provide reasonable assurance of business continuity in the event of disruptions at our critical facilities or systems and to comply with regulatory requirements, including those of FINRA. Because we are a BHC, our Business Continuity & Technology Resilience Program is also subject to review by the FRB. The key elements of the program are crisis management, business continuity, technology resilience, business recovery, assurance and verification, and process improvement. In the area of information security, we have developed and implemented a framework of principles, policies and technology designed to protect the information provided to us by our clients and our own information from cyber attacks and other misappropriation, corruption or loss. Safeguards are designed to maintain the confidentiality, integrity and availability of information.

## Employees

Management believes that a major strength and principal reason for the success of Goldman Sachs is the quality and dedication of our people and the shared sense of being part of a team. We strive to maintain a work environment that fosters professionalism, excellence, diversity, cooperation among our employees worldwide and high standards of business ethics.

Instilling the Goldman Sachs culture in all employees is a continuous process, in which training plays an important part. All employees are offered the opportunity to participate in education and periodic seminars that we sponsor at various locations throughout the world. Another important part of instilling the Goldman Sachs culture is our employee review process. Employees are reviewed by supervisors, co-workers and employees they supervise in a 360-degree review process that is integral to our team approach, and which includes an evaluation of an employee's performance with respect to risk management, compliance and diversity. As of December 2018, we had headcount of 36,600.

## Competition

The financial services industry and all of our businesses are intensely competitive, and we expect them to remain so. Our competitors are other entities that provide investment banking, market-making and investment management services, and commercial and/or consumer lending and deposit-taking products, as well as those entities that make investments in securities, commodities, derivatives, real estate, loans and other financial assets. These entities include brokers and dealers, investment banking firms, commercial banks, insurance companies, investment advisers, mutual funds, hedge funds, private equity funds, merchant banks, consumer finance companies and financial technology and other internet-based companies. We compete with some entities globally and with others on a regional, product or niche basis. We compete based on a number of factors, including transaction execution, products and services, innovation, reputation and price.

We have faced, and expect to continue to face, pressure to retain market share by committing capital to businesses or transactions on terms that offer returns that may not be commensurate with their risks. In particular, corporate clients seek such commitments (such as agreements to participate in their loan facilities) from financial services firms in connection with investment banking and other assignments.

Consolidation and convergence have significantly increased the capital base and geographic reach of some of our competitors, and have also hastened the globalization of the securities and other financial services markets. As a result, we have had to commit capital to support our international operations and to execute large global transactions. To take advantage of some of our most significant opportunities, we will have to compete successfully with financial institutions that are larger and have more capital and that may have a stronger local presence and longer operating history outside the U.S.

We also compete with smaller institutions that offer more targeted services, such as independent advisory firms. Some clients may perceive these firms to be less susceptible to potential conflicts of interest than we are, and, as described below, our ability to effectively compete with them could be affected by regulations and limitations on activities that apply to us but may not apply to them.

A number of our businesses are subject to intense price competition. Efforts by our competitors to gain market share have resulted in pricing pressure in our investment banking and market-making businesses, and could result in pricing pressure in other of our businesses. For example, the increasing volume of trades executed electronically, through the internet and through alternative trading systems, has increased the pressure on trading commissions, in that commissions for electronic trading are generally lower than for non-electronic trading. It appears that this trend toward low-commission trading will continue. Price competition has also led to compression in the difference between the price at which a market participant is willing to sell an instrument and the price at which another market participant is willing to buy it (i.e., bid/offer spread), which has affected our market-making businesses. In addition, we believe that we will continue to experience competitive pressures in these and other areas in the future as some of our competitors seek to obtain market share by further reducing prices, and as we enter into or expand our presence in markets that may rely more heavily on electronic trading and execution.

We also compete on the basis of the types of financial products that we and our competitors offer. In some circumstances, our competitors may offer financial products that we do not offer and that our clients may prefer.

The provisions of the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act), the requirements promulgated by the Basel Committee on Banking Supervision (Basel Committee) and other financial regulation could affect our competitive position to the extent that limitations on activities, increased fees and compliance costs or other regulatory requirements do not apply, or do not apply equally, to all of our competitors or are not implemented uniformly across different jurisdictions. For example, the provisions of the Dodd-Frank Act that prohibit proprietary trading and restrict investments in certain hedge and private equity funds differentiate between U.S.-based and non-U.S.-based banking organizations and give non-U.S.-based banking organizations greater flexibility to trade outside of the U.S. and to form and invest in funds outside the U.S.

Likewise, the obligations with respect to derivative transactions under Title VII of the Dodd-Frank Act depend, in part, on the location of the counterparties to the transaction. The impact of the Dodd-Frank Act and other regulatory developments on our competitive position will depend to a large extent on the manner in which the required rulemaking and regulatory guidance evolve, the extent of international convergence, and the development of market practice and structures under the new regulatory regimes as described further in "Regulation" below.

We also face intense competition in attracting and retaining qualified employees. Our ability to continue to compete effectively will depend upon our ability to attract new employees, retain and motivate our existing employees and to continue to compensate employees competitively amid intense public and regulatory scrutiny on the compensation practices of large financial institutions. Our pay practices and those of certain of our competitors are subject to review by, and the standards of, the FRB and other regulators inside and outside the U.S., including the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) in the U.K. We also compete for employees with institutions whose pay practices are not subject to regulatory oversight. See "Regulation — Compensation Practices" and "Risk Factors — Our businesses may be adversely affected if we are unable to hire and retain qualified employees" in Part I, Item 1A of this Form 10-K for further information about such regulation.

## Regulation

As a participant in the global financial services industry, we are subject to extensive regulation and supervision worldwide. The Dodd-Frank Act, and the rules thereunder, significantly altered the U.S. financial regulatory regime within which we operate and the Markets in Financial Instruments Regulation and Markets in Financial Instruments Directive (collectively, MiFID II) have significantly revised the regulatory regime for our European operations. The Basel Committee's framework for strengthening the regulation, supervision and risk management of banks (Basel III), is implemented by the FRB, the PRA and other national regulators. The Basel Committee is the primary global standard setter for prudential bank regulation. However, its standards are not effective in any jurisdiction until rules implementing such standards have been implemented by the relevant regulators. The implications of such regulations for our businesses depend to a large extent on their implementation by the relevant regulators globally, and the market practices and structures that develop.

In 2017 and 2018, the U.S. Department of the Treasury, in response to an executive order issued by the President of the U.S., issued four reports recommending a number of comprehensive changes to the regulatory systems applicable in the U.S. to banks and other financial institutions.

Other reforms have been adopted or are being considered by regulators and policy makers worldwide, as described below. Recent developments have added additional uncertainty to the implementation, scope and timing of regulatory reforms and potential for deregulation in some areas. The effects of any changes to the regulations affecting our businesses, including as a result of the proposals described below, are uncertain and will not be known until the changes are finalized and market practices and structures develop under the revised regulations.

Goldman Sachs International (GSI), Goldman Sachs International Bank (GSIB) and Goldman Sachs Asset Management International (GSAMI), our principal E.U. operating subsidiaries, are incorporated and headquartered in the U.K. and, as such, are currently subject to E.U. legal and regulatory requirements, based on directly binding regulations of the E.U. and the implementation of E.U. directives by the U.K. They all currently benefit from non-discriminatory access to E.U. clients and infrastructure based on E.U. treaties and E.U. legislation, including cross-border "passporting" arrangements and specific arrangements for the establishment of E.U. branches. As a result of the U.K.'s notification to the European Council of its decision to leave the E.U. (Brexit), there is considerable uncertainty as to the regulatory regime that will be applicable in the U.K. and the regulatory framework that will govern transactions and business undertaken by our U.K. subsidiaries in the remaining E.U. countries. The U.K.'s European Union (Withdrawal) Act 2018 aims to preserve the direct and operative E.U. law governing the requirements on U.K. financial service providers as English law beginning March 29, 2019. References to E.U. regulations that are in effect in the U.K. as of March 29, 2019 may apply to our U.K. subsidiaries following Brexit. In addition, proposals by the Basel Committee or the E.U. may be implemented in the U.K. and apply to our U.K. subsidiaries.

Pursuant to an agreement endorsed by the E.U. and U.K. leaders in November (Withdrawal Agreement), the existing access arrangements for financial services would continue unchanged until the end of 2020, with potential for one further extension of up to two years, subsequent to which a new trade relationship may be established between the E.U. and the U.K. While the parties have issued a political declaration on the outline of such co-operation, the exact terms of that future relationship, including the exact terms of access to each other's financial markets remain subject to future negotiation. If the Withdrawal Agreement is not ratified, beginning March 29, 2019, the date on which the U.K. is scheduled to leave the E.U., firms established in the U.K., including our U.K. subsidiaries, would lose their pan-E.U. "passports" and generally be treated like entities in countries outside the E.U. They may, however, benefit from emergency measures, including those that several E.U. member states have introduced so that existing contractual arrangements are not disrupted, in order to minimize any impact on existing transactions. The E.U. has also provided interim recognition to U.K. clearing houses so that E.U. clients can continue to access them.

**Banking Supervision and Regulation**

Group Inc. is a BHC under the U.S. Bank Holding Company Act of 1956 (BHC Act) and an FHC under amendments to the BHC Act effected by the U.S. Gramm-Leach-Bliley Act of 1999 (GLB Act), and is subject to supervision and examination by the FRB, which is our primary regulator.

Under the system of "functional regulation" established under the BHC Act, the primary regulators of our U.S. non-bank subsidiaries directly regulate the activities of those subsidiaries, with the FRB exercising a supervisory role. Such "functionally regulated" subsidiaries include broker-dealers registered with the SEC, such as our principal U.S. broker-dealer, Goldman Sachs & Co. LLC (GS&Co.), entities registered with or regulated by the CFTC with respect to futures-related and swaps-related activities and investment advisers registered with the SEC with respect to their investment advisory activities.

In November 2018, the FRB issued a final rule establishing a new rating system for large financial institutions, such as us. The new rating system is intended to align with the FRB's existing supervisory program for large financial institutions and includes component ratings for capital planning, liquidity risk management, and governance and controls. The FRB has also proposed related guidance for the governance and controls component.

Our principal U.S. bank subsidiary, GS Bank USA, is supervised and regulated by the FRB, the FDIC, the New York State Department of Financial Services (NYDFS) and the Bureau of Consumer Financial Protection. A number of our activities are conducted partially or entirely through GS Bank USA and its subsidiaries, including: origination of bank loans; personal loans and mortgages; interest rate, credit, currency and other derivatives; leveraged finance; deposit-taking; and agency lending. Our consumer-oriented activities are subject to extensive regulation and supervision by federal and state regulators with regard to consumer protection laws, including laws relating to fair lending and other practices in connection with marketing and providing consumer financial products.

Certain of our subsidiaries are regulated by the banking and securities regulatory authorities of the countries in which they operate. As described below, our E.U. subsidiaries, including our U.K. subsidiaries, are subject to various European regulations, as well as national laws, which to some extent implement European directives.

GSI, our U.K. broker-dealer subsidiary and a designated investment firm, and GSIB, our U.K. bank subsidiary, are regulated by the PRA and the FCA. GSI provides broker-dealer services in and from the U.K., and GSIB acts as a primary dealer for European government bonds and is involved in market making in European government bonds, lending (including securities lending) and deposit-taking activities. GSIB's consumer-oriented deposit-taking activities are subject to U.K. consumer protection regulations. Goldman Sachs Bank Europe SE ("GSBE," formerly Goldman Sachs AG), our German bank subsidiary, is regulated by the BaFin and Deutsche Bundesbank within the context of the European Single Supervisory Mechanism. In addition, in December 2018, our German subsidiary, Goldman Sachs Europe SE, was approved by BaFin as an authorized investment firm, which will allow it to conduct certain activities (such as activities related to physical commodities) which GSBE may be prevented from undertaking.

**Capital and Liquidity Requirements.** We and GS Bank USA are subject to regulatory risk-based capital and leverage requirements that are calculated in accordance with the regulations of the FRB (Capital Framework). The Capital Framework is largely based on Basel III and also implements certain provisions of the Dodd-Frank Act. Under the Capital Framework, we and GS Bank USA are "Advanced approach" banking organizations. We have also been designated as a global systemically important bank (G-SIB). Under the FRB's capital adequacy requirements, we and GS Bank USA must meet specific regulatory capital requirements that involve quantitative measures of assets, liabilities and certain off-balance-sheet items. The sufficiency of our capital levels is also subject to qualitative judgments by regulators. We and GS Bank USA are also subject to liquidity requirements established by the U.S. federal bank regulatory agencies.

In October 2018, the FRB released two proposals that would generally make the applicable capital and liquidity requirements less stringent for large U.S. banking organizations other than those that are U.S. G-SIBs, such as us.

GSI and GSIB are subject to capital requirements prescribed in the E.U. Capital Requirements Regulation (CRR) and the E.U. Fourth Capital Requirements Directive (CRD IV). GSI and GSIB are subject to liquidity requirements established by U.K. regulatory authorities that are similar to those applicable to GS Bank USA and us.

***Risk-Based Capital Ratios.*** The Capital Framework provides for an additional capital ratio requirement that consists of three components: (i) for capital conservation (capital conservation buffer), (ii) for countercyclicality (countercyclical capital buffer) and (iii) as a consequence of our designation as a G-SIB (G-SIB buffer). The additional capital ratio requirement must be satisfied entirely with capital that qualifies as Common Equity Tier 1 (CET1). GS Bank USA is subject to the first two components of the additional capital ratio requirement discussed above.

The capital conservation buffer and G-SIB buffer began to phase in on January 1, 2016 and continued to do so through January 1, 2019. In April 2018, the FRB proposed a rule that would, among other things, replace the capital conservation buffer with a stress capital buffer (SCB) requirement for large BHCs subject to the FRB's Comprehensive Capital Analysis and Review (CCAR). See "Regulation — Banking Supervision and Regulation — Stress Tests" for further information about this proposed rule.

The countercyclical capital buffer is designed to counteract systemic vulnerabilities and currently applies only to "Advanced approach" banking organizations. Several other national supervisors also require countercyclical capital buffers. The G-SIB and countercyclical capital buffers applicable to us could change in the future and, as a result, the minimum capital ratios to which we are subject could change.

In December 2018, the U.S. federal bank regulatory agencies issued a final rule that would provide an optional three-year phase-in period for the day-one regulatory capital effects of the adoption of the Current Expected Credit Losses (CECL) accounting standard. The FRB also released a statement indicating that it will not incorporate CECL into the calculation of the allowance for credit losses in supervisory stress tests through the 2021 stress test cycle. See Note 3 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for further information about CECL.

In October 2018, the U.S. federal bank regulatory agencies issued a proposed rule that would implement the Basel Committee's standardized approach for measuring counterparty credit risk exposures in connection with derivative contracts (SA-CCR). Under the proposal, "Advanced approach" banking organizations would be required to use SA-CCR for purposes of calculating their standardized risk-weighted assets (RWAs) and, with some adjustments, for purposes of determining their supplementary leverage ratios (SLRs) discussed below.

The Basel Committee has published final guidelines for calculating incremental capital ratio requirements for banking institutions that are systemically significant from a domestic but not global perspective (D-SIBs). If these guidelines are implemented by national regulators, they will apply, among others, to certain subsidiaries of G-SIBs. These guidelines are in addition to the framework for G-SIBs, but are more principles-based. CRD IV and the CRR provide that institutions that are systemically important at the E.U. or member state level, known as other systemically important institutions (O-SIIs), may be subject to additional capital ratio requirements of up to 2% of CET1, according to their degree of systemic importance (O-SII buffers). O-SIIs are identified annually, along with their applicable buffers. The PRA has identified Goldman Sachs Group UK Limited (GSG UK), the parent company of GSI and GSIB, as an O-SII. GSG UK's O-SII buffer is currently set at zero percent.

In January 2019, the Basel Committee finalized revisions to the framework for calculating capital requirements for market risk, which is expected to increase market risk capital requirements for most banking organizations, although to a lesser degree than the version of the framework issued in January 2016. The revised framework, among other things, revises the standardized approach and internal models to calculate market risk requirements and clarifies the scope of positions subject to market risk capital requirements. The Basel Committee has proposed that national regulators implement the revised framework beginning January 1, 2022. The U.S. federal bank regulatory agencies and the European Commission have not yet proposed rules implementing the 2019 version of the revised market risk framework for the U.S. and E.U. financial institutions, respectively.

In December 2017, the Basel Committee published standards that it described as the finalization of the Basel III post-crisis regulatory reforms. These standards set a floor on internally modeled capital requirements at a percentage of the capital requirements under the standardized approach. They also revise the Basel Committee's standardized and model-based approaches for credit risk, provide a new standardized approach for operational risk capital and revise the frameworks for credit valuation adjustment risk. The Basel Committee has proposed that national regulators implement these standards beginning January 1, 2022, and that the new floor be phased in through January 1, 2027.

The Basel Committee has also published updated frameworks relating to Pillar 3 disclosure requirements and the regulatory capital treatment of securitization exposures and a revised G-SIB assessment methodology. The U.S. federal bank regulatory agencies have not yet proposed rules implementing the December 2017 standards for purposes of risk-based capital ratios or the Basel Committee frameworks.

See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Equity Capital Management and Regulatory Capital" in Part II, Item 7 of this Form 10-K and Note 20 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for information about the capital ratios of the firm, GS Bank USA and GSI.

As described in "Other Restrictions" below, in September 2016, the FRB issued a proposed rule that would, among other things, require FHCs to hold additional capital in connection with covered physical commodity activities.

***Leverage Ratios.*** Under the Capital Framework, we and GS Bank USA are subject to Tier 1 leverage ratios and SLRs established by the FRB. In April 2018, the FRB and the Office of the Comptroller of the Currency (OCC) issued a proposed rule which would replace the current 2% SLR buffer for G-SIBs, including us, with a buffer equal to 50% of their G-SIB buffer. This proposal and the proposal to use SA-CCR for purposes of calculating the SLR would implement certain of the revisions to the leverage ratio framework published by the Basel Committee in December 2017.

The Basel Committee has also issued consultation papers on, among other matters, changes to leverage ratio treatment of client cleared derivatives and the public disclosure of daily average balances for certain components of leverage ratio calculations.

The European Commission's November 2016 proposal to amend the CRR would implement the Basel III leverage ratio framework by establishing a 3% minimum leverage ratio requirement for certain E.U. financial institutions, including GSI and GSIB, but it has not been enacted.

See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Equity Capital Management and Regulatory Capital" in Part II, Item 7 of this Form 10-K and Note 20 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for information about our and GS Bank USA's Tier 1 leverage ratios and SLRs, and GSI's leverage ratio.

***Liquidity Ratios.*** The Basel Committee's framework for liquidity risk measurement, standards and monitoring requires banking organizations to measure their liquidity against two specific liquidity tests: the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR).

The LCR rule issued by the U.S. federal bank regulatory agencies and applicable to both us and GS Bank USA is generally consistent with the Basel Committee's framework and is designed to ensure that a banking organization maintains an adequate level of unencumbered, high-quality liquid assets equal to or greater than the expected net cash outflows under an acute short-term liquidity stress scenario. The LCR rule issued by the European Commission and applicable to GSI and GSIB is also generally consistent with the Basel Committee's framework. We are required to maintain a minimum LCR of 100%. We disclose, on a quarterly basis, our average daily LCR over the quarter. See "Available Information."

The NSFR is designed to promote medium- and long-term stable funding of the assets and off-balance-sheet activities of banking organizations over a one-year time horizon. The Basel Committee's NSFR framework requires banking organizations to maintain a minimum NSFR of 100%.

In May 2016, the U.S. federal bank regulatory agencies issued a proposed rule that would implement the NSFR for large U.S. banking organizations, including us and GS Bank USA. The European Commission's November 2016 proposal to amend the CRR would implement the NSFR for certain E.U. financial institutions. Neither the U.S. federal bank regulatory agencies nor the European Commission have released a final rule.

The FRB's enhanced prudential standards require BHCs, including Group Inc., with $100 billion or more in total consolidated assets, to comply with enhanced liquidity and overall risk management standards, which include maintaining a level of highly liquid assets based on projected funding needs for 30 days, and increased involvement by boards of directors in liquidity and overall risk management. Although the liquidity requirement under these rules has some similarities to the LCR, it is a separate requirement.

See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Risk Management — Overview and Structure of Risk Management" and "— Liquidity Risk Management" in Part II, Item 7 of this Form 10-K for information about the LCR and NSFR, as well as our risk management practices and liquidity.

**Stress Tests.** As required by the FRB's annual CCAR rules, we submit a capital plan for review by the FRB. In addition, we are required to perform company-run stress tests on a semi-annual basis, although the FRB has recently proposed to reduce the required frequency of these tests to annually. We publish summaries of our stress tests results on our website as described in "Available Information" below.

Our annual stress test submission is incorporated into the annual capital plans that we submit to the FRB as part of the CCAR process for large BHCs, which is designed to ensure that capital planning processes will permit continued operations by such institutions during times of economic and financial stress. As part of CCAR, the FRB evaluates an institution's plan to make capital distributions, such as by repurchasing or redeeming stock or making dividend payments, across a range of macroeconomic and firm-specific assumptions based on the institution's and the FRB's stress tests. If the FRB objects to an institution's capital plan, the institution is generally prohibited from making capital distributions other than those to which the FRB has not objected. In addition, an institution faces limitations on capital distributions to the extent that actual capital issuances are less than the amounts indicated in its capital plan.

In April 2018, the FRB issued a proposed rule to establish stress buffer requirements. Under the proposal, the SCB would replace the component of the capital conservation buffer. The SCB, subject to a minimum, would reflect stressed losses in the supervisory severely adverse scenario of the FRB's CCAR stress tests and would also include four quarters of planned common stock dividends. The proposal would also introduce a stress leverage buffer requirement, similar to the SCB, which would apply to the Tier 1 leverage ratio. In addition, the proposal would require BHCs to reduce their planned capital distributions if those distributions would not be consistent with the applicable capital buffer constraints based on the BHCs' own baseline scenario projections.

Under recent amendments to the Dodd-Frank Act, effective November 2019, depository institutions with total consolidated assets between $100 billion and $250 billion, such as GS Bank USA, will not be required to conduct annual company-run stress tests. GS Bank USA will not be required to conduct the annual company-run stress test in 2019. GSI and GSIB also have their own capital planning and stress testing process, which incorporates internally designed stress tests and those required under the PRA's Internal Capital Adequacy Assessment Process.

**Dividends and Stock Repurchases.** Dividend payments by Group Inc. to its shareholders and stock repurchases by Group Inc. are subject to the oversight of the FRB.

U.S. federal and state laws impose limitations on the payment of dividends by U.S. depository institutions, such as GS Bank USA. In general, the amount of dividends that may be paid by GS Bank USA is limited to the lesser of the amounts calculated under a "recent earnings" test and an "undivided profits" test. Under the recent earnings test, a dividend may not be paid if the total of all dividends declared by the entity in any calendar year is in excess of the current year's net income combined with the retained net income of the two preceding years, unless the entity obtains prior regulatory approval. Under the undivided profits test, a dividend may not be paid in excess of the entity's "undivided profits" (generally, accumulated net profits that have not been paid out as dividends or transferred to surplus).

The applicable U.S. banking regulators have authority to prohibit or limit the payment of dividends if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization.

**Source of Strength.** The Dodd-Frank Act requires BHCs to act as a source of strength to their bank subsidiaries and to commit capital and financial resources to support those subsidiaries. This support may be required by the FRB at times when we might otherwise determine not to provide it. Capital loans by a BHC to a subsidiary bank are subordinate in right of payment to deposits and to certain other indebtedness of the subsidiary bank. In addition, if a BHC commits to a U.S. federal banking agency that it will maintain the capital of its bank subsidiary, whether in response to the FRB's invoking its source-of-strength authority or in response to other regulatory measures, that commitment will be assumed by the bankruptcy trustee for the BHC and the bank will be entitled to priority payment in respect of that commitment, ahead of other creditors of the BHC.

**Transactions between Affiliates.** Transactions between GS Bank USA or its subsidiaries, on the one hand, and Group Inc. or its other subsidiaries and affiliates, on the other hand, are regulated by the FRB. These regulations generally limit the types and amounts of transactions (including credit extensions from GS Bank USA or its subsidiaries to Group Inc. or its other subsidiaries and affiliates) that may take place and generally require those transactions to be on market terms or better to GS Bank USA or its subsidiaries. These regulations generally do not apply to transactions between GS Bank USA and its subsidiaries. The Dodd-Frank Act expanded the coverage and scope of these regulations, including by applying them to the credit exposure arising under derivative transactions, repurchase and reverse repurchase agreements, and securities borrowing and lending transactions.

The BHC Act prohibits the FRB from requiring a payment by a BHC subsidiary to a depository institution if the functional regulator of that subsidiary objects to such payment. In such a case, the FRB could instead require the divestiture of the depository institution and impose operating restrictions pending the divestiture.

**Resolution and Recovery.** Group Inc. is required by the FRB and the FDIC to submit a periodic plan for its rapid and orderly resolution in the event of material financial distress or failure (resolution plan). If the regulators jointly determine that an institution has failed to remediate identified shortcomings in its resolution plan and that its resolution plan, after any permitted resubmission, is not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, the regulators may jointly impose more stringent capital, leverage or liquidity requirements or restrictions on growth, activities or operations or may jointly order the institutions to divest assets or operations in order to facilitate orderly resolution in the event of failure. In December 2018, the FRB and FDIC finalized guidance for resolution plan submissions which consolidated or superseded all prior guidance. See "Risk Factors — The application of Group Inc.'s proposed resolution strategy could result in greater losses for Group Inc.'s security holders" in Part I, Item 1A of this Form 10-K and "Management's Discussion and Analysis of Financial Condition and Results of Operations — Regulatory Matters and Other Developments — Regulatory Matters — Resolution and Recovery Plans" in Part II, Item 7 of this Form 10-K for further information about our resolution plan.

We are also required by the FRB to submit, on a periodic basis, a global recovery plan that outlines the steps that management could take to reduce risk, maintain sufficient liquidity, and conserve capital in times of prolonged stress.

The FDIC has issued a rule requiring each insured depository institution with $50 billion or more in assets, such as GS Bank USA, to provide a resolution plan. Our resolution plan for GS Bank USA must, among other things, demonstrate that it is adequately protected from risks arising from our other entities.

The federal bank regulatory agencies have adopted final rules imposing restrictions on qualified financial contracts (QFCs) entered into by G-SIBs. The rules began to phase in on January 1, 2019 and will be fully effective on January 1, 2020. The rules are intended to facilitate the orderly resolution of a failed G-SIB by limiting the ability of the G-SIB to enter into a QFC unless (i) the counterparty waives certain default rights in such contract arising upon the entry of the G-SIB or one of its affiliates into resolution, (ii) the contract does not contain enumerated prohibitions on the transfer of such contract and/or any related credit enhancement, and (iii) the counterparty agrees that the contract will be subject to the special resolution regimes set forth in the Dodd-Frank Act orderly liquidation authority (OLA) and the Federal Deposit Insurance Act of 1950 (FDIA), described below. Compliance can be achieved by adhering to the ISDA Universal Protocol or U.S. ISDA Protocol described below.

Certain Group Inc. subsidiaries, along with those of a number of other major global banking organizations, adhere to the International Swaps and Derivatives Association Universal Resolution Stay Protocol (ISDA Universal Protocol), which was developed and updated in coordination with the Financial Stability Board (FSB), an international body that sets standards and coordinates the work of national financial authorities and international standard-setting bodies. The ISDA Universal Protocol imposes a stay on certain cross-default and early termination rights within standard ISDA derivative contracts and securities financing transactions between adhering parties in the event that one of them is subject to resolution in its home jurisdiction, including a resolution under the OLA or the FDIA in the U.S. In addition, certain Group Inc. subsidiaries adhere to the International Swaps and Derivatives Association 2018 U.S. Resolution Stay Protocol (U.S. ISDA Protocol), which was based on the ISDA Universal Protocol and was created to allow market participants to comply with the final QFC rules adopted by the federal bank regulatory agencies.

The E.U. Bank Recovery and Resolution Directive (BRRD) establishes a framework for the recovery and resolution of financial institutions in the E.U., such as GSI and GSIB. The BRRD provides national supervisory authorities with tools and powers to pre-emptively address potential financial crises in order to promote financial stability and minimize taxpayers' exposure to losses. The BRRD requires E.U. member states to grant "bail-in" powers to E.U. resolution authorities to recapitalize a failing entity by writing down its unsecured debt or converting its unsecured debt into equity. Financial institutions in the E.U. must provide that contracts enable such actions.

**Total Loss-Absorbing Capacity.** In December 2016, the FRB adopted a final rule establishing loss-absorbency and related requirements for BHCs that have been designated as U.S. G-SIBs, such as Group Inc. The rule became effective in January 2019 with no phase-in period. The rule addresses U.S. implementation of the FSB's total loss-absorbing capacity (TLAC) principles and term sheet on minimum TLAC requirements for G-SIBs (issued in November 2015). The rule (i) establishes minimum TLAC requirements, (ii) establishes minimum "eligible long-term debt" (i.e., debt that is unsecured, has a maturity of at least one year from issuance and satisfies certain additional criteria) requirements, (iii) prohibits certain parent company transactions and (iv) caps the amount of parent company liabilities that are not eligible long-term debt.

The rule also prohibits a BHC that has been designated as a U.S. G-SIB from (i) guaranteeing liabilities of subsidiaries that are subject to early termination provisions if the BHC enters into an insolvency or receivership proceeding, subject to an exception for guarantees permitted by rules of the U.S. federal banking agencies imposing restrictions on QFCs; (ii) incurring liabilities guaranteed by subsidiaries; (iii) issuing short-term debt; or (iv) entering into derivatives and certain other financial contracts with external counterparties.

Additionally, the rule caps, at 5% of the value of the parent company's eligible TLAC, the amount of unsecured non-contingent third-party liabilities that are not eligible long-term debt that could rank equally with or junior to eligible long-term debt.

The FSB's final TLAC standard requires certain material subsidiaries of a G-SIB organized outside of the G-SIB's home country, such as GSI and GSIB, to maintain amounts of TLAC directly or indirectly from the parent company. In July 2017, the FSB issued a final set of guiding principles on the implementation of the TLAC requirements applicable to material subsidiaries.

The BRRD subjects institutions to a minimum requirement for own funds and eligible liabilities (MREL), which is generally consistent with the FSB's TLAC standard. In June 2018, the Bank of England published a statement of policy on internal MREL, which requires a material U.K. subsidiary of an overseas banking group, such as GSI, to meet a minimum internal MREL requirement to facilitate the transfer of losses to its resolution entity, which for GSI is Group Inc. The transitional minimum internal MREL requirement began to phase in from January 1, 2019 and will become fully effective on January 1, 2022. In order to comply with the MREL statement of policy, bail-in triggers have been provided to the Bank of England over certain intercompany regulatory capital and senior debt instruments issued by GSI. These triggers enable the Bank of England to write down such instruments or convert such instruments to equity. The triggers can be exercised by the Bank of England if it determines that GSI has reached the point of non-viability and the FRB and the FDIC have not objected to the bail-in or if Group Inc. enters bankruptcy or similar proceedings.

The European Commission's November 2016 proposed amendments to the CRR and the BRRD include provisions that are designed to implement the FSB's minimum TLAC requirement for G-SIBs. The proposal would require subsidiaries of a non-E.U. G-SIB that account for more than 5% of its RWAs, operating income or leverage exposure, such as GSI, to meet 90% of the requirement applicable to E.U. G-SIBs.

In November 2016, the European Commission also proposed to amend CRD IV to require a non-E.U. G-SIB, such as us, to establish an E.U. intermediate holding company (E.U. IHC) if a firm has two or more of certain types of E.U. financial institution subsidiaries, including broker-dealers and banks. The European Commission also proposed amendments to the CRR that would require E.U. IHCs to satisfy MREL requirements and certain other prudential requirements. These proposals are subject to adoption at the E.U. level and, for the directives, implementing rulemakings by E.U. member states, which have not yet occurred.

**Insolvency of an Insured Depository Institution or a Bank Holding Company.** Under the FDIA, if the FDIC is appointed as conservator or receiver for an insured depository institution such as GS Bank USA, upon its insolvency or in certain other events, the FDIC has broad powers, including the power:

- To transfer any of the depository institution's assets and liabilities to a new obligor, including a newly formed "bridge" bank, without the approval of the depository institution's creditors;
- To enforce the depository institution's contracts pursuant to their terms without regard to any provisions triggered by the appointment of the FDIC in that capacity; or
- To repudiate or disaffirm any contract or lease to which the depository institution is a party, the performance of which is determined by the FDIC to be burdensome and the disaffirmance or repudiation of which is determined by the FDIC to promote the orderly administration of the depository institution.

In addition, the claims of holders of domestic deposit liabilities and certain claims for administrative expenses against an insured depository institution would be afforded a priority over other general unsecured claims, including deposits at non-U.S. branches and claims of debtholders of the institution, in the "liquidation or other resolution" of such an institution by any receiver. As a result, whether or not the FDIC ever sought to repudiate any debt obligations of GS Bank USA, the debtholders (other than depositors) would be treated differently from, and could receive, if anything, substantially less than, the depositors of GS Bank USA.

The Dodd-Frank Act created a new resolution regime (known as OLA) for BHCs and their affiliates that are systemically important and certain non-bank financial companies. Under OLA, the FDIC may be appointed as receiver for the systemically important institution and its failed non-bank subsidiaries if, upon the recommendation of applicable regulators, the U.S. Secretary of the Treasury determines, among other things, that the institution is in default or in danger of default, that the institution's failure would have serious adverse effects on the U.S. financial system and that resolution under OLA would avoid or mitigate those effects.

If the FDIC is appointed as receiver under OLA, then the powers of the receiver, and the rights and obligations of creditors and other parties who have dealt with the institution, would be determined under OLA, and not under the bankruptcy or insolvency law that would otherwise apply. The powers of the receiver under OLA were generally based on the powers of the FDIC as receiver for depository institutions under the FDIA.

Substantial differences in the rights of creditors exist between OLA and the U.S. Bankruptcy Code, including the right of the FDIC under OLA to disregard the strict priority of creditor claims in some circumstances, the use of an administrative claims procedure to determine creditors' claims (as opposed to the judicial procedure utilized in bankruptcy proceedings), and the right of the FDIC to transfer claims to a "bridge" entity. In addition, OLA limits the ability of creditors to enforce certain contractual cross-defaults against affiliates of the institution in receivership. The FDIC has issued a notice that it would likely resolve a failed FHC by transferring its assets to a "bridge" holding company under its "single point of entry" or "SPOE" strategy pursuant to OLA.

**Deposit Insurance.** Deposits at GS Bank USA have the benefit of FDIC insurance up to the applicable limits. The FDIC's Deposit Insurance Fund is funded by assessments on insured depository institutions. GS Bank USA's assessment (subject to adjustment by the FDIC) is currently based on its average total consolidated assets less its average tangible equity during the assessment period, its supervisory ratings and specified forward-looking financial measures used to calculate the assessment rate. In addition, deposits at GSIB are covered by the Financial Services Compensation Scheme up to the applicable limits.

**Prompt Corrective Action.** The U.S. Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) requires the U.S. federal bank regulatory agencies to take "prompt corrective action" in respect of depository institutions that do not meet specified capital requirements. FDICIA establishes five capital categories for FDIC-insured banks, such as GS Bank USA: well-capitalized, adequately capitalized, undercapitalized, significantly undercapitalized and critically undercapitalized.

An institution may be downgraded to, or deemed to be in, a capital category that is lower than is indicated by its capital ratios if it is determined to be in an unsafe or unsound condition or if it receives an unsatisfactory examination rating with respect to certain matters. FDICIA imposes progressively more restrictive constraints on operations, management and capital distributions, as the capital category of an institution declines. Failure to meet the capital requirements could also require a depository institution to raise capital. Ultimately, critically undercapitalized institutions are subject to the appointment of a receiver or conservator, as described in "Insolvency of an Insured Depository Institution or a Bank Holding Company" above.

The prompt corrective action regulations do not apply to BHCs. However, the FRB is authorized to take appropriate action at the BHC level, based upon the undercapitalized status of the BHC's depository institution subsidiaries. In certain instances relating to an undercapitalized depository institution subsidiary, the BHC would be required to guarantee the performance of the undercapitalized subsidiary's capital restoration plan and might be liable for civil money damages for failure to fulfill its commitments on that guarantee. Furthermore, in the event of the bankruptcy of the BHC, the guarantee would take priority over the BHC's general unsecured creditors, as described in "Source of Strength" above.

**Volcker Rule and Other Restrictions on Activities.** As a BHC, we are subject to limitations on the types of business activities we may engage in.

***Volcker Rule.*** The provisions of the Dodd-Frank Act referred to as the "Volcker Rule" became effective in July 2015. The Volcker Rule prohibits "proprietary trading," but permits activities such as underwriting, market making and risk-mitigation hedging, requires an extensive compliance program and includes additional reporting and record-keeping requirements.

In addition, the Volcker Rule limits the sponsorship of, and investment in, "covered funds" (as defined in the rule) by banking entities, including us. It also limits certain types of transactions between us and our sponsored funds, similar to the limitations on transactions between depository institutions and their affiliates. Covered funds include our private equity funds, certain of our credit and real estate funds, our hedge funds and certain other investment structures. The limitation on investments in covered funds requires us to limit our investment in each such fund to 3% or less of the fund's net asset value, and to limit our aggregate investment in all such funds to 3% or less of our Tier 1 capital.

The FRB has extended the conformance period to July 2022 for our investments in, and relationships with, certain legacy "illiquid funds" (as defined in the Volcker Rule) that were in place prior to December 2013. See Note 6 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for further information about our investments in such funds.

In July 2018, the FRB, OCC, FDIC, CFTC and SEC issued a notice of proposed rulemaking intended to amend the application of the Volcker Rule based on the size and scope of a banking entity's trading activities and to clarify and amend certain definitions, requirements and exemptions. The ultimate impact of any amendments to the Volcker Rule will depend on, among other things, further rulemaking and implementation guidance from the relevant U.S. federal regulatory agencies and the development of market practices and standards.

***Other Restrictions.*** FHCs generally can engage in a broader range of financial and related activities than are otherwise permissible for BHCs as long as they continue to meet the eligibility requirements for FHCs. The broader range of permissible activities for FHCs includes underwriting, dealing and making markets in securities and making investments in non-FHCs (merchant banking activities). In addition, certain FHCs are permitted to engage in certain commodities activities in the U.S. that may otherwise be impermissible for BHCs, so long as the assets held pursuant to these activities do not equal 5% or more of their consolidated assets.

The FRB, however, has the authority to limit an FHC's ability to conduct activities that would otherwise be permissible, and will likely do so if the FHC does not satisfactorily meet certain requirements of the FRB. For example, if an FHC or any of its U.S. depository institution subsidiaries ceases to maintain its status as well-capitalized or well-managed, the FRB may impose corrective capital and/or managerial requirements, as well as additional limitations or conditions. If the deficiencies persist, the FHC may be required to divest its U.S. depository institution subsidiaries or to cease engaging in activities other than the business of banking and certain closely related activities.

If any insured depository institution subsidiary of an FHC fails to maintain at least a "satisfactory" rating under the Community Reinvestment Act, the FHC would be subject to restrictions on certain new activities and acquisitions.

In addition, we are required to obtain prior FRB approval before engaging in certain banking and other financial activities both within and outside the U.S.

In September 2016, the FRB issued a proposed rule which, if adopted, would impose new requirements on the physical commodity activities and certain merchant banking activities of FHCs. The proposed rule would, among other things, (i) require FHCs to hold additional capital in connection with covered physical commodity activities, including merchant banking investments in companies engaged in physical commodity activities; (ii) tighten the quantitative limits on permissible physical trading activity; and (iii) establish new public reporting requirements on the nature and extent of an FHC's physical commodity holdings and activities. In addition, in a September 2016 report, the FRB recommended that Congress repeal (i) the authority of FHCs to engage in merchant banking activities; and (ii) the authority described above for certain FHCs to engage in certain otherwise permissible commodities activities.

In June 2018, the FRB issued a final rule regarding single counterparty credit limits, which imposes more stringent requirements for credit exposures among major financial institutions. The final rule requires U.S. G-SIBs, such as us, to comply by January 1, 2020. In addition, the FRB has proposed early remediation requirements, which are modeled on the prompt corrective action regime, described in "Prompt Corrective Action" above, but are designed to require action to begin in earlier stages of a company's financial distress, based on a range of triggers, including capital and leverage, stress test results, liquidity and risk management.

In addition, New York State banking law imposes lending limits (which take into account credit exposure from derivative transactions) and other requirements that could impact the manner and scope of GS Bank USA's activities.

The U.S. federal bank regulatory agencies have issued guidance that focuses on transaction structures and risk management frameworks and that outlines high-level principles for safe-and-sound leveraged lending, including underwriting standards, valuation and stress testing. This guidance has, among other things, limited the percentage amount of debt that can be included in certain transactions. The status of this guidance is uncertain as the U.S. Government Accountability Office has determined that it is a rule subject to review under the Congressional Review Act.

**Broker-Dealer and Securities Regulation**

Our broker-dealer subsidiaries are subject to regulations that cover all aspects of the securities business, including sales methods, trade practices, use and safekeeping of clients' funds and securities, capital structure, record-keeping, the financing of clients' purchases, and the conduct of directors, officers and employees. In the U.S., the SEC is the federal agency responsible for the administration of the federal securities laws. GS&Co. is registered as a broker-dealer, a municipal advisor and an investment adviser with the SEC and as a broker-dealer in all 50 states and the District of Columbia. U.S. self-regulatory organizations, such as FINRA and the NYSE, adopt rules that apply to, and examine, broker-dealers such as GS&Co.

U.S. state securities and other U.S. regulators also have regulatory or oversight authority over GS&Co. Similarly, our businesses are also subject to regulation by various non-U.S. governmental and regulatory bodies and self-regulatory authorities in virtually all countries where we have offices, as described further below, as well as in "Other Regulation." For a description of net capital requirements applicable to GS&Co., see "Management's Discussion and Analysis of Financial Condition and Results of Operations — Equity Capital Management and Regulatory Capital — U.S. Regulated Broker-Dealer Subsidiaries" in Part II, Item 7 of this Form 10-K.

In Europe, we provide broker-dealer services that are subject to oversight by national regulators. These services are regulated in accordance with national laws, many of which implement E.U. directives, and, increasingly, by directly applicable E.U. regulations. These national and E.U. laws require, among other things, compliance with certain capital adequacy standards, customer protection requirements and market conduct and trade reporting rules.

Goldman Sachs Japan Co., Ltd. (GSJCL), our regulated Japanese broker-dealer, is subject to capital requirements imposed by Japan's Financial Services Agency. GSJCL is also regulated by the Tokyo Stock Exchange, the Osaka Exchange, the Tokyo Financial Exchange, the Japan Securities Dealers Association, the Tokyo Commodity Exchange, Securities and Exchange Surveillance Commission, Bank of Japan and the Ministry of Finance, among others.

Also, the Securities and Futures Commission in Hong Kong, the Monetary Authority of Singapore, the China Securities Regulatory Commission, the Korean Financial Supervisory Service, the Reserve Bank of India, the Securities and Exchange Board of India, the Australian Securities and Investments Commission and the Australian Securities Exchange, among others, regulate various of our subsidiaries and also have capital standards and other requirements comparable to the rules of the SEC.

Our exchange-based market-making activities are subject to extensive regulation by a number of securities exchanges. As a market maker on exchanges, we are required to maintain orderly markets in the securities to which we are assigned.

In April 2018, the SEC issued a proposed rule that would require broker-dealers to act in the best interest of their customers, and also proposed an interpretation clarifying the SEC's views of the existing fiduciary duty owed by investment advisers to their clients. Additionally, the SEC issued a proposed rule that would require broker-dealers and investment advisers to provide a standardized, short-form disclosure highlighting services offered, applicable standards of conduct, fees and costs, the differences between brokerage and advisory services, and any conflicts of interest.

In November 2018, the SEC adopted a final rule requiring broker-dealers to provide to specified customers at their request individualized information about the execution of certain stock orders, including how such orders were routed and the average rebates received or fees paid.

GS&Co., GS Bank USA and other U.S. subsidiaries are also subject to rules adopted by U.S. federal agencies pursuant to the Dodd-Frank Act that require any person who organizes or initiates certain asset-backed securities transactions to retain a portion (generally, at least five percent) of any credit risk that the person conveys to a third party. For certain securitization transactions, retention by third-party purchasers may satisfy this requirement.

Securitizations would also be affected by rules proposed by the SEC to implement the Dodd-Frank Act's prohibition against securitization participants engaging in any transaction that would involve or result in any material conflict of interest with an investor in a securitization transaction. The proposed rules would exempt bona fide market-making activities and risk-mitigating hedging activities in connection with securitization activities from the general prohibition.

The SEC, FINRA and regulators in various non-U.S. jurisdictions have imposed both conduct-based and disclosure-based requirements with respect to research reports and research analysts and may impose additional regulations.

**Swaps, Derivatives and Commodities Regulation**

The commodity futures, commodity options and swaps industry in the U.S. is subject to regulation under the U.S. Commodity Exchange Act (CEA). The CFTC is the U.S. federal agency charged with the administration of the CEA. In addition, the SEC is the U.S. federal agency charged with the regulation of security-based swaps. The rules and regulations of various self-regulatory organizations, such as the Chicago Mercantile Exchange, other futures exchanges and the National Futures Association, also govern commodity futures, commodity options and swaps activities.

The terms "swaps" and "security-based swaps" include a wide variety of derivative instruments in addition to those conventionally referred to as swaps (including certain forward contracts and options), and relate to a wide variety of underlying assets or obligations, including currencies, commodities, interest or other monetary rates, yields, indices, securities, credit events, loans and other financial obligations.

CFTC rules require registration of swap dealers, mandatory clearing and execution of interest rate and credit default swaps and real-time public reporting and adherence to business conduct standards for all in-scope swaps. In December 2016, the CFTC proposed revised capital regulations for swap dealers that are not subject to the capital rules of a prudential regulator, such as the FRB, as well as a liquidity requirement for those swap dealers.

SEC rules govern the registration and regulation of security-based swap dealers but compliance with such rules is not currently required. In October 2018, the SEC re-proposed, and requested comment on, a number of its rules for security-based swap dealers, including capital, margin and segregation requirements.

GS&Co. is registered with the CFTC as a futures commission merchant, and several of our subsidiaries, including GS&Co., are registered with the CFTC and act as commodity pool operators and commodity trading advisors. GS&Co. and other subsidiaries, including GS Bank USA, GSI and J. Aron & Company LLC (J. Aron), are registered with the CFTC as swap dealers. In addition, GS&Co. and Goldman Sachs Financial Markets, L.P. are registered with the SEC as OTC derivatives dealers.

Our affiliates registered as swap dealers are subject to the margin rules issued by the CFTC (in the case of our non-bank swap dealers) and the FRB (in the case of GS Bank USA). The rules for variation margin have become effective, and those for initial margin will phase in through September 2020 depending on certain activity levels of the swap dealer and the relevant counterparty. In contrast to the FRB margin rules, inter-affiliate transactions under the CFTC margin rules are generally exempt from initial margin requirements.

The CFTC has proposed position limit rules that will limit the size of positions in physical commodity derivatives that can be held by any entity, or any group of affiliates or other parties trading under common control, subject to certain exemptions, such as for bona fide hedging positions. These proposed rules would apply to positions in swaps, as well as futures and options on futures.

Similar types of swap regulation have been proposed or adopted in jurisdictions outside the U.S., including in the E.U. and Japan. For example, the E.U. has established regulatory requirements relating to portfolio reconciliation and reporting, clearing certain OTC derivatives and margining for uncleared derivatives activities under the European Market Infrastructure Regulation.

The CFTC has adopted rules relating to cross-border regulation of swaps, and has proposed cross-border business conduct and registration rules. The CFTC has entered into agreements with certain non-U.S. regulators, including in the E.U., regarding the cross-border regulation of derivatives and the mutual recognition of cross-border clearing houses, and has approved substituted compliance with certain non-U.S. regulations, including E.U. regulations, related to certain business conduct requirements and margin rules. The U.S. prudential regulators have not yet made a determination with respect to substituted compliance for transactions subject to non-U.S. margin rules.

J. Aron is authorized by the U.S. Federal Energy Regulatory Commission (FERC) to sell wholesale physical power at market-based rates. As a FERC-authorized power marketer, J. Aron is subject to regulation under the U.S. Federal Power Act and FERC regulations and to the oversight of FERC. As a result of our investing activities, Group Inc. is also an "exempt holding company" under the U.S. Public Utility Holding Company Act of 2005 and applicable FERC rules.

In addition, as a result of our power-related and commodities activities, we are subject to energy, environmental and other governmental laws and regulations, as described in "Risk Factors — Our commodities activities, particularly our physical commodities activities, subject us to extensive regulation and involve certain potential risks, including environmental, reputational and other risks that may expose us to significant liabilities and costs" in Part I, Item 1A of this Form 10-K.

### Investment Management Regulation

Our investment management business is subject to significant regulation in numerous jurisdictions around the world relating to, among other things, the safeguarding of client assets, offerings of funds, marketing activities, transactions among affiliates and our management of client funds.

The SEC has adopted rules relating to liquidity risk management that require registered open-end funds to classify and review the liquidity of their portfolio assets. In addition, the rules require funds to make disclosures relating to their liquidity risk management program and report to the SEC instances when a fund's percentage of illiquid investments exceeds certain thresholds or when certain funds experience shortfalls in their highly liquid investments. While some rules became effective in December 2018, certain portfolio asset classification and disclosure requirements will become effective in June 2019 and December 2019.

Certain of our European subsidiaries, including GSAMI, are subject to the Alternative Investment Fund Managers Directive and related regulations, which govern the approval, organizational, marketing and reporting requirements of E.U.-based alternative investment managers and the ability of alternative investment fund managers located outside the E.U. to access the E.U. market.

An E.U. regulation relating to money market funds, including provisions prescribing minimum levels of daily and weekly liquidity, clear labeling of money market funds and internal credit risk assessments, became effective in July 2018.

### Compensation Practices

Our compensation practices are subject to oversight by the FRB and, with respect to some of our subsidiaries and employees, by other regulatory bodies worldwide. The scope and content of compensation regulation in the financial industry are continuing to develop, and we expect that these regulations and resulting market practices will evolve over a number of years.

The FSB has released standards for local regulators to implement certain compensation principles for banks and other financial companies designed to encourage sound compensation practices. The U.S. federal bank regulatory agencies have provided guidance designed to ensure that incentive compensation arrangements at banking organizations take into account risk and are consistent with safe and sound practices. The guidance sets forth the following three key principles with respect to incentive compensation arrangements: (i) the arrangements should provide employees with incentives that appropriately balance risk and financial results in a manner that does not encourage employees to expose their organizations to imprudent risk; (ii) the arrangements should be compatible with effective controls and risk management; and (iii) the arrangements should be supported by strong corporate governance. The guidance provides that supervisory findings with respect to incentive compensation will be incorporated, as appropriate, into the organization's supervisory ratings, which can affect its ability to make acquisitions or perform other actions. The guidance also provides that enforcement actions may be taken against a banking organization if its incentive compensation arrangements or related risk management, control or governance processes pose a risk to the organization's safety and soundness.

The Dodd-Frank Act requires the U.S. financial regulators, including the FRB and SEC, to adopt rules on incentive-based payment arrangements at specified regulated entities having at least $1 billion in total assets (including Group Inc. and some of its depository institution, broker-dealer and investment adviser subsidiaries). The U.S. financial regulators proposed revised rules in 2016, which have not been finalized.

In October 2016, the NYDFS issued guidance emphasizing that its regulated banking institutions, including GS Bank USA, must ensure that any incentive compensation arrangements tied to employee performance indicators are subject to effective risk management, oversight and control.

In the E.U., the CRR and CRD IV include compensation provisions designed to implement the FSB's compensation standards. These rules have been implemented by E.U. member states and, among other things, limit the ratio of variable to fixed compensation of certain employees, including those identified as having a material impact on the risk profile of E.U.-regulated entities, including GSI.

The E.U. has also introduced rules regulating compensation for certain persons providing services to certain investment funds. These requirements are in addition to the guidance issued by U.S. financial regulators described above and the Dodd-Frank Act provision described above.

## Anti-Money Laundering and Anti-Bribery Rules and Regulations

The U.S. Bank Secrecy Act (BSA), as amended by the USA PATRIOT Act of 2001 (PATRIOT Act), contains anti-money laundering and financial transparency laws and mandates the implementation of various regulations applicable to all financial institutions, including standards for verifying client identification at account opening, and obligations to monitor client transactions and report suspicious activities. Through these and other provisions, the BSA and the PATRIOT Act seek to promote the identification of parties that may be involved in terrorism, money laundering or other suspicious activities. Anti-money laundering laws outside the U.S. contain some similar provisions.

In addition, we are subject to laws and regulations worldwide, including the U.S. Foreign Corrupt Practices Act (FCPA) and the U.K. Bribery Act, relating to corrupt and illegal payments to, and hiring practices with regard to, government officials and others. The scope of the types of payments or other benefits covered by these laws is very broad and regulators are frequently using enforcement proceedings to define the scope of these laws. The obligation of financial institutions, including Goldman Sachs, to identify their clients, to monitor for and report suspicious transactions, to monitor direct and indirect payments to government officials, to respond to requests for information by regulatory authorities and law enforcement agencies, and to share information with other financial institutions, has required the implementation and maintenance of internal practices, procedures and controls.

## Privacy and Cyber Security Regulation

Certain of our businesses are subject to laws and regulations enacted by U.S. federal and state governments, the E.U. or other non-U.S. jurisdictions and/or enacted by various regulatory organizations or exchanges relating to the privacy of the information of clients, employees or others, including the GLB Act, the E.U.'s General Data Protection Regulation (GDPR) which took effect on May 25, 2018, the Japanese Personal Information Protection Act, the Hong Kong Personal Data (Privacy) Ordinance, the Australian Privacy Act and the Brazilian Bank Secrecy Law. The GDPR has heightened our privacy compliance obligations, impacted our businesses' collection, processing and retention of personal data and imposed strict standards for reporting data breaches. The GDPR also provides for significant penalties for non-compliance. In addition, the California Consumer Privacy Act (CCPA) was enacted in June 2018 and is scheduled to take effect on January 1, 2020 and will impose privacy compliance obligations with regard to the personal information of California residents.

The NYDFS also requires financial institutions regulated by the NYDFS, including GS Bank USA, to, among other things, (i) establish and maintain a cyber security program designed to ensure the confidentiality, integrity and availability of their information systems; (ii) implement and maintain a written cyber security policy setting forth policies and procedures for the protection of their information systems and nonpublic information; and (iii) designate a Chief Information Security Officer. In addition, in October 2016, the U.S. federal bank regulatory agencies issued an advance notice of proposed rulemaking on potential enhanced cyber risk management standards for large financial institutions.

## Other Regulation

U.S. and non-U.S. government agencies, regulatory bodies and self-regulatory organizations, as well as state securities commissions and other state regulators in the U.S., are empowered to conduct administrative proceedings that can result in censure, fine, the issuance of cease-and-desist orders, or the suspension or expulsion of a regulated entity or its directors, officers or employees. In particular, state attorneys general have become much more active in seeking fines and penalties in enforcement led by the federal regulators. In addition, a number of our other activities require us to obtain licenses, adhere to applicable regulations and be subject to the oversight of various regulators in the jurisdictions in which we conduct these activities.

MiFID II includes extensive market structure reforms, such as the establishment of new trading venue categories for the purposes of discharging the obligation to trade OTC derivatives on a trading platform and enhanced pre- and post-trade transparency covering a wider range of financial instruments. In equities, MiFID II introduced volume caps on non-transparent liquidity trading for trading venues, limited the use of broker-dealer crossing networks and created a new regime for systematic internalizers, which are investment firms that execute client transactions outside a trading venue.

Additional control requirements were introduced for algorithmic trading, high frequency trading and direct electronic access. Commodities trading firms are required to calculate their positions and adhere to specific limits. Other reforms introduced enhanced transaction reporting, the publication of best execution data by investment firms and trading venues, transparency on costs and charges of service to investors, changes to the way investment managers can pay for the receipt of investment research and mandatory unbundling for broker-dealers between execution and other major services.

The E.U. and national financial legislators and regulators in the E.U. have proposed or adopted numerous further market reforms that may impact our businesses, including heightened corporate governance standards for financial institutions, rules on key information documents for packaged retail and insurance-based investment products and rules on indices that are used as benchmarks for financial instruments or funds. In addition, the European Commission, the European Securities and Markets Authority and the European Banking Authority have announced or are formulating regulatory standards and other measures which will impact our European operations. Certain of our European subsidiaries are also regulated by the securities, derivatives and commodities exchanges of which they are members.

As described above, many of our subsidiaries are subject to regulatory capital requirements in jurisdictions throughout the world. Subsidiaries not subject to separate regulation may hold capital to satisfy local tax guidelines, rating agency requirements or internal policies, including policies concerning the minimum amount of capital a subsidiary should hold based upon its underlying risk.

## Executive Officers of The Goldman Sachs Group, Inc.

Set forth below are the name, age, present title, principal occupation and certain biographical information for our executive officers. Our executive officers have been appointed by and serve at the pleasure of our Board of Directors.

**Dane E. Holmes, 48**
Mr. Holmes has been an Executive Vice President and Global Head of Human Capital Management since January 2018 and Global Head of Pine Street, our leadership development program, since 2016. He had previously served as Global Head of Investor Relations since October 2007.

**John F.W. Rogers, 62**
Mr. Rogers has been an Executive Vice President since April 2011 and Chief of Staff and Secretary to our Board of Directors since December 2001.

**Stephen M. Scherr, 54**
Mr. Scherr has been an Executive Vice President and Chief Financial Officer since November 2018. He had previously served as Chief Executive Officer of Goldman Sachs Bank USA since May 2016, and head of the Consumer & Commercial Banking Division from 2016 to 2018. From June 2014 to 2017, he was Chief Strategy Officer, and from 2011 to 2016 he was Head of the Latin America business. He was also Global Head of the Financing Group from 2008 to 2014.

**Karen P. Seymour, 57**
Ms. Seymour has been an Executive Vice President, General Counsel and Secretary, and Head or Co-Head of the Legal Department since January 2018. From 2000 through January 2002 and 2005 through 2017, she was a partner at Sullivan & Cromwell LLP, a global law firm, including serving as a member of its management committee from April 2015 to December 2017, and as the co-managing partner of its litigation group from December 2012 to April 2015.

**Sarah E. Smith, 59**
Ms. Smith has been an Executive Vice President and Global Head of Compliance since March 2017. She had previously served as Controller and Chief Accounting Officer since 2002.

**David M. Solomon, 57**
Mr. Solomon has been Chairman of the Board since January 2019, and Chief Executive Officer and a director since October 2018. He had previously served as President and Chief or Co-Chief Operating Officer since January 2017 and Co-Head of the Investment Banking Division from July 2006 to December 2016.

**John E. Waldron, 49**
Mr. Waldron has been President and Chief Operating Officer since October 2018. He had previously served as Co-Head of the Investment Banking Division since December 2014. Prior to that he was Global Head of Investment Banking Services/Client Coverage for the Investment Banking Division and had oversight of the Investment Banking Services Leadership Group, and from 2007 to 2009 was Global Co-Head of the Financial Sponsors Group.

## Available Information

Our internet address is www.goldmansachs.com and the investor relations section of our website is located at www.goldmansachs.com/investor-relations. We make available free of charge through the investor relations section of our website, annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the U.S. Securities Exchange Act of 1934 (Exchange Act), as well as proxy statements, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC.

Also posted on our website, and available in print upon request of any shareholder to our Investor Relations Department, are our certificate of incorporation and by-laws, charters for our Audit Committee, Risk Committee, Compensation Committee, Corporate Governance and Nominating Committee, and Public Responsibilities Committee, our Policy Regarding Director Independence Determinations, our Policy on Reporting of Concerns Regarding Accounting and Other Matters, our Corporate Governance Guidelines and our Code of Business Conduct and Ethics governing our directors, officers and employees. Within the time period required by the SEC, we will post on our website any amendment to the Code of Business Conduct and Ethics and any waiver applicable to any executive officer, director or senior financial officer.

In addition, our website includes information concerning:

- Purchases and sales of our equity securities by our executive officers and directors;
- Disclosure relating to certain non-GAAP financial measures (as defined in the SEC's Regulation G) that we may make public orally, telephonically, by webcast, by broadcast or by other means from time to time;
- Dodd-Frank Act stress test results;
- The public portion of our resolution plan submission;
- Our risk management practices and regulatory capital ratios, as required under the disclosure-related provisions of the Capital Framework, which are based on the third pillar of Basel III; and
- Our quarterly average LCR.

Our Investor Relations Department can be contacted at The Goldman Sachs Group, Inc., 200 West Street, 29th Floor, New York, New York 10282, Attn: Investor Relations, telephone: 212-902-0300, e-mail: gs-investor-relations@gs.com.

From time to time, we use our website, our Twitter account (twitter.com/GoldmanSachs), our Instagram account (instagram.com/GoldmanSachs) and other social media channels as additional means of disclosing public information to investors, the media and others interested in Goldman Sachs. In addition, our officers may use similar social media channels to disclose public information. It is possible that certain information we or our officers post on our website and on social media could be deemed to be material information, and we encourage investors, the media and others interested in Goldman Sachs to review the business and financial information we or our officers post on our website and on the social media channels identified above. The information on our website and those social media channels is not incorporated by reference into this Form 10-K.

## Cautionary Statement Pursuant to the U.S. Private Securities Litigation Reform Act of 1995

We have included or incorporated by reference in this Form 10-K, and from time to time our management may make, statements that may constitute "forward-looking statements" within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are not historical facts, but instead represent only our beliefs regarding future events, many of which, by their nature, are inherently uncertain and outside our control.

These statements include statements other than historical information or statements of current conditions and may relate to our future plans and objectives and results, among other things, and may also include statements about the effect of changes to the capital, leverage, liquidity, long-term debt and TLAC rules applicable to banks and BHCs, the impact of the Dodd-Frank Act on our businesses and operations, and various legal proceedings, governmental investigations or mortgage-related contingencies as set forth in both Notes 27 and 18 to the consolidated financial statements in Part II, Item 8 of this Form 10-K, as well as statements about the results of our Dodd-Frank Act and our stress tests, statements about the objectives and effectiveness of our business continuity plan, information security program, risk management and liquidity policies, statements about our resolution plan and resolution strategy and their implications for our debtholders and other stakeholders, statements about the design and effectiveness of our resolution capital and liquidity models and our triggers and alerts framework, statements about trends in or growth opportunities for our businesses, statements about our future status, activities or reporting under U.S. or non-U.S. banking and financial regulation, statements about our investment banking transaction backlog, statements about our expected tax rate, statements about the estimated impact of new accounting standards, statements about the level of capital actions, statements about our expected interest income, statements about our credit exposures, statements about our preparations for Brexit, including our plan to manage a hard Brexit scenario, statements about the replacement of LIBOR and other IBORs and the objectives of our program related to the transition from IBORs to alternative risk-free reference rates, and statements about the adequacy of our allowance for credit losses.

By identifying these statements for you in this manner, we are alerting you to the possibility that our actual results and financial condition may differ, possibly materially, from the anticipated results and financial condition indicated in these forward-looking statements. Important factors that could cause our actual results and financial condition to differ from those indicated in these forward-looking statements include, among others, those described below and in "Risk Factors" in Part I, Item 1A of this Form 10-K.

Statements about our investment banking transaction backlog are subject to the risk that the terms of these transactions may be modified or that they may not be completed at all; therefore, the net revenues, if any, that we actually earn from these transactions may differ, possibly materially, from those currently expected. Important factors that could result in a modification of the terms of a transaction or a transaction not being completed include, in the case of underwriting transactions, a decline or continued weakness in general economic conditions, outbreak of hostilities, volatility in the securities markets generally or an adverse development with respect to the issuer of the securities and, in the case of financial advisory transactions, a decline in the securities markets, an inability to obtain adequate financing, an adverse development with respect to a party to the transaction or a failure to obtain a required regulatory approval. For information about other important factors that could adversely affect our investment banking transactions, see "Risk Factors" in Part I, Item 1A of this Form 10-K.

Statements about our expected 2019 effective income tax rate are subject to the risk that our tax rate may differ from the anticipated rate indicated in such statements, possibly materially, due to, among other things, changes in our earnings mix, our profitability and entities in which we generate profits, the assumptions we have made in forecasting our expected tax rate, as well as guidance that may be issued by the U.S. Internal Revenue Service.

We provided in this filing information regarding our NSFR. The statements with respect to our NSFR are forward-looking statements, based on our current interpretation, expectations and understandings of the relevant proposal, and reflect significant assumptions about the treatment of various assets and liabilities and the manner in which our NSFR is calculated. As a result, the methods used to calculate our NSFR may differ, possibly materially, from those used in calculating our NSFR for any future disclosures. The ultimate methods of calculating our NSFR will depend on, among other things, rulemaking from the U.S. federal bank regulatory agencies and the development of market practices and standards.

# Item 1A. Risk Factors

We face a variety of risks that are substantial and inherent in our businesses, including market, liquidity, credit, operational, legal, regulatory and reputational risks. The following are some of the more important factors that could affect our businesses.

***Our businesses have been and may continue to be adversely affected by conditions in the global financial markets and economic conditions generally.***

Our businesses, by their nature, do not produce predictable earnings, and all of our businesses are materially affected by conditions in the global financial markets and economic conditions generally, both directly and through their impact on client activity levels. These conditions can change suddenly and negatively.

Our financial performance is highly dependent on the environment in which our businesses operate. A favorable business environment is generally characterized by, among other factors, high global gross domestic product growth, regulatory and market conditions which result in transparent, liquid and efficient capital markets, low inflation, high business and investor confidence, stable geopolitical conditions, clear regulations and strong business earnings. Unfavorable or uncertain economic and market conditions can be caused by: concerns about sovereign defaults; uncertainty concerning fiscal or monetary policy, government shutdowns, debt ceilings or funding; the extent of and uncertainty about tax and other regulatory changes; declines in economic growth, business activity or investor or business confidence; limitations on the availability or increases in the cost of credit and capital; illiquid markets; increases in inflation, interest rates, exchange rate or basic commodity price volatility or default rates; the imposition of tariffs or other limitations on international trade and travel; outbreaks of domestic or international tensions or hostilities, terrorism, nuclear proliferation, cybersecurity threats or attacks and other forms of disruption to or curtailment of global communication, energy transmission or transportation networks or other geopolitical instability or uncertainty, such as Brexit; corporate, political or other scandals that reduce investor confidence in capital markets; extreme weather events or other natural disasters or pandemics; or a combination of these or other factors.

The financial services industry and the securities markets have been materially and adversely affected in the past by significant declines in the values of nearly all asset classes and by a serious lack of liquidity. In addition, concerns about European sovereign debt risk and its impact on the European banking system, the impact of Brexit, the imposition of tariffs by the U.S. and by other countries in response thereto, and changes in interest rates and other market conditions or actual changes in interest rates and other market conditions, have resulted, at times, in significant volatility while negatively impacting the levels of client activity.

General uncertainty about economic, political and market activities, and the scope, timing and impact of regulatory reform, as well as weak consumer, investor and CEO confidence resulting in large part from such uncertainty, continues to negatively impact client activity, which adversely affects many of our businesses. Periods of low volatility and periods of high volatility combined with a lack of liquidity, have at times had an unfavorable impact on our market-making businesses.

Financial institution returns in many countries may be negatively impacted by increased funding costs due in part to the lack of perceived government support of such institutions in the event of future financial crises relative to financial institutions in countries in which governmental support is maintained. In addition, liquidity in the financial markets has also been negatively impacted as market participants and market practices and structures continue to adjust to new regulations.

Our revenues and profitability and those of our competitors have been and will continue to be impacted by requirements relating to capital, additional loss-absorbing capacity, leverage, minimum liquidity and long-term funding levels, requirements related to resolution and recovery planning, derivatives clearing and margin rules and levels of regulatory oversight, as well as limitations on which and, if permitted, how certain business activities may be carried out by financial institutions.

The degree to which these and other changes since the financial crisis continue to have an impact on the profitability of financial institutions will depend on the effect of regulations adopted after 2008 and new regulations, the manner in which markets, market participants and financial institutions have continued to adapt to these regulations, and the prevailing economic and financial market conditions. However, there is a significant risk that such changes will negatively impact the absolute level of revenues, profitability and return on equity for us and other financial institutions.

***Our businesses and those of our clients are subject to extensive and pervasive regulation around the world.***

As a participant in the financial services industry and a systemically important financial institution, we are subject to extensive regulation in jurisdictions around the world. We face the risk of significant intervention by law enforcement, regulatory and taxing authorities, as well as private litigation, in all jurisdictions in which we conduct our businesses. In many cases, our activities may be subject to overlapping and divergent regulation in different jurisdictions. Among other things, as a result of law enforcement authorities, regulators or private parties challenging our compliance with existing laws and regulations, we or our employees could be fined or criminally sanctioned, prohibited from engaging in some of our business activities, subject to limitations or conditions on our business activities, including higher capital requirements, or subjected to new or substantially higher taxes or other governmental charges in connection with the conduct of our businesses or with respect to our employees. Such limitations or conditions may limit our business activities and negatively impact our profitability.

In addition to the impact on the scope and profitability of our business activities, day-to-day compliance with existing laws and regulations, in particular those adopted since 2008, has involved and will, except to the extent that some of such regulations are modified or otherwise repealed, continue to involve significant amounts of time, including that of our senior leaders and that of a large number of dedicated compliance and other reporting and operational personnel, all of which may negatively impact our profitability.

If there are new laws or regulations or changes in the enforcement of existing laws or regulations applicable to our businesses or those of our clients, including capital, liquidity, leverage, long-term debt, total loss-absorbing capacity and margin requirements, restrictions on leveraged lending or other business practices, reporting requirements, requirements relating to recovery and resolution planning, tax burdens and compensation restrictions, that are imposed on a limited subset of financial institutions (either based on size, method of funding, activities, geography or other criteria), compliance with these new laws or regulations, or changes in the enforcement of existing laws or regulations, could adversely affect our ability to compete effectively with other institutions that are not affected in the same way. In addition, regulation imposed on financial institutions or market participants generally, such as taxes on financial transactions, could adversely impact levels of market activity more broadly, and thus impact our businesses.

These developments could impact our profitability in the affected jurisdictions, or even make it uneconomic for us to continue to conduct all or certain of our businesses in such jurisdictions, or could cause us to incur significant costs associated with changing our business practices, restructuring our businesses, moving all or certain of our businesses and our employees to other locations or complying with applicable capital requirements, including reducing dividends or share repurchases, liquidating assets or raising capital in a manner that adversely increases our funding costs or otherwise adversely affects our shareholders and creditors.

U.S. and non-U.S. regulatory developments, in particular the Dodd-Frank Act and Basel III, have significantly altered the regulatory framework within which we operate and have adversely affected and may in the future affect our profitability.

Among the aspects of the Dodd-Frank Act that have affected or may in the future affect our businesses are: increased capital, liquidity and reporting requirements; limitations on activities in which we may engage; increased regulation of and restrictions on OTC derivatives markets and transactions; limitations on incentive compensation; limitations on affiliate transactions; requirements to reorganize or limit activities in connection with recovery and resolution planning; increased deposit insurance assessments; and increased standards of care for broker-dealers and investment advisers in dealing with clients. The implementation of higher capital requirements, the LCR, the NSFR, requirements relating to long-term debt and total loss-absorbing capacity and the prohibition on proprietary trading and the sponsorship of, or investment in, covered funds by the Volcker Rule may continue to adversely affect our profitability and competitive position, particularly if these requirements do not apply equally to our competitors or are not implemented uniformly across jurisdictions.

As described in "Business — Regulation — Banking Supervision and Regulation" in Part I, Item 1 of this Form 10-K, Group Inc.'s proposed capital actions and capital plan are reviewed by the FRB as part of the CCAR process. If the FRB objects to our proposed capital actions in our capital plan, Group Inc. could be prohibited from taking some or all of the proposed capital actions, including increasing or paying dividends on common or preferred stock or repurchasing common stock or other capital securities. Our inability to carry out our proposed capital actions could, among other things, prevent us from returning capital to our shareholders and impact our return on equity. Additionally, as a consequence of our designation as a G-SIB, we are subject to the G-SIB buffer. Our G-SIB buffer is updated annually based on financial data from the prior year. Expansion of our businesses or growth in our balance sheet may result in an increase in our G-SIB buffer and a corresponding increase in our capital requirements.

We are also subject to laws and regulations, such as the GDPR, relating to the privacy of the information of clients, employees or others, and any failure to comply with these laws and regulations could expose us to liability and/or reputational damage. As new privacy-related laws and regulations are implemented, the time and resources needed for us to comply with such laws and regulations, as well as our potential liability for non-compliance and reporting obligations in the case of data breaches, may significantly increase.

In addition, our businesses are increasingly subject to laws and regulations relating to surveillance, encryption and data on-shoring in the jurisdictions in which we operate. Compliance with these laws and regulations may require us to change our policies, procedures and technology for information security, which could, among other things, make us more vulnerable to cyber attacks and misappropriation, corruption or loss of information or technology.

We have entered into new consumer-oriented deposit-taking and lending businesses, and we currently expect to expand the product and geographic scope of our offerings. Entering into such new businesses, as with any new business, subjects us to numerous additional regulations in the jurisdictions in which these businesses operate. Not only are these regulations extensive, but they involve types of regulations and supervision, as well as regulatory compliance risks, that we have not previously encountered. The level of regulatory scrutiny and the scope of regulations affecting financial interactions with consumers is often much greater than that associated with doing business with institutions and high-net-worth individuals. Complying with such new regulations is time-consuming, costly and presents new and increased risks.

Increasingly, regulators and courts have sought to hold financial institutions liable for the misconduct of their clients where such regulators and courts have determined that the financial institution should have detected that the client was engaged in wrongdoing, even though the financial institution had no direct knowledge of the activities engaged in by its client. Regulators and courts have also increasingly found liability as a "control person" for activities of entities in which financial institutions or funds controlled by financial institutions have an investment, but which they do not actively manage. In addition, regulators and courts continue to seek to establish "fiduciary" obligations to counterparties to which no such duty had been assumed to exist. To the extent that such efforts are successful, the cost of, and liabilities associated with, engaging in brokerage, clearing, market-making, prime brokerage, investing and other similar activities could increase significantly. To the extent that we have fiduciary obligations in connection with acting as a financial adviser, investment adviser or in other roles for individual, institutional, sovereign or investment fund clients, any breach, or even an alleged breach, of such obligations could have materially negative legal, regulatory and reputational consequences.

For information about the extensive regulation to which our businesses are subject, see "Business — Regulation" in Part I, Item 1 of this Form 10-K.

***Our businesses have been and may be adversely affected by declining asset values. This is particularly true for those businesses in which we have net "long" positions, receive fees based on the value of assets managed, or receive or post collateral.***

Many of our businesses have net "long" positions in debt securities, loans, derivatives, mortgages, equities (including private equity and real estate) and most other asset classes. These include positions we take when we act as a principal to facilitate our clients' activities, including our exchange-based market-making activities, or commit large amounts of capital to maintain positions in interest rate and credit products, as well as through our currencies, commodities, equities and mortgage-related activities. In addition, we invest in similar asset classes. Substantially all of our investing and market-making positions and a portion of our loans are marked-to-market on a daily basis and declines in asset values directly and immediately impact our earnings, unless we have effectively "hedged" our exposures to such declines.

In certain circumstances (particularly in the case of credit products, including leveraged loans, and private equities or other securities that are not freely tradable or lack established and liquid trading markets), it may not be possible or economic to hedge such exposures and to the extent that we do so the hedge may be ineffective or may greatly reduce our ability to profit from increases in the values of the assets. Sudden declines and significant volatility in the prices of assets may substantially curtail or eliminate the trading markets for certain assets, which may make it difficult to sell, hedge or value such assets. The inability to sell or effectively hedge assets reduces our ability to limit losses in such positions and the difficulty in valuing assets may negatively affect our capital, liquidity or leverage ratios, increase our funding costs and generally require us to maintain additional capital.

In our exchange-based market-making activities, we are obligated by stock exchange rules to maintain an orderly market, including by purchasing securities in a declining market. In markets where asset values are declining and in volatile markets, this results in losses and an increased need for liquidity.

We receive asset-based management fees based on the value of our clients' portfolios or investment in funds managed by us and, in some cases, we also receive incentive fees based on increases in the value of such investments. Declines in asset values reduce the value of our clients' portfolios or fund assets, which in turn reduce the fees we earn for managing such assets.

We post collateral to support our obligations and receive collateral to support the obligations of our clients and counterparties in connection with our client execution businesses. When the value of the assets posted as collateral or the credit ratings of the party posting collateral decline, the party posting the collateral may need to provide additional collateral or, if possible, reduce its trading position. An example of such a situation is a "margin call" in connection with a brokerage account. Therefore, declines in the value of asset classes used as collateral mean that either the cost of funding positions is increased or the size of positions is decreased.

If we are the party providing collateral, this can increase our costs and reduce our profitability and if we are the party receiving collateral, this can also reduce our profitability by reducing the level of business done with our clients and counterparties. In addition, volatile or less liquid markets increase the difficulty of valuing assets, which can lead to costly and time-consuming disputes over asset values and the level of required collateral, as well as increased credit risk to the recipient of the collateral due to delays in receiving adequate collateral.

In cases where we foreclose on collateral, sudden declines in the value or liquidity of such collateral may, despite credit monitoring, over-collateralization, the ability to call for additional collateral or the ability to force repayment of the underlying obligation, result in significant losses to us, especially where there is a single type of collateral supporting the obligation. In addition, we have been, and may in the future be, subject to claims that the foreclosure was not permitted under the legal documents, was conducted in an improper manner or caused a client or counterparty to go out of business.

***Our businesses have been and may be adversely affected by disruptions in the credit markets, including reduced access to credit and higher costs of obtaining credit.***

Widening credit spreads, as well as significant declines in the availability of credit, have in the past adversely affected our ability to borrow on a secured and unsecured basis and may do so in the future. We fund ourselves on an unsecured basis by issuing long-term debt, by accepting deposits at our bank subsidiaries, by issuing hybrid financial instruments or by obtaining loans or lines of credit from commercial or other banking entities. We seek to finance many of our assets on a secured basis. Any disruptions in the credit markets may make it harder and more expensive to obtain funding for our businesses. If our available funding is limited or we are forced to fund our operations at a higher cost, these conditions may require us to curtail our business activities and increase our cost of funding, both of which could reduce our profitability, particularly in our businesses that involve investing, lending and market making.

Our clients engaging in mergers, acquisitions and other types of strategic transactions often rely on access to the secured and unsecured credit markets to finance their transactions. A lack of available credit or an increased cost of credit can adversely affect the size, volume and timing of our clients' merger and acquisition transactions, particularly large transactions, and adversely affect our financial advisory and underwriting businesses.

Our credit businesses have been and may in the future be negatively affected by a lack of liquidity in credit markets. A lack of liquidity reduces price transparency, increases price volatility and decreases transaction volumes and size, all of which can increase transaction risk or decrease the profitability of such businesses.

***Our market-making activities have been and may be affected by changes in the levels of market volatility.***

Certain of our market-making activities depend on market volatility to provide trading and arbitrage opportunities to our clients, and decreases in volatility have reduced and may in the future reduce these opportunities and the level of client activity associated with them and adversely affect the results of these activities. On the other hand, increased volatility, while it can increase trading volumes and spreads, also increases risk as measured by Value-at-Risk (VaR) and may expose us to increased risks in connection with our market-making activities or cause us to reduce our market-making inventory in order to avoid increasing our VaR. Limiting the size of our market-making positions can adversely affect our profitability. In periods when volatility is increasing, but asset values are declining significantly, it may not be possible to sell assets at all or it may only be possible to do so at steep discounts. In such circumstances we may be forced to either take on additional risk or to realize losses in order to decrease our VaR. In addition, increases in volatility increase the level of our RWAs, which increases our capital requirements.

***Our investment banking, client execution and investment management businesses have been adversely affected and may in the future be adversely affected by market uncertainty or lack of confidence among investors and CEOs due to general declines in economic activity and other unfavorable economic, geopolitical or market conditions.***

Our investment banking business has been, and may in the future be, adversely affected by market conditions. Poor economic conditions and other adverse geopolitical conditions can adversely affect and have in the past adversely affected investor and CEO confidence, resulting in significant industry-wide declines in the size and number of underwritings and of financial advisory transactions, which could have an adverse effect on our revenues and our profit margins. In particular, because a significant portion of our investment banking revenues is derived from our participation in large transactions, a decline in the number of large transactions would adversely affect our investment banking business.

In certain circumstances, market uncertainty or general declines in market or economic activity may affect our client execution businesses by decreasing levels of overall activity or by decreasing volatility, but at other times market uncertainty and even declining economic activity may result in higher trading volumes or higher spreads or both.

Market uncertainty, volatility and adverse economic conditions, as well as declines in asset values, may cause our clients to transfer their assets out of our funds or other products or their brokerage accounts and result in reduced net revenues, principally in our investment management business. Even if clients do not withdraw their funds, they may invest them in products that generate less fee income.

***Our investment management business may be affected by the poor investment performance of our investment products or a client preference for products other than those which we offer or for products that generate lower fees.***

Poor investment returns in our investment management business, due to either general market conditions or underperformance (relative to our competitors or to benchmarks) by funds or accounts that we manage or investment products that we design or sell, affects our ability to retain existing assets and to attract new clients or additional assets from existing clients. This could affect the management and incentive fees that we earn on assets under supervision or the commissions and net spreads that we earn for selling other investment products, such as structured notes or derivatives. To the extent that our clients choose to invest in products that we do not currently offer, we will suffer outflows and a loss of management fees. Further, if, due to changes in investor sentiment or the relative performance of certain asset classes or otherwise, clients invest in products that generate lower fees, our investment management business could be adversely affected.

***We may incur losses as a result of ineffective risk management processes and strategies.***

We seek to monitor and control our risk exposure through a risk and control framework encompassing a variety of separate but complementary financial, credit, operational, compliance and legal reporting systems, internal controls, management review processes and other mechanisms. Our risk management process seeks to balance our ability to profit from market-making, investing or lending positions, and underwriting activities, with our exposure to potential losses. While we employ a broad and diversified set of risk monitoring and risk mitigation techniques, those techniques and the judgments that accompany their application cannot anticipate every economic and financial outcome or the specifics and timing of such outcomes. Thus, we may, in the course of our activities, incur losses. Market conditions in recent years have involved unprecedented dislocations and highlight the limitations inherent in using historical data to manage risk.

The models that we use to assess and control our risk exposures reflect assumptions about the degrees of correlation or lack thereof among prices of various asset classes or other market indicators. In times of market stress or other unforeseen circumstances, such as those that occurred during 2008 and early 2009, and to some extent since 2011, previously uncorrelated indicators may become correlated, or conversely previously correlated indicators may move in different directions. These types of market movements have at times limited the effectiveness of our hedging strategies and have caused us to incur significant losses, and they may do so in the future. These changes in correlation can be exacerbated where other market participants are using risk or trading models with assumptions or algorithms that are similar to ours. In these and other cases, it may be difficult to reduce our risk positions due to the activity of other market participants or widespread market dislocations, including circumstances where asset values are declining significantly or no market exists for certain assets.

In addition, the use of models in connection with risk management and numerous other critical activities presents risks that such models may be ineffective, either because of poor design or ineffective testing, improper or flawed inputs, as well as unpermitted access to such models resulting in unapproved or malicious changes to the model or its inputs.

To the extent that we have positions through our market-making or origination activities or we make investments directly through our investing activities, including private equity, that do not have an established liquid trading market or are otherwise subject to restrictions on sale or hedging, we may not be able to reduce our positions and therefore reduce our risk associated with such positions. In addition, to the extent permitted by applicable law and regulation, we invest our own capital in private equity, credit, real estate and hedge funds that we manage and limitations on our ability to withdraw some or all of our investments in these funds, whether for legal, reputational or other reasons, may make it more difficult for us to control the risk exposures relating to these investments.

Prudent risk management, as well as regulatory restrictions, may cause us to limit our exposure to counterparties, geographic areas or markets, which may limit our business opportunities and increase the cost of our funding or hedging activities.

As we have expanded and intend to continue to expand the product and geographic scope of our offerings of credit products to consumers, we are presented with different credit risks and must expand and adapt our credit risk monitoring and mitigation activities to account for these new business activities. A failure to adequately assess and control such risk exposures could result in losses to us.

For further information about our risk management policies and procedures, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Risk Management” in Part II, Item 7 of this Form 10-K.

***Our liquidity, profitability and businesses may be adversely affected by an inability to access the debt capital markets or to sell assets or by a reduction in our credit ratings or by an increase in our credit spreads.***

Liquidity is essential to our businesses. It is of critical importance to us, as most of the failures of financial institutions have occurred in large part due to insufficient liquidity. Our liquidity may be impaired by an inability to access secured and/or unsecured debt markets, an inability to access funds from our subsidiaries or otherwise allocate liquidity optimally, an inability to sell assets or redeem our investments, or unforeseen outflows of cash or collateral. This situation may arise due to circumstances that we may be unable to control, such as a general market disruption or an operational problem that affects third parties or us, or even by the perception among market participants that we, or other market participants, are experiencing greater liquidity risk.

We employ structured products to benefit our clients and hedge our own risks. The financial instruments that we hold and the contracts to which we are a party are often complex, and these complex structured products often do not have readily available markets to access in times of liquidity stress. Our investing and lending activities may lead to situations where the holdings from these activities represent a significant portion of specific markets, which could restrict liquidity for our positions.

Further, our ability to sell assets may be impaired if there is not generally a liquid market for such assets, as well as in circumstances where other market participants are seeking to sell similar otherwise generally liquid assets at the same time, as is likely to occur in a liquidity or other market crisis or in response to changes to rules or regulations. In addition, financial institutions with which we interact may exercise set-off rights or the right to require additional collateral, including in difficult market conditions, which could further impair our liquidity.

Our credit ratings are important to our liquidity. A reduction in our credit ratings could adversely affect our liquidity and competitive position, increase our borrowing costs, limit our access to the capital markets or trigger our obligations under certain provisions in some of our trading and collateralized financing contracts. Under these provisions, counterparties could be permitted to terminate contracts with us or require us to post additional collateral. Termination of our trading and collateralized financing contracts could cause us to sustain losses and impair our liquidity by requiring us to find other sources of financing or to make significant cash payments or securities movements.

As of December 2018, our counterparties could have called for additional collateral or termination payments related to our net derivative liabilities under bilateral agreements in an aggregate amount of $262 million in the event of a one-notch downgrade of our credit ratings and $959 million in the event of a two-notch downgrade of our credit ratings. A downgrade by any one rating agency, depending on the agency’s relative ratings of us at the time of the downgrade, may have an impact which is comparable to the impact of a downgrade by all rating agencies. For further information about our credit ratings, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations — Risk Management — Liquidity Risk Management — Credit Ratings” in Part II, Item 7 of this Form 10-K.

Our cost of obtaining long-term unsecured funding is directly related to our credit spreads (the amount in excess of the interest rate of U.S. Treasury securities (or other benchmark securities) of the same maturity that we need to pay to our debt investors). Increases in our credit spreads can significantly increase our cost of this funding. Changes in credit spreads are continuous, market-driven, and subject at times to unpredictable and highly volatile movements. Our credit spreads are also influenced by market perceptions of our creditworthiness. In addition, our credit spreads may be influenced by movements in the costs to purchasers of credit default swaps referenced to our long-term debt. The market for credit default swaps has proven to be extremely volatile and at times has lacked a high degree of transparency or liquidity.

Regulatory changes relating to liquidity may also negatively impact our results of operations and competitive position. Recently, numerous regulations have been adopted or proposed to introduce more stringent liquidity requirements for large financial institutions. These regulations address, among other matters, liquidity stress testing, minimum liquidity requirements, wholesale funding, limitations on the issuance of short-term debt and structured notes and prohibitions on parent guarantees that are subject to certain cross-defaults. New and prospective liquidity-related regulations may overlap with, and be impacted by, other regulatory changes, including rules relating to minimum long-term debt requirements and TLAC, guidance on the treatment of brokered deposits and the capital, leverage and resolution and recovery frameworks applicable to large financial institutions. Given the overlap and complex interactions among these new and prospective regulations, they may have unintended cumulative effects, and their full impact will remain uncertain, while regulatory reforms are being adopted and market practices develop in response to such reforms.

***A failure to appropriately identify and address potential conflicts of interest could adversely affect our businesses.***

Due to the broad scope of our businesses and our client base, we regularly address potential conflicts of interest, including situations where our services to a particular client or our own investments or other interests conflict, or are perceived to conflict, with the interests of another client, as well as situations where one or more of our businesses have access to material non-public information that may not be shared with our other businesses and situations where we may be a creditor of an entity with which we also have an advisory or other relationship.

In addition, our status as a BHC subjects us to heightened regulation and increased regulatory scrutiny by the FRB with respect to transactions between GS Bank USA and entities that are or could be viewed as affiliates of ours and, under the Volcker Rule, transactions between Goldman Sachs and certain covered funds.

We have extensive procedures and controls that are designed to identify and address conflicts of interest, including those designed to prevent the improper sharing of information among our businesses. However, appropriately identifying and dealing with conflicts of interest is complex and difficult, and our reputation, which is one of our most important assets, could be damaged and the willingness of clients to enter into transactions with us may be affected if we fail, or appear to fail, to identify, disclose and deal appropriately with conflicts of interest. In addition, potential or perceived conflicts could give rise to litigation or regulatory enforcement actions.

***A failure in our operational systems or infrastructure, or those of third parties, as well as human error or malfeasance, could impair our liquidity, disrupt our businesses, result in the disclosure of confidential information, damage our reputation and cause losses.***

Our businesses are highly dependent on our ability to process and monitor, on a daily basis, a very large number of transactions, many of which are highly complex and occur at high volumes and frequencies, across numerous and diverse markets in many currencies. These transactions, as well as the information technology services we provide to clients, often must adhere to client-specific guidelines, as well as legal and regulatory standards.

Many rules and regulations worldwide govern our obligations to execute transactions and report such transactions and other information to regulators, exchanges and investors. Compliance with these legal and reporting requirements can be challenging, and we have been, and may in the future be, subject to regulatory fines and penalties for failing to follow these rules or to report timely, accurate and complete information in accordance with such rules. As such requirements expand, compliance with these rules and regulations has become more challenging.

As our client base, including through our consumer businesses, and our geographical reach expand and the volume, speed, frequency and complexity of transactions, especially electronic transactions (as well as the requirements to report such transactions on a real-time basis to clients, regulators and exchanges) increase, developing and maintaining our operational systems and infrastructure becomes more challenging, and the risk of systems or human error in connection with such transactions increases, as well as the potential consequences of such errors due to the speed and volume of transactions involved and the potential difficulty associated with discovering such errors quickly enough to limit the resulting consequences.

Our financial, accounting, data processing or other operational systems and facilities may fail to operate properly or become disabled as a result of events that are wholly or partially beyond our control, such as a spike in transaction volume, adversely affecting our ability to process these transactions or provide these services. We must continuously update these systems to support our operations and growth and to respond to changes in regulations and markets, and invest heavily in systemic controls and training to ensure that such transactions do not violate applicable rules and regulations or, due to errors in processing such transactions, adversely affect markets, our clients and counterparties or us.

Enhancements and updates to systems, as well as the requisite training, including in connection with the integration of new businesses, entail significant costs and create risks associated with implementing new systems and integrating them with existing ones.

The use of computing devices and phones is critical to the work done by our employees and the operation of our systems and businesses and those of our clients and our third-party service providers and vendors. Fundamental security flaws in computer chips found in many types of these computing devices and phones have been reported in the past and may be discovered in the future. Addressing this and similar issues could be costly and affect the performance of these businesses and systems, and operational risks may be incurred in applying fixes and there may still be residual security risks.

Additionally, although the prevalence and scope of applications of distributed ledger technology and similar technologies is growing, the technology is also nascent and may be vulnerable to cyber attacks or have other inherent weaknesses. We may be, or may become, exposed to risks related to distributed ledger technology through our facilitation of clients' activities involving financial products linked to distributed ledger technology, such as blockchain or cryptocurrencies, our investments in companies that seek to develop platforms based on distributed ledger technology, and the use of distributed ledger technology by third-party vendors, clients, counterparties, clearing houses and other financial intermediaries.

Notwithstanding the proliferation of technology and technology-based risk and control systems, our businesses ultimately rely on people as our greatest resource, and, from time-to-time, they make mistakes or engage in violations of applicable policies, laws, rules or procedures that are not always caught immediately by our technological processes or by our controls and other procedures, which are intended to prevent and detect such errors or violations. These can include calculation errors, mistakes in addressing emails, errors in software or model development or implementation, or simple errors in judgment, as well as intentional efforts to ignore or circumvent applicable policies, laws, rules or procedures. Human errors and malfeasance, even if promptly discovered and remediated, can result in material losses and liabilities for us.

In addition, we face the risk of operational failure or significant operational delay, termination or capacity constraints of any of the clearing agents, exchanges, clearing houses or other financial intermediaries we use to facilitate our securities and derivatives transactions, and as our interconnectivity with our clients grows, we increasingly face the risk of operational failure or significant operational delay with respect to our clients' systems.

In recent years, there has been significant consolidation among clearing agents, exchanges and clearing houses and an increasing number of derivative transactions are now or in the near future will be cleared on exchanges, which has increased our exposure to operational failure or significant operational delay, termination or capacity constraints of the particular financial intermediaries that we use and could affect our ability to find adequate and cost-effective alternatives in the event of any such failure, delay, termination or constraint. Industry consolidation, whether among market participants or financial intermediaries, increases the risk of operational failure or significant operational delay as disparate complex systems need to be integrated, often on an accelerated basis.

Furthermore, the interconnectivity of multiple financial institutions with central agents, exchanges and clearing houses, and the increased centrality of these entities, increases the risk that an operational failure at one institution or entity may cause an industry-wide operational failure that could materially impact our ability to conduct business. Any such failure, termination or constraint could adversely affect our ability to effect transactions, service our clients, manage our exposure to risk or expand our businesses or result in financial loss or liability to our clients, impairment of our liquidity, disruption of our businesses, regulatory intervention or reputational damage.

Despite the resiliency plans and facilities we have in place, our ability to conduct business may be adversely impacted by a disruption in the infrastructure that supports our businesses and the communities in which we are located. This may include a disruption involving electrical, satellite, undersea cable or other communications, internet, transportation or other services facilities used by us, our employees or third parties with which we conduct business, including cloud service providers. These disruptions may occur as a result of events that affect only our buildings or systems or those of such third parties, or as a result of events with a broader impact globally, regionally or in the cities where those buildings or systems are located, including, but not limited to, natural disasters, war, civil unrest, terrorism, economic or political developments, pandemics and weather events.

In addition, although we seek to diversify our third-party vendors to increase our resiliency, we are also exposed to the risk that a disruption or other information technology event at a common service provider to our vendors could impede their ability to provide products or services to us. We may not be able to effectively monitor or mitigate operational risks relating to our vendors' use of common service providers.

Nearly all of our employees in our primary locations, including the New York metropolitan area, London, Bengaluru, Hong Kong, Tokyo and Salt Lake City, work in close proximity to one another, in one or more buildings. Notwithstanding our efforts to maintain business continuity, given that our headquarters and the largest concentration of our employees are in the New York metropolitan area, and our two principal office buildings in the New York area both are located on the waterfront of the Hudson River, depending on the intensity and longevity of the event, a catastrophic event impacting our New York metropolitan area offices, including a terrorist attack, extreme weather event or other hostile or catastrophic event, could negatively affect our business. If a disruption occurs in one location and our employees in that location are unable to occupy our offices or communicate with or travel to other locations, our ability to service and interact with our clients may suffer, and we may not be able to successfully implement contingency plans that depend on communication or travel.

***A failure to protect our computer systems, networks and information, and our clients' information, against cyber attacks and similar threats could impair our ability to conduct our businesses, result in the disclosure, theft or destruction of confidential information, damage our reputation and cause losses.***

Our operations rely on the secure processing, storage and transmission of confidential and other information in our computer systems and networks. There have been a number of highly publicized cases involving financial services companies, consumer-based companies, governmental agencies and other organizations reporting the unauthorized disclosure of client, customer or other confidential information in recent years, as well as cyber attacks involving the dissemination, theft and destruction of corporate information or other assets, as a result of failure to follow procedures by employees or contractors or as a result of actions by third parties, including actions by foreign governments. There have also been several highly publicized cases where hackers have requested "ransom" payments in exchange for not disclosing customer information or for restoring access to information or systems.

We are regularly the target of attempted cyber attacks, including denial-of-service attacks, and must continuously monitor and develop our systems to protect our technology infrastructure and data from misappropriation or corruption. We may face an increasing number of attempted cyber attacks as we expand our mobile- and other internet-based products and services, as well as our usage of mobile and cloud technologies and as we provide more of these services to a greater number of individual consumers. The increasing migration of firm communication and other platforms from firm-provided devices to employee-owned devices presents additional risks of cyber attacks. In addition, due to our interconnectivity with third-party vendors (and their respective service providers), central agents, exchanges, clearing houses and other financial institutions, we could be adversely impacted if any of them is subject to a successful cyber attack or other information security event. These effects could include the loss of access to information or services from the third party subject to the cyber attack or other information security event, which could, in turn, interrupt certain of our businesses.

Despite our efforts to ensure the integrity of our systems and information, we may not be able to anticipate, detect or implement effective preventive measures against all cyber threats, especially because the techniques used are increasingly sophisticated, change frequently and are often not recognized until launched. Cyber attacks can originate from a variety of sources, including third parties who are affiliated with or sponsored by foreign governments or are involved with organized crime or terrorist organizations. Third parties may also attempt to place individuals within the firm or induce employees, clients or other users of our systems to disclose sensitive information or provide access to our data or that of our clients, and these types of risks may be difficult to detect or prevent.

Although we take protective measures and endeavor to modify them as circumstances warrant, our computer systems, software and networks may be vulnerable to unauthorized access, misuse, computer viruses or other malicious code, cyber attacks on our vendors and other events that could have a security impact. Due to the complexity and interconnectedness of our systems, the process of enhancing our protective measures can itself create a risk of systems disruptions and security issues.

If one or more of such events occur, this potentially could jeopardize our or our clients' or counterparties' confidential and other information processed and stored in, and transmitted through, our computer systems and networks, or otherwise cause interruptions or malfunctions in our, our clients', our counterparties' or third parties' operations, which could impact their ability to transact with us or otherwise result in legal or regulatory action, significant losses or reputational damage. In addition, such an event could persist for an extended period of time before being detected, and, following detection, it could take considerable time for us to obtain full and reliable information about the extent, amount and type of information compromised. During the course of an investigation, we may not know the full impact of the event and how to remediate it, and actions, decisions and mistakes that are taken or made may further increase the negative effects of the event on our business, results of operations and reputation.

The increased use of mobile and cloud technologies can heighten these and other operational risks. We expect to expend significant additional resources on an ongoing basis to modify our protective measures and to investigate and remediate vulnerabilities or other exposures, but these measures may be ineffective and we may be subject to legal or regulatory action, and financial losses that are either not insured against or not fully covered through any insurance maintained by us. Certain aspects of the security of such technologies are unpredictable or beyond our control, and the failure by mobile technology and cloud service providers to adequately safeguard their systems and prevent cyber attacks could disrupt our operations and result in misappropriation, corruption or loss of confidential and other information. In addition, there is a risk that encryption and other protective measures, despite their sophistication, may be defeated, particularly to the extent that new computing technologies vastly increase the speed and computing power available.

We routinely transmit and receive personal, confidential and proprietary information by email and other electronic means. We have discussed and worked with clients, vendors, service providers, counterparties and other third parties to develop secure transmission capabilities and protect against cyber attacks, but we do not have, and may be unable to put in place, secure capabilities with all of our clients, vendors, service providers, counterparties and other third parties and we may not be able to ensure that these third parties have appropriate controls in place to protect the confidentiality of the information. An interception, misuse or mishandling of personal, confidential or proprietary information being sent to or received from a client, vendor, service provider, counterparty or other third party could result in legal liability, regulatory action and reputational harm.

***Group Inc. is a holding company and is dependent for liquidity on payments from its subsidiaries, many of which are subject to restrictions.***

Group Inc. is a holding company and, therefore, depends on dividends, distributions and other payments from its subsidiaries to fund dividend payments and to fund all payments on its obligations, including debt obligations. Many of our subsidiaries, including our broker-dealer and bank subsidiaries, are subject to laws that restrict dividend payments or authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to Group Inc.

In addition, our broker-dealer and bank subsidiaries are subject to restrictions on their ability to lend or transact with affiliates and to minimum regulatory capital and other requirements, as well as restrictions on their ability to use funds deposited with them in brokerage or bank accounts to fund their businesses. Additional restrictions on related-party transactions, increased capital and liquidity requirements and additional limitations on the use of funds on deposit in bank or brokerage accounts, as well as lower earnings, can reduce the amount of funds available to meet the obligations of Group Inc., including under the FRB's source of strength requirement, and even require Group Inc. to provide additional funding to such subsidiaries. Restrictions or regulatory action of that kind could impede access to funds that Group Inc. needs to make payments on its obligations, including debt obligations, or dividend payments. In addition, Group Inc.'s right to participate in a distribution of assets upon a subsidiary's liquidation or reorganization is subject to the prior claims of the subsidiary's creditors.

There has been a trend towards increased regulation and supervision of our subsidiaries by the governments and regulators in the countries in which those subsidiaries are located or do business. Concerns about protecting clients and creditors of financial institutions that are controlled by persons or entities located outside of the country in which such entities are located or do business have caused or may cause a number of governments and regulators to take additional steps to "ring fence" or require internal total loss-absorbing capacity at such entities in order to protect clients and creditors of such entities in the event of financial difficulties involving such entities. The result has been and may continue to be additional limitations on our ability to efficiently move capital and liquidity among our affiliated entities, thereby increasing the overall level of capital and liquidity required by us on a consolidated basis.

Furthermore, Group Inc. has guaranteed the payment obligations of certain of its subsidiaries, including GS&Co. and GS Bank USA, subject to certain exceptions. In addition, Group Inc. guarantees many of the obligations of its other consolidated subsidiaries on a transaction-by-transaction basis, as negotiated with counterparties. These guarantees may require Group Inc. to provide substantial funds or assets to its subsidiaries or their creditors or counterparties at a time when Group Inc. is in need of liquidity to fund its own obligations.

The requirements for Group Inc. and GS Bank USA to develop and submit recovery and resolution plans to regulators, and the incorporation of feedback received from regulators, may require us to increase capital or liquidity levels or issue additional long-term debt at Group Inc. or particular subsidiaries or otherwise incur additional or duplicative operational or other costs at multiple entities, and may reduce our ability to provide Group Inc. guarantees of the obligations of our subsidiaries or raise debt at Group Inc. Resolution planning may also impair our ability to structure our intercompany and external activities in a manner that we may otherwise deem most operationally efficient. Furthermore, arrangements to facilitate our resolution planning may cause us to be subject to additional taxes. Any such limitations or requirements would be in addition to the legal and regulatory restrictions described above on our ability to engage in capital actions or make intercompany dividends or payments.

See "Business — Regulation" in Part I, Item 1 of this Form 10-K for further information about regulatory restrictions.

***The application of regulatory strategies and requirements in the U.S. and non-U.S. jurisdictions to facilitate the orderly resolution of large financial institutions could create greater risk of loss for Group Inc.'s security holders.***

As described in "Business — Regulation — Banking Supervision and Regulation — Insolvency of an Insured Depository Institution or a Bank Holding Company," if the FDIC is appointed as receiver under OLA, the rights of Group Inc.'s creditors would be determined under OLA, and substantial differences exist in the rights of creditors between OLA and the U.S. Bankruptcy Code, including the right of the FDIC under OLA to disregard the strict priority of creditor claims in some circumstances, which could have a material adverse effect on debtholders.

The FDIC has announced that a single point of entry strategy may be a desirable strategy under OLA to resolve a large financial institution such as Group Inc. in a manner that would, among other things, impose losses on shareholders, debtholders and other creditors of the top-tier BHC (in our case, Group Inc.), while the BHC's subsidiaries may continue to operate. It is possible that the application of the single point of entry strategy under OLA, in which Group Inc. would be the only entity to enter resolution proceedings (and its material broker-dealer, bank and other operating entities would not enter resolution proceedings), would result in greater losses to Group Inc.'s security holders (including holders of our fixed rate, floating rate and indexed debt securities), than the losses that would result from the application of a bankruptcy proceeding or a different resolution strategy, such as a multiple point of entry resolution strategy for Group Inc. and certain of its material subsidiaries.

Assuming Group Inc. entered resolution proceedings and that support from Group Inc. to its subsidiaries was sufficient to enable the subsidiaries to remain solvent, losses at the subsidiary level would be transferred to Group Inc. and ultimately borne by Group Inc.'s security holders, third-party creditors of Group Inc.'s subsidiaries would receive full recoveries on their claims, and Group Inc.'s security holders (including our shareholders, debtholders and other unsecured creditors) could face significant and possibly complete losses. In that case, Group Inc.'s security holders would face losses while the third-party creditors of Group Inc.'s subsidiaries would incur no losses because the subsidiaries would continue to operate and would not enter resolution or bankruptcy proceedings. In addition, holders of Group Inc.'s eligible long-term debt and holders of Group Inc.'s other debt securities could face losses ahead of its other similarly situated creditors in a resolution under OLA if the FDIC exercised its right, described above, to disregard the priority of creditor claims.

OLA also provides the FDIC with authority to cause creditors and shareholders of the financial company (such as Group Inc.) in receivership to bear losses before taxpayers are exposed to such losses, and amounts owed to the U.S. government would generally receive a statutory payment priority over the claims of private creditors, including senior creditors.

In addition, under OLA, claims of creditors (including debtholders) could be satisfied through the issuance of equity or other securities in a bridge entity to which Group Inc.'s assets are transferred. If such a securities-for-claims exchange were implemented, there can be no assurance that the value of the securities of the bridge entity would be sufficient to repay or satisfy all or any part of the creditor claims for which the securities were exchanged. While the FDIC has issued regulations to implement OLA, not all aspects of how the FDIC might exercise this authority are known and additional rulemaking is possible.

In addition, certain jurisdictions, including the U.K. and the E.U., have implemented, or are considering, changes to resolution regimes to provide resolution authorities with the ability to recapitalize a failing entity by writing down its unsecured debt or converting its unsecured debt into equity. Such "bail-in" powers are intended to enable the recapitalization of a failing institution by allocating losses to its shareholders and unsecured debtholders. If the intercompany funding we provide to our subsidiaries is "bailed in," Group Inc.'s claims on its subsidiaries would be subordinated to the claims of the subsidiaries' third-party creditors or written down. U.S. regulators are considering and non-U.S. authorities have adopted requirements that certain subsidiaries of large financial institutions maintain minimum amounts of total loss-absorbing capacity that would pass losses up from the subsidiaries to the top-tier BHC and, ultimately, to security holders of the top-tier BHC in the event of failure.

***The application of Group Inc.'s proposed resolution strategy could result in greater losses for Group Inc.'s security holders.***

In our resolution plan, Group Inc. would be resolved under the U.S. Bankruptcy Code. The strategy described in our resolution plan is a variant of the single point of entry strategy: Group Inc. and Goldman Sachs Funding LLC (Funding IHC), a wholly-owned, direct subsidiary of Group Inc., would recapitalize and provide liquidity to certain major subsidiaries, including through the forgiveness of intercompany indebtedness, the extension of the maturities of intercompany indebtedness and the extension of additional intercompany loans. If this strategy were successful, creditors of some or all of Group Inc.'s major subsidiaries would receive full recoveries on their claims, while Group Inc.'s security holders could face significant and possibly complete losses.

To facilitate the execution of our resolution plan, we formed Funding IHC. In exchange for an unsecured subordinated funding note and equity interest, Group Inc. transferred certain intercompany receivables and substantially all of its global core liquid assets (GCLA) to Funding IHC, and agreed to transfer additional GCLA above prescribed thresholds.

We also put in place a Capital and Liquidity Support Agreement (CLSA) among Group Inc., Funding IHC and our major subsidiaries. Under the CLSA, Funding IHC has provided Group Inc. with a committed line of credit that allows Group Inc. to draw sufficient funds to meet its cash needs during the ordinary course of business. In addition, if our financial resources deteriorate so severely that resolution may be imminent, (i) the committed line of credit will automatically terminate and the unsecured subordinated funding note will automatically be forgiven, (ii) all intercompany receivables owed by the major subsidiaries to Group Inc. will be transferred to Funding IHC or their maturities will be extended to five years, (iii) Group Inc. will be obligated to transfer substantially all of its remaining intercompany receivables and GCLA (other than an amount to fund anticipated bankruptcy expenses) to Funding IHC, and (iv) Funding IHC will be obligated to provide capital and liquidity support to the major subsidiaries. Group Inc.'s and Funding IHC's obligations under the CLSA are secured pursuant to a related security agreement. Such actions would materially and adversely affect Group Inc.'s liquidity. As a result, during a period of severe stress, Group Inc. might commence bankruptcy proceedings at an earlier time than it otherwise would if the CLSA and related security agreement had not been implemented.

If Group Inc.'s proposed resolution strategy were successful, Group Inc.'s security holders could face losses while the third-party creditors of Group Inc.'s major subsidiaries would incur no losses because those subsidiaries would continue to operate and not enter resolution or bankruptcy proceedings. As part of the strategy, Group Inc. could also seek to elevate the priority of its guarantee obligations relating to its major subsidiaries' derivative contracts or transfer them to another entity so that cross-default and early termination rights would be stayed under the ISDA Universal Protocol or U.S. ISDA Protocol (ISDA Protocols), as applicable, which would result in holders of Group Inc.'s eligible long-term debt and holders of Group Inc.'s other debt securities incurring losses ahead of the beneficiaries of those guarantee obligations. It is also possible that holders of Group Inc.'s eligible long-term debt and other debt securities could incur losses ahead of other similarly situated creditors.

If Group Inc.'s proposed resolution strategy were not successful, Group Inc.'s financial condition would be adversely impacted and Group Inc.'s security holders, including debtholders, may as a consequence be in a worse position than if the strategy had not been implemented. In all cases, any payments to debtholders are dependent on our ability to make such payments and are therefore subject to our credit risk.

As a result of our recovery and resolution planning processes, including incorporating feedback from our regulators, we may incur increased operational, funding or other costs and face limitations on our ability to structure our internal organization or engage in internal or external activities in a manner that we may otherwise deem most operationally efficient.

***Our businesses, profitability and liquidity may be adversely affected by Brexit.***

In March 2017, the U.K. notified the European Council of its decision to leave the E.U. (Brexit). As discussed in "Business — Regulation" in Part I, Item 1 of this Form 10-K there is considerable uncertainty as to the regulatory framework that will govern transactions and business undertaken by our U.K. subsidiaries in the E.U., both in the near term and the long term. As a result, we face numerous risks that could adversely affect how we conduct our businesses or our profitability and liquidity.

Our principal E.U. operating subsidiaries, GSI, GSIB and GSAMI, are incorporated and headquartered in the U.K. They all currently benefit from non-discriminatory access to E.U. clients and infrastructure based on E.U. treaties and E.U. legislation, including arrangements for cross-border "passporting" and the establishment of E.U. branches. Because the Withdrawal Agreement has not been ratified by the U.K. and E.U. Parliaments, it is uncertain whether GSI, GSIB and GSAMI will continue to benefit from the existing access arrangements for financial services following March 29, 2019, the date on which the U.K. is scheduled to leave the E.U. Further, even if the Withdrawal Agreement is ratified, there is uncertainty regarding the terms of the long-term trading relationship between the E.U. and the U.K., including the terms of access to each other's financial markets.

In a hard Brexit scenario or as otherwise necessary, our German bank subsidiary, GSBE, will act as our main operating subsidiary in the E.U. and will assume certain functions that can no longer be efficiently and effectively performed by our U.K. operating subsidiaries, including GSI, GSIB and GSAMI. Implementing this strategy could materially adversely affect the manner in which we operate certain businesses in Europe, require us to restructure certain of our operations and expose us to higher operational, regulatory and compliance costs, higher taxes, higher subsidiary-level capital and liquidity requirements, additional restrictions on intercompany transactions, and new restrictions on the ability of our subsidiaries to share personal data, including client data, all of which could adversely affect our liquidity and profitability.

GSBE has not been one of our main operating subsidiaries in the E.U. Depending on the outcome, Brexit could necessitate a rapid and significant expansion in the scope of GSBE's activities, as well as its headcount, balance sheet, and capital and funding needs. Although we have invested significant resources to plan for and address Brexit, there can be no assurance that we will be able to successfully execute our strategy. In addition, even if we are able to successfully execute our strategy, we face the risk that Brexit could have a disproportionately adverse effect on our E.U operations compared to some of our competitors who have more extensive pre-existing operations in the E.U. outside of the U.K.

In addition, Brexit has created an uncertain political and economic environment in the U.K., and may create such environments in other E.U. member states. Political and economic uncertainty has in the past led to, and the outcome of Brexit could lead to, declines in market liquidity and activity levels, volatile market conditions, a contraction of available credit, changes in interest rates or exchange rates, weaker economic growth and reduced business confidence all of which could adversely impact our business.

***Our businesses, profitability and liquidity may be adversely affected by deterioration in the credit quality of, or defaults by, third parties who owe us money, securities or other assets or whose securities or obligations we hold.***

We are exposed to the risk that third parties that owe us money, securities or other assets will not perform their obligations. These parties may default on their obligations to us due to bankruptcy, lack of liquidity, operational failure or other reasons. A failure of a significant market participant, or even concerns about a default by such an institution, could lead to significant liquidity problems, losses or defaults by other institutions, which in turn could adversely affect us.

We are also subject to the risk that our rights against third parties may not be enforceable in all circumstances. In addition, deterioration in the credit quality of third parties whose securities or obligations we hold, including a deterioration in the value of collateral posted by third parties to secure their obligations to us under derivative contracts and loan agreements, could result in losses and/or adversely affect our ability to rehypothecate or otherwise use those securities or obligations for liquidity purposes.

A significant downgrade in the credit ratings of our counterparties could also have a negative impact on our results. While in many cases we are permitted to require additional collateral from counterparties that experience financial difficulty, disputes may arise as to the amount of collateral we are entitled to receive and the value of pledged assets. The termination of contracts and the foreclosure on collateral may subject us to claims for the improper exercise of our rights. Default rates, downgrades and disputes with counterparties as to the valuation of collateral increase significantly in times of market stress, increased volatility and illiquidity.

As part of our clearing and prime brokerage activities, we finance our clients' positions, and we could be held responsible for the defaults or misconduct of our clients. Although we regularly review credit exposures to specific clients and counterparties and to specific industries, countries and regions that we believe may present credit concerns, default risk may arise from events or circumstances that are difficult to detect or foresee.

***Concentration of risk increases the potential for significant losses in our market-making, underwriting, investing and lending activities.***

Concentration of risk increases the potential for significant losses in our market-making, underwriting, investing and lending activities. The number and size of such transactions may affect our results of operations in a given period. Moreover, because of concentration of risk, we may suffer losses even when economic and market conditions are generally favorable for our competitors. Disruptions in the credit markets can make it difficult to hedge these credit exposures effectively or economically. In addition, we extend large commitments as part of our credit origination activities.

Rules adopted under the Dodd-Frank Act, and similar rules adopted in other jurisdictions, require issuers of certain asset-backed securities and any person who organizes and initiates certain asset-backed securities transactions to retain economic exposure to the asset, which has affected the cost of and structures used in connection with these securitization activities. Our inability to reduce our credit risk by selling, syndicating or securitizing these positions, including during periods of market stress, could negatively affect our results of operations due to a decrease in the fair value of the positions, including due to the insolvency or bankruptcy of the borrower, as well as the loss of revenues associated with selling such securities or loans.

In the ordinary course of business, we may be subject to a concentration of credit risk to a particular counterparty, borrower, issuer, including sovereign issuers, or geographic area or group of related countries, such as the E.U., and a failure or downgrade of, or default by, such entity could negatively impact our businesses, perhaps materially, and the systems by which we set limits and monitor the level of our credit exposure to individual entities, industries and countries may not function as we have anticipated. Regulatory reform, including the Dodd-Frank Act, has led to increased centralization of trading activity through particular clearing houses, central agents or exchanges, which has significantly increased our concentration of risk with respect to these entities. While our activities expose us to many different industries, counterparties and countries, we routinely execute a high volume of transactions with counterparties engaged in financial services activities, including brokers and dealers, commercial banks, clearing houses, exchanges and investment funds. This has resulted in significant credit concentration with respect to these counterparties.

***The financial services industry is both highly competitive and interrelated.***

The financial services industry and all of our businesses are intensely competitive, and we expect them to remain so. We compete on the basis of a number of factors, including transaction execution, our products and services, innovation, reputation, creditworthiness and price. There has been substantial consolidation and convergence among companies in the financial services industry. This consolidation and convergence has hastened the globalization of the securities and other financial services markets. As a result, we have had to commit capital to support our international operations and to execute large global transactions. To the extent we expand into new business areas and new geographic regions, we will face competitors with more experience and more established relationships with clients, regulators and industry participants in the relevant market, which could adversely affect our ability to expand.

Governments and regulators have recently adopted regulations, imposed taxes, adopted compensation restrictions or otherwise put forward various proposals that have or may impact our ability to conduct certain of our businesses in a cost-effective manner or at all in certain or all jurisdictions, including proposals relating to restrictions on the type of activities in which financial institutions are permitted to engage. These or other similar rules, many of which do not apply to all our U.S. or non-U.S. competitors, could impact our ability to compete effectively.

Pricing and other competitive pressures in our businesses have continued to increase, particularly in situations where some of our competitors may seek to increase market share by reducing prices. For example, in connection with investment banking and other assignments, in response to competitive pressure we have experienced, we have extended and priced credit at levels that may not always fully compensate us for the risks we take.

The financial services industry is highly interrelated in that a significant volume of transactions occur among a limited number of members of that industry. Many transactions are syndicated to other financial institutions and financial institutions are often counterparties in transactions. This has led to claims by other market participants and regulators that such institutions have colluded in order to manipulate markets or market prices, including allegations that antitrust laws have been violated. While we have extensive procedures and controls that are designed to identify and prevent such activities, allegations of such activities, particularly by regulators, can have a negative reputational impact and can subject us to large fines and settlements, and potentially significant penalties, including treble damages.

***We face enhanced risks as new business initiatives lead us to transact with a broader array of clients and counterparties and expose us to new asset classes and new markets.***

A number of our recent and planned business initiatives and expansions of existing businesses may bring us into contact, directly or indirectly, with individuals and entities that are not within our traditional client and counterparty base and expose us to new asset classes and new markets. For example, we continue to transact business and invest in new regions, including a wide range of emerging and growth markets. Furthermore, in a number of our businesses, including where we make markets, invest and lend, we directly or indirectly own interests in, or otherwise become affiliated with the ownership and operation of public services, such as airports, toll roads and shipping ports, as well as physical commodities and commodities infrastructure components, both within and outside the U.S.

We have increased and intend to further increase our consumer-oriented deposit-taking and lending activities. To the extent we engage in such activities or similar consumer-oriented activities, we could face additional compliance, legal and regulatory risk, increased reputational risk and increased operational risk due to, among other things, higher transaction volumes and significantly increased retention and transmission of customer and client information. As a result of a recent information security event involving a credit reporting agency, identity fraud may increase and industry practices may change in a manner that makes it more difficult for financial institutions, such as us, to evaluate the creditworthiness of consumers.

New business initiatives expose us to new and enhanced risks, including risks associated with dealing with governmental entities, reputational concerns arising from dealing with less sophisticated clients, counterparties and investors, greater regulatory scrutiny of these activities, increased credit-related, market, sovereign and operational risks, risks arising from accidents or acts of terrorism, and reputational concerns with the manner in which certain assets are being operated or held or in which we interact with these counterparties. Legal, regulatory and reputational risks may also exist in connection with activities and transactions involving new products or markets where there is regulatory uncertainty or where there are different or conflicting regulations depending on the regulator or the jurisdiction involved, particularly where transactions in such products may involve multiple jurisdictions.

In recent years, we have invested, and may continue to invest, more in businesses that we expect will generate a higher level of more consistent revenues. Such investments may not be successful or have returns similar to our other businesses.

***Our results may be adversely affected by the composition of our client base.***

Our client base is not the same as that of our major competitors. Our businesses may have a higher or lower percentage of clients in certain industries or markets than some or all of our competitors. Therefore, unfavorable industry developments or market conditions affecting certain industries or markets may result in our businesses underperforming relative to similar businesses of a competitor if our businesses have a higher concentration of clients in such industries or markets. For example, our market-making businesses have a higher percentage of clients with actively managed assets than our competitors and such clients have been disproportionately affected during recent periods of low volatility.

Correspondingly, favorable or simply less adverse developments or market conditions involving industries or markets in a business where we have a lower concentration of clients in such industry or market may also result in our underperforming relative to a similar business of a competitor that has a higher concentration of clients in such industry or market. For example, we have a smaller corporate client base in our market-making businesses than many of our peers and therefore such competitors may benefit more from increased activity by corporate clients.

***Derivative transactions and delayed settlements may expose us to unexpected risk and potential losses.***

We are party to a large number of derivative transactions, including credit derivatives. Many of these derivative instruments are individually negotiated and non-standardized, which can make exiting, transferring or settling positions difficult. Many credit derivatives require that we deliver to the counterparty the underlying security, loan or other obligation in order to receive payment. In a number of cases, we do not hold the underlying security, loan or other obligation and may not be able to obtain the underlying security, loan or other obligation. This could cause us to forfeit the payments due to us under these contracts or result in settlement delays with the attendant credit and operational risk, as well as increased costs to us.

Derivative transactions may also involve the risk that documentation has not been properly executed, that executed agreements may not be enforceable against the counterparty, or that obligations under such agreements may not be able to be "netted" against other obligations with such counterparty. In addition, counterparties may claim that such transactions were not appropriate or authorized.

As a signatory to the ISDA Protocols and being subject to the FRB's and FDIC's rules on QFCs and similar rules in other jurisdictions, we may not be able to exercise remedies against counterparties and, as this new regime has not yet been tested, we may suffer risks or losses that we would not have expected to suffer if we could immediately close out transactions upon a termination event. Various non-U.S. regulators have also proposed regulations contemplated by the ISDA Universal Protocol, and those implementing regulations may result in additional limitations on our ability to exercise remedies against counterparties. The impact of the ISDA Protocols and these rules and regulations will depend on the development of market practices and structures, and they extend to repurchase agreements and other instruments that are not derivative contracts.

Derivative contracts and other transactions, including secondary bank loan purchases and sales, entered into with third parties are not always confirmed by the counterparties or settled on a timely basis. While the transaction remains unconfirmed or during any delay in settlement, we are subject to heightened credit and operational risk and in the event of a default may find it more difficult to enforce our rights.

In addition, as new complex derivative products are created, covering a wider array of underlying credit and other instruments, disputes about the terms of the underlying contracts could arise, which could impair our ability to effectively manage our risk exposures from these products and subject us to increased costs. The provisions of the Dodd-Frank Act requiring central clearing of credit derivatives and other OTC derivatives, or a market shift toward standardized derivatives, could reduce the risk associated with such transactions, but under certain circumstances could also limit our ability to develop derivatives that best suit the needs of our clients and to hedge our own risks, and could adversely affect our profitability and increase our credit exposure to central clearing platforms.

***Certain of our businesses, our funding and financial products may be adversely affected by changes in or the discontinuance of Interbank Offered Rates (IBORs), in particular LIBOR.***

The FCA, which regulates LIBOR, has announced that it will not compel panel banks to contribute to LIBOR after 2021. It is likely that banks will not continue to provide submissions for the calculation of LIBOR after 2021 and possibly prior to then. Similarly, it is not possible to know whether LIBOR will continue to be viewed as an acceptable market benchmark, what rate or rates may become accepted alternatives to LIBOR, or what the effect of any such changes in views or alternatives may have on the financial markets for LIBOR-linked financial instruments. Similar statements have been made with respect to other IBORs.

Uncertainty regarding IBORs and the taking of discretionary actions or negotiation of fallback provisions could result in pricing volatility, loss of market share in certain products, adverse tax or accounting impacts, compliance, legal and operational costs and risks associated with client disclosures, as well as systems disruption, model disruption and other business continuity issues. In addition, uncertainty relating to IBORs could result in increased capital requirements for the firm given potential low transaction volumes, a lack of liquidity or limited observability for exposures linked to IBORs or any emerging successor rates and operational incidents associated with changes in and the discontinuance of IBORs.

The language in our contracts and financial instruments that define IBORs, in particular LIBOR, have developed over time and may have various events that trigger when a successor rate to the designated rate would be selected. If a trigger is satisfied, contracts and financial instruments may give the calculation agent (which may be us) discretion over the successor rate or benchmark to be selected. As a result, there is considerable uncertainty as to how the financial services industry will address the discontinuance of designated rates in contracts and financial instruments or such designated rates ceasing to be acceptable reference rates. This uncertainty could ultimately result in client disputes and litigation surrounding the proper interpretation of our IBOR-based contracts and financial instruments.

Further, the discontinuation of an IBOR, changes in an IBOR or changes in market acceptance of any IBOR as a reference rate may also adversely affect the yield on loans or securities held by us, amounts paid on securities we have issued, amounts received and paid on derivative instruments we have entered into, the value of such loans, securities or derivative instruments, the trading market for securities, the terms of new loans being made using different or modified reference rates, our ability to effectively use derivative instruments to manage risk, or the availability or cost of our floating-rate funding and our exposure to fluctuations in interest rates.

***Certain of our businesses and our funding may be adversely affected by changes in other reference rates, currencies, indexes, baskets or ETFs to which products we offer or funding that we raise are linked.***

All of our floating rate funding pays interest by reference to rates, such as LIBOR or Federal Funds. In addition, many of the products that we own or that we offer, such as structured notes, warrants, swaps or security-based swaps, pay interest or determine the principal amount to be paid at maturity or in the event of default by reference to rates or by reference to an index, currency, basket, ETF or other financial metric (the underlier). In the event that the composition of the underlier is significantly changed, by reference to rules governing such underlier or otherwise, the underlier ceases to exist (for example, in the event that a country withdraws from the Euro or links its currency to or delinks its currency from another currency or benchmark, or an index or ETF sponsor materially alters the composition of an index or ETF) or the underlier ceases to be recognized as an acceptable market benchmark, we may experience adverse effects consistent with those described above for IBORs.

***Our businesses may be adversely affected if we are unable to hire and retain qualified employees.***

Our performance is largely dependent on the talents and efforts of highly skilled people; therefore, our continued ability to compete effectively in our businesses, to manage our businesses effectively and to expand into new businesses and geographic areas depends on our ability to attract new talented and diverse employees and to retain and motivate our existing employees. Factors that affect our ability to attract and retain such employees include the level and composition of our compensation and benefits, and our reputation as a successful business with a culture of fairly hiring, training and promoting qualified employees. As a significant portion of the compensation that we pay to our employees is in the form of year-end discretionary compensation, a significant portion of which is in the form of deferred equity-related awards, declines in our profitability, or in the outlook for our future profitability, as well as regulatory limitations on compensation levels and terms, can negatively impact our ability to hire and retain highly qualified employees.

Competition from within the financial services industry and from businesses outside the financial services industry, including the technology industry, for qualified employees has often been intense. Recently, we have experienced increased competition in hiring and retaining employees to address the demands of new regulatory requirements, expanding consumer-oriented businesses and our technology initiatives. This is also the case in emerging and growth markets, where we are often competing for qualified employees with entities that have a significantly greater presence or more extensive experience in the region.

Changes in law or regulation in jurisdictions in which our operations are located that affect taxes on our employees' income, or the amount or composition of compensation, may also adversely affect our ability to hire and retain qualified employees in those jurisdictions.

As described further in "Business — Regulation — Compensation Practices" in Part I, Item 1 of this Form 10-K, our compensation practices are subject to review by, and the standards of, the FRB. As a large global financial and banking institution, we are subject to limitations on compensation practices (which may or may not affect our competitors) by the FRB, the PRA, the FCA, the FDIC and other regulators worldwide. These limitations, including any imposed by or as a result of future legislation or regulation, may require us to alter our compensation practices in ways that could adversely affect our ability to attract and retain talented employees.

***We may be adversely affected by increased governmental and regulatory scrutiny or negative publicity.***

Governmental scrutiny from regulators, legislative bodies and law enforcement agencies with respect to matters relating to compensation, our business practices, our past actions and other matters has increased dramatically in the past several years. The financial crisis and the current political and public sentiment regarding financial institutions has resulted in a significant amount of adverse press coverage, as well as adverse statements or charges by regulators or other government officials. Press coverage and other public statements that assert some form of wrongdoing (including, in some cases, press coverage and public statements that do not directly involve us) often result in some type of investigation by regulators, legislators and law enforcement officials or in lawsuits.

Responding to these investigations and lawsuits, regardless of the ultimate outcome of the proceeding, is time-consuming and expensive and can divert the time and effort of our senior management from our business. Penalties and fines sought by regulatory authorities have increased substantially over the last several years, and certain regulators have been more likely in recent years to commence enforcement actions or to advance or support legislation targeted at the financial services industry. Adverse publicity, governmental scrutiny and legal and enforcement proceedings can also have a negative impact on our reputation and on the morale and performance of our employees, which could adversely affect our businesses and results of operations.

***Substantial civil or criminal liability or significant regulatory action against us could have material adverse financial effects or cause us significant reputational harm, which in turn could seriously harm our business prospects.***

We face significant legal risks in our businesses, and the volume of claims and amount of damages and penalties claimed in litigation and regulatory proceedings against financial institutions remain high. See Notes 18 and 27 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for information about certain legal and regulatory proceedings and investigations in which we are involved. Our experience has been that legal claims by customers and clients increase in a market downturn and that employment-related claims increase following periods in which we have reduced our headcount. Additionally, governmental entities have been and are plaintiffs in certain of the legal proceedings in which we are involved, and we may face future civil or criminal actions or claims by the same or other governmental entities, as well as follow-on civil litigation that is often commenced after regulatory settlements.

Significant settlements by several large financial institutions, including, in some cases, us, with governmental entities have been publicly announced. The trend of large settlements with governmental entities may adversely affect the outcomes for other financial institutions in similar actions, especially where governmental officials have announced that the large settlements will be used as the basis or a template for other settlements. The uncertain regulatory enforcement environment makes it difficult to estimate probable losses, which can lead to substantial disparities between legal reserves and subsequent actual settlements or penalties.

Recently, claims of collusion or anti-competitive conduct have become more common. Civil cases have been brought against financial institutions (including us) alleging bid rigging, group boycotts or other anti-competitive practices. Antitrust laws generally provide for joint and several liability and treble damages. These claims have in the past, and may in the future, result in significant settlements.

We are subject to laws and regulations worldwide, including the FCPA and the U.K. Bribery Act, relating to corrupt and illegal payments to, and hiring practices with regard to, government officials and others. Violation of these or similar laws and regulations could result in significant monetary penalties, severe restrictions on our activities and damage to our reputation.

Certain law enforcement authorities have recently required admissions of wrongdoing, and, in some cases, criminal pleas, as part of the resolutions of matters brought by them against financial institutions or their employees. Any such resolution of a criminal matter involving us or our employees could lead to increased exposure to civil litigation, could adversely affect our reputation, could result in penalties or limitations on our ability to conduct our activities generally or in certain circumstances and could have other negative effects.

In addition, the U.S. Department of Justice (DOJ) has announced a policy of requiring companies to provide investigators with all relevant facts relating to the individuals substantially involved in or responsible for the alleged misconduct in order to qualify for any cooperation credit in criminal investigations of corporate wrongdoing, or maximum cooperation credit in civil investigations of corporate wrongdoing. This policy may result in us incurring increased fines and penalties if the DOJ determines that we have not provided sufficient information about applicable individuals in connection with an investigation, as well as increased costs in responding to DOJ investigations. It is possible that other governmental authorities will adopt similar policies.

***The growth of electronic trading and the introduction of new trading technology may adversely affect our business and may increase competition.***

Technology is fundamental to our business and our industry. The growth of electronic trading and the introduction of new technologies is changing our businesses and presenting us with new challenges. Securities, futures and options transactions are increasingly occurring electronically, both on our own systems and through other alternative trading systems, and it appears that the trend toward alternative trading systems will continue. Some of these alternative trading systems compete with us, particularly our exchange-based market-making activities, and we may experience continued competitive pressures in these and other areas. In addition, the increased use by our clients of low-cost electronic trading systems and direct electronic access to trading markets could cause a reduction in commissions and spreads. As our clients increasingly use our systems to trade directly in the markets, we may incur liabilities as a result of their use of our order routing and execution infrastructure. We have invested significant resources into the development of electronic trading systems and expect to continue to do so, but there is no assurance that the revenues generated by these systems will yield an adequate return on our investment, particularly given the generally lower commissions arising from electronic trades.

***Our commodities activities, particularly our physical commodities activities, subject us to extensive regulation and involve certain potential risks, including environmental, reputational and other risks that may expose us to significant liabilities and costs.***

As part of our commodities business, we purchase and sell certain physical commodities, arrange for their storage and transport, and engage in market making of commodities. The commodities involved in these activities may include crude oil, refined oil products, natural gas, liquefied natural gas, electric power, agricultural products, metals (base and precious), minerals (including unenriched uranium), emission credits, coal, freight and related products and indices.

In our investing and lending businesses, we make investments in and finance entities that engage in the production, storage and transportation of numerous commodities, including many of the commodities referenced above.

These activities subject us and/or the entities in which we invest to extensive and evolving federal, state and local energy, environmental, antitrust and other governmental laws and regulations worldwide, including environmental laws and regulations relating to, among others, air quality, water quality, waste management, transportation of hazardous substances, natural resources, site remediation and health and safety. Additionally, rising climate change concerns may lead to additional regulation that could increase the operating costs and adversely affect the profitability of certain of our investments.

There may be substantial costs in complying with current or future laws and regulations relating to our commodities-related activities and investments. Compliance with these laws and regulations could require significant commitments of capital toward environmental monitoring, renovation of storage facilities or transport vessels, payment of emission fees and carbon or other taxes, and application for, and holding of, permits and licenses.

Commodities involved in our intermediation activities and investments are also subject to the risk of unforeseen or catastrophic events, which are likely to be outside of our control, including those arising from the breakdown or failure of transport vessels, storage facilities or other equipment or processes or other mechanical malfunctions, fires, leaks, spills or release of hazardous substances, performance below expected levels of output or efficiency, terrorist attacks, extreme weather events or other natural disasters or other hostile or catastrophic events. In addition, we rely on third-party suppliers or service providers to perform their contractual obligations and any failure on their part, including the failure to obtain raw materials at reasonable prices or to safely transport or store commodities, could expose us to costs or losses. Also, while we seek to insure against potential risks, we may not be able to obtain insurance to cover some of these risks and the insurance that we have may be inadequate to cover our losses.

The occurrence of any of such events may prevent us from performing under our agreements with clients, may impair our operations or financial results and may result in litigation, regulatory action, negative publicity or other reputational harm.

We may also be required to divest or discontinue certain of these activities for regulatory or legal reasons. For example, the FRB has proposed regulations that could impose significant additional capital requirements on certain commodity-related activities. If that occurs, we may receive a value that is less than the then carrying value, as we may be unable to exit these activities in an orderly transaction.

***In conducting our businesses around the world, we are subject to political, economic, legal, operational and other risks that are inherent in operating in many countries.***

In conducting our businesses and maintaining and supporting our global operations, we are subject to risks of possible nationalization, expropriation, price controls, capital controls, exchange controls and other restrictive governmental actions, as well as the outbreak of hostilities or acts of terrorism. For example, sanctions have been imposed by the U.S. and the E.U. on certain individuals and companies in Russia. In many countries, the laws and regulations applicable to the securities and financial services industries and many of the transactions in which we are involved are uncertain and evolving, and it may be difficult for us to determine the exact requirements of local laws in every market. Any determination by local regulators that we have not acted in compliance with the application of local laws in a particular market or our failure to develop effective working relationships with local regulators could have a significant and negative effect not only on our businesses in that market, but also on our reputation generally. Further, in some jurisdictions a failure to comply with laws and regulations may subject us and our personnel not only to civil actions, but also criminal actions. We are also subject to the enhanced risk that transactions we structure might not be legally enforceable in all cases.

Our businesses and operations are increasingly expanding throughout the world, including in emerging and growth markets, and we expect this trend to continue. Various emerging and growth market countries have experienced severe economic and financial disruptions, including significant devaluations of their currencies, defaults or threatened defaults on sovereign debt, capital and currency exchange controls, and low or negative growth rates in their economies, as well as military activity, civil unrest or acts of terrorism. The possible effects of any of these conditions include an adverse impact on our businesses and increased volatility in financial markets generally.

While business and other practices throughout the world differ, our principal entities are subject in their operations worldwide to rules and regulations relating to corrupt and illegal payments, hiring practices and money laundering, as well as laws relating to doing business with certain individuals, groups and countries, such as the FCPA, the USA PATRIOT Act and the U.K. Bribery Act. While we have invested and continue to invest significant resources in training and in compliance monitoring, the geographical diversity of our operations, employees, clients and customers, as well as the vendors and other third parties that we deal with, greatly increases the risk that we may be found in violation of such rules or regulations and any such violation could subject us to significant penalties or adversely affect our reputation.

In addition, there have been a number of highly publicized cases around the world, involving actual or alleged fraud or other misconduct by employees in the financial services industry in recent years, and we run the risk that employee misconduct could occur. This misconduct may include intentional efforts to ignore or circumvent applicable policies, rules or procedures. This misconduct has included and may also include in the future the theft of proprietary information, including proprietary software. It is not always possible to deter or prevent employee misconduct and the precautions we take to prevent and detect this activity have not been and may not be effective in all cases. See for example, "1Malaysia Development Berhad (1MDB)-Related Matters" in Note 27 to the consolidated financial statements in Part II, Item 8 of this Form 10-K.

***We may incur losses as a result of unforeseen or catastrophic events, including the emergence of a pandemic, terrorist attacks, extreme weather events or other natural disasters.***

The occurrence of unforeseen or catastrophic events, including the emergence of a pandemic, such as the Ebola or Zika viruses, or other widespread health emergency (or concerns over the possibility of such an emergency), terrorist attacks, extreme terrestrial or solar weather events or other natural disasters, could create economic and financial disruptions, and could lead to operational difficulties (including travel limitations) that could impair our ability to manage our businesses.

## Item 1B. Unresolved Staff Comments

There are no material unresolved written comments that were received from the SEC staff 180 days or more before the end of our fiscal year relating to our periodic or current reports under the Exchange Act.

## Item 2. Properties

Our principal executive offices are located at 200 West Street, New York, New York and consist of approximately 2.1 million square feet. The building is located on a parcel leased from Battery Park City Authority pursuant to a ground lease. Under the lease, Battery Park City Authority holds title to all improvements, including the office building, subject to Goldman Sachs' right of exclusive possession and use until June 2069, the expiration date of the lease. Under the terms of the ground lease, we made a lump sum ground rent payment in June 2007 of $161 million for rent through the term of the lease. We have offices at 30 Hudson Street in Jersey City, New Jersey, which we own and which include approximately 1.6 million square feet of office space. We have additional offices and commercial space in the U.S. and elsewhere in the Americas, which together consist of approximately 2.6 million square feet of leased and owned space.

In Europe, the Middle East and Africa, we have offices that total approximately 1.6 million square feet of leased and owned space. Our European headquarters is located in London at Peterborough Court, pursuant to a lease that we can terminate in 2019. In total, we have offices with approximately 1.2 million square feet in London, relating to various properties. We have substantially completed the construction of a 826,000 square foot office in London. We entered into a sale and leaseback agreement for the property, which closed in January 2019. We expect initial occupancy during 2019.

In Asia, Australia and New Zealand, we have offices with approximately 3.1 million square feet. Our headquarters in this region are in Tokyo, at the Roppongi Hills Mori Tower, and in Hong Kong, at the Cheung Kong Center. In Japan, we currently have offices with approximately 219,000 square feet, the majority of which have leases that will expire in 2023. In Hong Kong, we currently have offices with approximately 300,000 square feet, the majority of which will expire in 2026.

In the preceding paragraphs, square footage figures are provided only for properties that are used in the operation of our businesses.

Our occupancy expenses include costs for office space held in excess of our current requirements. This excess space, the cost of which is charged to earnings as incurred, is being held for potential growth or to replace currently occupied space that we may exit in the future. We regularly evaluate our space capacity in relation to current and projected headcount levels. We may incur exit costs in the future if we (i) reduce our space capacity or (ii) commit to, or occupy, new properties in locations in which we operate and dispose of existing space that had been held for potential growth. These costs may be material to our operating results in a given period.

## Item 3. Legal Proceedings

We are involved in a number of judicial, regulatory and arbitration proceedings concerning matters arising in connection with the conduct of our businesses. Many of these proceedings are in early stages, and many of these cases seek an indeterminate amount of damages. However, we believe, based on currently available information, that the results of such proceedings, in the aggregate, will not have a material adverse effect on our financial condition, but may be material to our operating results in a given period. Given the range of litigation and investigations presently under way, our litigation expenses can be expected to remain high. See "Management's Discussion and Analysis of Financial Condition and Results of Operations — Use of Estimates" in Part II, Item 7 of this Form 10-K. See Notes 18 and 27 to the consolidated financial statements in Part II, Item 8 of this Form 10-K for information about certain judicial, regulatory and legal proceedings.

## Item 4. Mine Safety Disclosures

Not applicable.

# PART II

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

The principal market on which our common stock is traded is the NYSE under the symbol "GS." Information relating to the performance of our common stock from December 31, 2013 through December 31, 2018 is set forth in "Supplemental Financial Information — Common Stock Performance" in Part II, Item 8 of this Form 10-K. As of February 8, 2019, there were 7,137 holders of record of our common stock.

The declaration of dividends by Group Inc. is subject to the discretion of the Board of Directors of Group Inc. (Board). Our Board will take into account such matters as general business conditions, our financial results, capital requirements, contractual, legal and regulatory restrictions on the payment of dividends by us to our shareholders or by our subsidiaries to us, the effect on our debt ratings and such other factors as our Board may deem relevant. The holders of our common stock share proportionately on a per share basis in all dividends and other distributions on common stock declared by our Board.

The table below presents purchases made by or on behalf of Group Inc. or any "affiliated purchaser" (as defined in Rule 10b-18(a)(3) under the Exchange Act) of our common stock during the fourth quarter of 2018.

| | Total Shares Purchased | Average Price Paid Per Share | Total Shares Purchased as Part of a Publicly Announced Program | Maximum Shares That May Yet Be Purchased Under the Program |
|---|---|---|---|---|
| **2018** | | | | |
| October | **3,440,242** | **$219.52** | **3,440,242** | **35,862,341** |
| November | **2,182,707** | **$226.69** | **2,182,707** | **33,679,634** |
| December | **100** | **$178.34** | **100** | **33,679,534** |
| **Total** | **5,623,049** | | **5,623,049** | |

Since March 2000, our Board has approved a repurchase program authorizing repurchases of up to 555 million shares of our common stock. The repurchase program is effected primarily through regular open-market purchases (which may include repurchase plans designed to comply with Rule 10b5-1), the amounts and timing of which are determined primarily by our current and projected capital position, but which may also be influenced by general market conditions and the prevailing price and trading volumes of our common stock. The repurchase program has no set expiration or termination date. Prior to repurchasing common stock, we must receive confirmation that the FRB does not object to such capital action.

Information relating to compensation plans under which our equity securities are authorized for issuance is presented in Part III, Item 12 of this Form 10-K.

## Item 6. Selected Financial Data

The Selected Financial Data table is set forth in Part II, Item 8 of this Form 10-K.

# Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

## Introduction

The Goldman Sachs Group, Inc. (Group Inc. or parent company), a Delaware corporation, together with its consolidated subsidiaries, is a leading global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals. Founded in 1869, we are headquartered in New York and maintain offices in all major financial centers around the world.

When we use the terms "we," "us" and "our," we mean Group Inc. and its consolidated subsidiaries. We report our activities in four business segments: Investment Banking, Institutional Client Services, Investing & Lending and Investment Management. See "Results of Operations" for further information about our business segments.

References to "this Form 10-K" are to our Annual Report on Form 10-K for the year ended December 31, 2018. All references to "the consolidated financial statements" or "Supplemental Financial Information" are to Part II, Item 8 of this Form 10-K. All references to 2018, 2017 and 2016 refer to our years ended, or the dates, as the context requires, December 31, 2018, December 31, 2017 and December 31, 2016, respectively. Any reference to a future year refers to a year ending on December 31 of that year. Certain reclassifications have been made to previously reported amounts to conform to the current presentation.

In this discussion and analysis of our financial condition and results of operations, we have included information that may constitute "forward-looking statements" within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are not historical facts, but instead represent only our beliefs regarding future events, many of which, by their nature, are inherently uncertain and outside our control.

These statements include statements other than historical information or statements of current conditions and may relate to our future plans and objectives and results, among other things, and may also include statements about the effect of changes to the capital, leverage, liquidity, long-term debt and total loss-absorbing capacity (TLAC) rules applicable to banks and bank holding companies (BHCs), the impact of the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) on our businesses and operations, and various legal proceedings, governmental investigations or mortgage-related contingencies as set forth in both Notes 27 and 18 to the consolidated financial statements in Part II, Item 8 of this Form 10-K, as well as statements about the results of our Dodd-Frank Act and our stress tests, statements about the objectives and effectiveness of our business continuity plan, information security program, risk management and liquidity policies, statements about our resolution plan and resolution strategy and their implications for our debtholders and other stakeholders, statements about the design and effectiveness of our resolution capital and liquidity models and our triggers and alerts framework, statements about trends in or growth opportunities for our businesses, statements about our future status, activities or reporting under U.S. or non-U.S. banking and financial regulation, statements about our investment banking transaction backlog, statements about our expected tax rate, statements about the estimated impact of new accounting standards, statements about the level of capital actions, statements about our expected interest income, statements about our credit exposures, statements about our preparations following the U.K.'s notification to the European Council of its decision to leave the E.U. (Brexit), including our plan to manage a hard Brexit scenario, statements about the replacement of LIBOR and other IBORs and the objectives of our program related to the transition from IBORs to alternative risk-free reference rates, and statements about the adequacy of our allowance for credit losses.

By identifying these statements for you in this manner, we are alerting you to the possibility that our actual results and financial condition may differ, possibly materially, from the anticipated results and financial condition indicated in these forward-looking statements. Important factors that could cause our actual results and financial condition to differ from those indicated in these forward-looking statements include, among others, those described in "Risk Factors" in Part I, Item 1A of this Form 10-K and "Cautionary Statement Pursuant to the U.S. Private Securities Litigation Reform Act of 1995" in Part I, Item 1 of this Form 10-K.

## Executive Overview

**2018 versus 2017.** We generated net earnings of $10.46 billion for 2018, significantly higher compared with $4.29 billion for 2017. Diluted earnings per common share was $25.27 for 2018, significantly higher compared with $9.01 for 2017. Return on average common shareholders' equity (ROE) was 13.3% for 2018, compared with 4.9% for 2017. Book value per common share was $207.36 as of December 2018, 14.6% higher compared with December 2017.

In 2018, we recorded a $487 million income tax benefit as we finalized the estimated income tax expense of $4.40 billion related to the Tax Cuts and Jobs Act (Tax Legislation) recorded in the fourth quarter of 2017. Excluding these items, diluted earnings per common share was $24.02 for 2018, compared with $19.76 for 2017, and ROE was 12.7% for 2018, compared with 10.8% for 2017. See "Results of Operations — Financial Overview" for further information about non-GAAP measures that exclude the impact of Tax Legislation. See "Results of Operations — Provision for Taxes" for further information about Tax Legislation.

Net revenues were $36.62 billion for 2018, 12% higher than 2017, reflecting higher net revenues across all segments. Net revenues in Institutional Client Services were higher, due to higher net revenues in both Equities and Fixed Income, Currency and Commodities Client Execution (FICC Client Execution). Net revenues in Investing & Lending increased, driven by significantly higher net interest income in debt securities and loans. Net revenues were also higher in Investment Management, primarily due to significantly higher incentive fees, and Investment Banking, reflecting strong net revenues in both Financial Advisory and Underwriting during 2018.

Provision for credit losses was $674 million for 2018, compared with $657 million for 2017, as the higher provision for credit losses primarily related to consumer loan growth in 2018 was partially offset by an impairment of approximately $130 million on a secured loan in 2017.

Operating expenses were $23.46 billion for 2018, 12% higher than 2017, primarily due to higher compensation and benefits expenses, reflecting improved operating performance, and significantly higher net provisions for litigation and regulatory proceedings.

We returned $4.52 billion of capital to common shareholders during 2018, including $3.29 billion of common share repurchases and $1.23 billion in common stock dividends. As of December 2018, our Common Equity Tier 1 (CET1) ratio as calculated in accordance with the Standardized approach was 13.3% and the Basel III Advanced approach was 13.1%. See Note 20 to the consolidated financial statements for further information about our capital ratios.

**2017 versus 2016.** We generated net earnings of $4.29 billion for 2017, a decrease of 42%, compared with $7.40 billion in 2016. Diluted earnings per common share was $9.01 for 2017, a decrease of 45%, compared with $16.29 for 2016. ROE was 4.9% for 2017, compared with 9.4% for 2016. Book value per common share was $181.00 as of December 2017, 0.8% lower compared with December 2016.

Net revenues were $32.73 billion for 2017, 6% higher than 2016, due to significantly higher net revenues in Investing & Lending and higher net revenues in both Investment Banking and Investment Management. These increases were partially offset by lower net revenues in Institutional Client Services, primarily reflecting significantly lower net revenues in FICC Client Execution.

Provision for credit losses was $657 million for 2017, compared with $182 million for 2016, reflecting an increase in impairments, which included an impairment of approximately $130 million on a secured loan in 2017, and higher provision for credit losses primarily related to consumer loan growth.

Operating expenses were $20.94 billion for 2017, 3% higher than 2016, primarily driven by slightly higher compensation and benefits expenses and our investments to fund growth.

We returned $7.90 billion of capital to common shareholders during 2017, including $6.72 billion of common share repurchases and $1.18 billion in common stock dividends. As of December 2017, our CET1 ratio as calculated in accordance with the Standardized approach was 12.1% and the Basel III Advanced approach was 10.9%, in each case reflecting the applicable transitional provisions. See Note 20 to the consolidated financial statements for further information about our capital ratios.

## Business Environment

### Global

During 2018, real gross domestic product (GDP) growth appeared to increase in the U.S. but generally decreased in other major economies. In advanced economies, growth in the Euro area, U.K., and Japan each was lower and, in emerging markets, growth in China decreased slightly. Economic activity in several major emerging market economies was impacted by concerns about the vulnerability of these economies to a stronger U.S. dollar and higher U.S. Treasury rates. Global asset markets experienced significant periods of volatility in the first and fourth quarters of 2018 driven by concerns about the prospect of slowing global growth and tighter monetary policy. The U.S. presidential administration implemented and proposed new tariffs on imports from China, which prompted retaliatory measures, and rising global trade tensions remained a meaningful source of uncertainty affecting asset prices throughout 2018. Political uncertainty in Europe increased as a new coalition government formed in Italy in May 2018 and the future of the relationship between the U.K. and E.U. remained uncertain. During 2018, the U.S. Federal Reserve increased the target federal funds rate four times and the Bank of England increased its official target interest rate in August 2018, while the Bank of Japan introduced forward guidance and expanded the permissible range of fluctuations for the 10-year interest rate.

In investment banking, industry-wide announced and completed mergers and acquisitions volumes increased compared with 2017, while industry-wide underwriting transactions decreased.

### United States

In the U.S., real GDP appeared to increase by 2.9% in 2018, compared with 2.2% in 2017, as growth in total fixed investment and government spending increased. Measures of consumer confidence were stronger on average compared with the prior year, and the unemployment rate declined to 3.9% as of December 2018. Housing starts, sales and prices increased compared with 2017. Measures of headline inflation were stable compared with 2017, while measures of core inflation (excluding food and energy) increased. The U.S. Federal Reserve increased the target federal funds rate by 25 basis points in each quarter of 2018 to a range of 2.25% to 2.50% as of December 2018. The yield on the 10-year U.S. Treasury note ended the year at 2.69%, 29 basis points higher compared with the end of 2017. The price of crude oil (WTI) ended the year at approximately $45 per barrel, a decrease of 25% compared with the end of 2017. In equity markets, the Dow Jones Industrial Average decreased by 6%, the S&P 500 Index decreased by 6% and the NASDAQ Composite Index decreased by 4% compared with the end of 2017.

### Europe

In the Euro area, real GDP increased by 1.8% in 2018, compared with 2.4% in 2017, while measures of inflation remained low. The European Central Bank maintained its main refinancing operations rate at 0% and its deposit rate at (0.40)%, but reduced its monthly asset purchases to a pace of €15 billion per month after September 2018 and through December 2018, after which net asset purchases ended. Measures of unemployment decreased, and the Euro depreciated by 4% against the U.S. dollar compared with the end of 2017. Following the formation of a new coalition government in May 2018, political uncertainty in Italy remained high and the yield on 10-year government bonds in Italy increased significantly. Elsewhere in the Euro area, yields on 10-year government bonds mostly decreased. In equity markets, the DAX Index decreased by 18%, the Euro Stoxx 50 Index decreased by 14% and the CAC 40 Index decreased by 11% compared with the end of 2017. In March 2018, it was announced that terms were agreed upon for the transitional period of the U.K.'s withdrawal from the E.U. and, in November 2018, the U.K. and the E.U. agreed on a draft Brexit withdrawal agreement. However, as of the end of the year, there was significant uncertainty about the future relationship between the U.K. and the E.U.

In the U.K., real GDP increased by 1.4% in 2018, compared with 1.8% in 2017. The Bank of England increased its official bank rate by 25 basis points to 0.75% in August 2018, and the British pound depreciated by 6% against the U.S. dollar. The yield on 10-year government bonds increased by 8 basis points and, in equity markets, the FTSE 100 Index decreased by 12% compared with the end of 2017.

### Asia

In Japan, real GDP increased by 0.7% in 2018, compared with 1.9% in 2017. The Bank of Japan maintained its asset purchase program and continued to target a yield on 10-year government bonds of approximately 0%. In July 2018, the Bank of Japan introduced forward guidance for its interest rate policy and expanded the permissible range of deviations from the 0% target yield for the 10-year government bond. The yield on 10-year government bonds decreased by 3 basis points, the U.S. dollar depreciated by 3% against the Japanese yen and the Nikkei 225 Index decreased by 12% compared with the end of 2017.

In China, real GDP increased by 6.6% in 2018, compared with 6.8% in 2017. The U.S. dollar appreciated by 6% against the Chinese yuan compared with the end of 2017, while in equity markets, the Shanghai Composite Index decreased by 25% and the Hang Seng Index decreased by 14%.

In India, real GDP appeared to increase by 7.5% in 2018, compared with 6.3% in 2017. The U.S. dollar appreciated by 9% against the Indian rupee and the BSE Sensex Index increased by 6% compared with the end of 2017.

### Other Markets

In Brazil, real GDP appeared to increase by 1.2% in 2018, compared with 1.1% in 2017. The U.S. dollar appreciated by 17% against the Brazilian real and the Bovespa Index increased by 15% compared with the end of 2017. In Russia, real GDP appeared to increase by 2.3% in 2018, compared with 1.5% in 2017. The U.S. dollar appreciated by 21% against the Russian ruble and the MOEX Russia Index increased by 12% compared with the end of 2017.

## Critical Accounting Policies

### Fair Value

**Fair Value Hierarchy.** Financial instruments owned and financial instruments sold, but not yet purchased (i.e., inventory), and certain other financial assets and financial liabilities, are included in our consolidated statements of financial condition at fair value (i.e., marked-to-market), with related gains or losses generally recognized in our consolidated statements of earnings. The use of fair value to measure financial instruments is fundamental to our risk management practices and is our most critical accounting policy.

The fair value of a financial instrument is the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. We measure certain financial assets and financial liabilities as a portfolio (i.e., based on its net exposure to market and/or credit risks). In determining fair value, the hierarchy under U.S. generally accepted accounting principles (U.S. GAAP) gives (i) the highest priority to unadjusted quoted prices in active markets for identical, unrestricted assets or liabilities (level 1 inputs), (ii) the next priority to inputs other than level 1 inputs that are observable, either directly or indirectly (level 2 inputs), and (iii) the lowest priority to inputs that cannot be observed in market activity (level 3 inputs). In evaluating the significance of a valuation input, we consider, among other factors, a portfolio's net risk exposure to that input. Assets and liabilities are classified in their entirety based on the lowest level of input that is significant to their fair value measurement.

The fair values for substantially all of our financial assets and financial liabilities are based on observable prices and inputs and are classified in levels 1 and 2 of the fair value hierarchy. Certain level 2 and level 3 financial assets and financial liabilities may require appropriate valuation adjustments that a market participant would require to arrive at fair value for factors such as counterparty and our credit quality, funding risk, transfer restrictions, liquidity and bid/offer spreads.

Instruments classified in level 3 of the fair value hierarchy are those which require one or more significant inputs that are not observable. Level 3 financial assets represented 2.4% as of December 2018 and 2.1% as of December 2017, of our total assets. See Notes 5 through 8 to the consolidated financial statements for further information about level 3 financial assets, including changes in level 3 financial assets and related fair value measurements. Absent evidence to the contrary, instruments classified in level 3 of the fair value hierarchy are initially valued at transaction price, which is considered to be the best initial estimate of fair value. Subsequent to the transaction date, we use other methodologies to determine fair value, which vary based on the type of instrument. Estimating the fair value of level 3 financial instruments requires judgments to be made. These judgments include:

- Determining the appropriate valuation methodology and/ or model for each type of level 3 financial instrument;
- Determining model inputs based on an evaluation of all relevant empirical market data, including prices evidenced by market transactions, interest rates, credit spreads, volatilities and correlations; and
- Determining appropriate valuation adjustments, including those related to illiquidity or counterparty credit quality.

Regardless of the methodology, valuation inputs and assumptions are only changed when corroborated by substantive evidence.

**Controls Over Valuation of Financial Instruments.** Market makers and investment professionals in our revenue-producing units are responsible for pricing our financial instruments. Our control infrastructure is independent of the revenue-producing units and is fundamental to ensuring that all of our financial instruments are appropriately valued at market-clearing levels. In the event that there is a difference of opinion in situations where estimating the fair value of financial instruments requires judgment (e.g., calibration to market comparables or trade comparison, as described below), the final valuation decision is made by senior managers in independent risk oversight and control functions. This independent price verification is critical to ensuring that our financial instruments are properly valued.

**Price Verification.** All financial instruments at fair value classified in levels 1, 2 and 3 of the fair value hierarchy are subject to our independent price verification process. The objective of price verification is to have an informed and independent opinion with regard to the valuation of financial instruments under review. Instruments that have one or more significant inputs which cannot be corroborated by external market data are classified in level 3 of the fair value hierarchy. Price verification strategies utilized by our independent risk oversight and control functions include:

- **Trade Comparison.** Analysis of trade data (both internal and external, where available) is used to determine the most relevant pricing inputs and valuations.
- **External Price Comparison.** Valuations and prices are compared to pricing data obtained from third parties (e.g., brokers or dealers, Markit, Bloomberg, IDC, TRACE). Data obtained from various sources is compared to ensure consistency and validity. When broker or dealer quotations or third-party pricing vendors are used for valuation or price verification, greater priority is generally given to executable quotations.
- **Calibration to Market Comparables.** Market-based transactions are used to corroborate the valuation of positions with similar characteristics, risks and components.
- **Relative Value Analyses.** Market-based transactions are analyzed to determine the similarity, measured in terms of risk, liquidity and return, of one instrument relative to another or, for a given instrument, of one maturity relative to another.
- **Collateral Analyses.** Margin calls on derivatives are analyzed to determine implied values, which are used to corroborate our valuations.
- **Execution of Trades.** Where appropriate, trading desks are instructed to execute trades in order to provide evidence of market-clearing levels.
- **Backtesting.** Valuations are corroborated by comparison to values realized upon sales.

See Notes 5 through 8 to the consolidated financial statements for further information about fair value measurements.

**Review of Net Revenues.** Independent risk oversight and control functions ensure adherence to our pricing policy through a combination of daily procedures, including the explanation and attribution of net revenues based on the underlying factors. Through this process, we independently validate net revenues, identify and resolve potential fair value or trade booking issues on a timely basis and seek to ensure that risks are being properly categorized and quantified.

**Review of Valuation Models.** Our independent model risk management group (Model Risk Management), consisting of quantitative professionals who are separate from model developers, performs an independent model review and validation process of our valuation models. New or changed models are reviewed and approved prior to being put into use. Models are evaluated and re-approved annually to assess the impact of any changes in the product or market and any market developments in pricing theories. See "Risk Management — Model Risk Management" for further information about the review and validation of our valuation models.

### Goodwill and Identifiable Intangible Assets

**Goodwill.** Goodwill is the cost of acquired companies in excess of the fair value of net assets, including identifiable intangible assets, at the acquisition date.

Goodwill is assessed for impairment annually in the fourth quarter or more frequently if events occur or circumstances change that indicate an impairment may exist. When assessing goodwill for impairment, first, qualitative factors are assessed to determine whether it is more likely than not that the estimated fair value of a reporting unit is less than its estimated carrying value. If the results of the qualitative assessment are not conclusive, a quantitative goodwill test is performed by comparing the estimated fair value of each reporting unit with its estimated carrying value.

In the fourth quarter of 2018, we assessed goodwill for impairment for each of our reporting units by performing a qualitative assessment. The qualitative assessment required management to make judgments and to evaluate several factors, which included, but were not limited to, performance indicators, firm and industry events, macroeconomic indicators and fair value indicators. Based on our evaluation of these factors, we determined that it was more likely than not that the estimated fair value of each of the reporting units exceeded its respective estimated carrying value. Therefore, we determined that goodwill for each reporting unit was not impaired and that a quantitative goodwill test was not required.

See Note 13 to the consolidated financial statements for further information about our goodwill.

Estimating the fair value of our reporting units requires management to make judgments. Critical inputs to the fair value estimates include projected earnings and attributed equity. There is inherent uncertainty in the projected earnings. The estimated net book value of each reporting unit reflects an allocation of total shareholders' equity and represents the estimated amount of total shareholders' equity required to support the activities of the reporting unit under currently applicable regulatory capital requirements. See "Equity Capital Management and Regulatory Capital" for further information about our capital requirements.

If we experience a prolonged or severe period of weakness in the business environment, financial markets, our performance or our common stock price, or additional increases in capital requirements, our goodwill could be impaired in the future.

**Identifiable Intangible Assets.** We amortize our identifiable intangible assets over their estimated useful lives generally using the straight-line method. Identifiable intangible assets are tested for impairment whenever events or changes in circumstances suggest that an asset's or asset group's carrying value may not be fully recoverable.

A prolonged or severe period of market weakness, or significant changes in regulation, could adversely impact our businesses and impair the value of our identifiable intangible assets. In addition, certain events could indicate a potential impairment of our identifiable intangible assets, including weaker business performance resulting in a decrease in our customer base and decreases in revenues from customer contracts and relationships. Management judgment is required to evaluate whether indications of potential impairment have occurred, and to test intangible assets for impairment, if required.

An impairment, generally calculated as the difference between the estimated fair value and the carrying value of an asset or asset group, is recognized if the total of the estimated undiscounted cash flows relating to the asset or asset group is less than the corresponding carrying value.

See Note 13 to the consolidated financial statements for further information about our identifiable intangible assets.

## Recent Accounting Developments

See Note 3 to the consolidated financial statements for information about Recent Accounting Developments.

## Use of Estimates

U.S. GAAP requires management to make certain estimates and assumptions. In addition to the estimates we make in connection with fair value measurements and the accounting for goodwill and identifiable intangible assets, the use of estimates and assumptions is also important in determining the allowance for credit losses on loans receivable and lending commitments held for investment, provisions for losses that may arise from litigation and regulatory proceedings (including governmental investigations), and provisions for losses that may arise from tax audits.

We estimate and record an allowance for credit losses related to our loans receivable and lending commitments held for investment. Management's estimate of credit losses entails judgment about collectability at the reporting dates, and there are uncertainties inherent in those judgments. See Note 9 to the consolidated financial statements for further information about the allowance for credit losses.

We also estimate and provide for potential losses that may arise out of litigation and regulatory proceedings to the extent that such losses are probable and can be reasonably estimated. In addition, we estimate the upper end of the range of reasonably possible aggregate loss in excess of the related reserves for litigation and regulatory proceedings where we believe the risk of loss is more than slight. See Notes 18 and 27 to the consolidated financial statements for information about certain judicial, litigation and regulatory proceedings.

Significant judgment is required in making these estimates and our final liabilities may ultimately be materially different. Our total estimated liability in respect of litigation and regulatory proceedings is determined on a case-by-case basis and represents an estimate of probable losses after considering, among other factors, the progress of each case, proceeding or investigation, our experience and the experience of others in similar cases, proceedings or investigations, and the opinions and views of legal counsel.

In accounting for income taxes, we recognize tax positions in the financial statements only when it is more likely than not that the position will be sustained on examination by the relevant taxing authority based on the technical merits of the position. See Note 24 to the consolidated financial statements for further information about income taxes.

## Results of Operations

The composition of our net revenues has varied over time as financial markets and the scope of our operations have changed. The composition of net revenues can also vary over the shorter term due to fluctuations in U.S. and global economic and market conditions. See "Risk Factors" in Part I, Item 1A of this Form 10-K for further information about the impact of economic and market conditions on our results of operations.

### Financial Overview

The table below presents an overview of financial results and selected financial ratios.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions, except per share amounts* | **2018** | 2017 | 2016 |
| Net revenues | **$36,616** | $32,730 | $30,790 |
| Pre-tax earnings | **$12,481** | $11,132 | $10,304 |
| Net earnings | **$10,459** | $ 4,286 | $ 7,398 |
| Net earnings applicable to common shareholders | **$ 9,860** | $ 3,685 | $ 7,087 |
| Diluted earnings per common share | **$ 25.27** | $ 9.01 | $ 16.29 |
| ROE | **13.3%** | 4.9% | 9.4% |
| ROTE | **14.1%** | 5.2% | 9.9% |
| Net earnings to average total assets | **1.1%** | 0.5% | 0.8% |
| Return on average total shareholders' equity | **12.3%** | 5.0% | 8.5% |
| Average total shareholders' equity to average total assets | **8.8%** | 9.5% | 9.8% |
| Dividend payout ratio | **12.5%** | 32.2% | 16.0% |

In the table above:

- Dividend payout ratio is calculated by dividing dividends declared per common share by diluted earnings per common share.
- Net earnings applicable to common shareholders for 2016 included a benefit of $266 million, reflected in preferred stock dividends, related to the exchange of APEX for shares of Series E and Series F Preferred Stock. See Note 19 to the consolidated financial statements for further information.
- ROE is calculated by dividing net earnings applicable to common shareholders by average monthly common shareholders' equity. Tangible common shareholders' equity is calculated as total shareholders' equity less preferred stock, goodwill and identifiable intangible assets. Return on average tangible common shareholders' equity (ROTE) is calculated by dividing net earnings applicable to common shareholders by average monthly tangible common shareholders' equity. We believe that tangible common shareholders' equity is meaningful because it is a measure that we and investors use to assess capital adequacy and that ROTE is meaningful because it measures the performance of businesses consistently, whether they were acquired or developed internally. Tangible common shareholders' equity and ROTE are non-GAAP measures and may not be comparable to similar non-GAAP measures used by other companies. Return on average total shareholders' equity is calculated by dividing net earnings by average monthly total shareholders' equity. The table below presents average common and total shareholders' equity, including the reconciliation of average total shareholders' equity to average tangible common shareholders' equity.

| | Average for the Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Total shareholders' equity | **$ 85,238** | $ 85,959 | $ 86,658 |
| Preferred stock | **(11,253)** | (11,238) | (11,304) |
| **Common shareholders' equity** | **73,985** | 74,721 | 75,354 |
| Goodwill and identifiable intangible assets | **(4,090)** | (4,065) | (4,126) |
| **Tangible common shareholders' equity** | **$ 69,895** | $ 70,656 | $ 71,228 |

- In 2017, we recorded $4.40 billion of estimated income tax expense related to Tax Legislation. Excluding this expense, diluted earnings per common share was $19.76, ROE was 10.8% and ROTE was 11.4% for 2017. In the fourth quarter of 2018, we finalized this estimate to reflect the impact of updated information, including subsequent guidance issued by the U.S. Internal Revenue Service (IRS), resulting in a $487 million income tax benefit for 2018. Excluding this benefit, diluted earnings per common share was $24.02, ROE was 12.7% and ROTE was 13.4% for 2018. We believe that presenting our results excluding Tax Legislation is meaningful as excluding the above items increases the comparability of period-to-period results. See "Results of Operations — Provision for Taxes" for further information about Tax Legislation. Diluted earnings per common share, ROE and ROTE, excluding the impact of the above items related to Tax Legislation, are non-GAAP measures and may not be comparable to similar non-GAAP measures used by other companies. The tables below present the calculation of net earnings applicable to common shareholders, diluted earnings per common share and average common shareholders' equity, excluding the impact of the above items related to Tax Legislation.

| | Year Ended December | |
|---|---|---|
| *in millions, except per share amounts* | **2018** | 2017 |
| Net earnings applicable to common shareholders, as reported | **$9,860** | $3,685 |
| Impact of Tax Legislation | **(487)** | 4,400 |
| Net earnings applicable to common shareholders, excluding the impact of Tax Legislation | **$9,373** | $8,085 |
| Divided by average diluted common shares | **390.2** | 409.1 |
| **Diluted earnings per common share, excluding the impact of Tax Legislation** | **$24.02** | $19.76 |

| | Average for the Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Common shareholders' equity, as reported | **$73,985** | $74,721 |
| Impact of Tax Legislation | **(42)** | 338 |
| **Common shareholders' equity, excluding the impact of Tax Legislation** | **73,943** | 75,059 |
| Goodwill and identifiable intangible assets | **(4,090)** | (4,065) |
| **Tangible common shareholders' equity, excluding the impact of Tax Legislation** | **$69,853** | $70,994 |

- In 2017, as required, we adopted ASU No. 2016-09, "Compensation — Stock Compensation (Topic 718) — Improvements to Employee Share-Based Payment Accounting." The impact of adoption was a reduction to our provision for taxes of $719 million for 2017, which increased diluted earnings per common share by approximately $1.75 and both ROE and ROTE by approximately 1.0 percentage points. The impact for 2018 was not material. See Note 3 to the consolidated financial statements for further information about this ASU.

## Net Revenues

The table below presents net revenues by line item.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Investment banking | **$ 7,862** | $ 7,371 | $ 6,273 |
| Investment management | **6,514** | 5,803 | 5,407 |
| Commissions and fees | **3,199** | 3,051 | 3,208 |
| Market making | **9,451** | 7,660 | 9,933 |
| Other principal transactions | **5,823** | 5,913 | 3,382 |
| Total non-interest revenues | **32,849** | 29,798 | 28,203 |
| Interest income | **19,679** | 13,113 | 9,691 |
| Interest expense | **15,912** | 10,181 | 7,104 |
| Net interest income | **3,767** | 2,932 | 2,587 |
| **Total net revenues** | **$36,616** | $32,730 | $30,790 |

In the table above:

- Investment banking consists of revenues (excluding net interest) from financial advisory and underwriting assignments, as well as derivative transactions directly related to these assignments. These activities are included in our Investment Banking segment.
- Investment management consists of revenues (excluding net interest) from providing investment management services to a diverse set of clients, as well as wealth advisory services and certain transaction services to high-net-worth individuals and families. These activities are included in our Investment Management segment.
- Commissions and fees consists of revenues from executing and clearing client transactions on major stock, options and futures exchanges worldwide, as well as over-the-counter (OTC) transactions. These activities are included in our Institutional Client Services and Investment Management segments.
- Market making consists of revenues (excluding net interest) from client execution activities related to making markets in interest rate products, credit products, mortgages, currencies, commodities and equity products. These activities are included in our Institutional Client Services segment.
- Other principal transactions consists of revenues (excluding net interest) from our investing activities and the origination of loans to provide financing to clients. In addition, other principal transactions includes revenues related to our consolidated investments. These activities are included in our Investing & Lending segment. Provision for credit losses, previously reported in other principal transactions revenues, is now reported as a separate line item in the consolidated statements of earnings. Previously reported amounts have been conformed to the current presentation.

**Operating Environment.** During 2018, our market-making activities reflected generally higher levels of volatility and improved client activity, compared with a low volatility environment in 2017. In investment banking, industry-wide mergers and acquisitions volumes increased compared with 2017, while industry-wide underwriting transactions decreased. Our other principal transactions revenues benefited from company-specific events, including sales, and strong corporate performance, while investments in public equities reflected losses, as global equity prices generally decreased in 2018, particularly towards the end of the year. In investment management, our assets under supervision increased reflecting net inflows in liquidity products, fixed income assets and equity assets, partially offset by depreciation in client assets, primarily in equity assets.

If market-making or investment banking activity levels decline, or assets under supervision decline, or asset prices continue to decline, net revenues would likely be negatively impacted. See "Segment Operating Results" for further information about the operating environment and material trends and uncertainties that may impact our results of operations.

During 2017, generally higher asset prices and tighter credit spreads were supportive of industry-wide underwriting activities, investment management performance and other principal transactions. However, low levels of volatility in equity, fixed income, currency and commodity markets continued to negatively affect our market-making activities.

### *2018 versus 2017*

Net revenues in the consolidated statements of earnings were $36.62 billion for 2018, 12% higher than 2017, primarily due to significantly higher market making revenues and net interest income, as well as higher investment management revenues and investment banking revenues.

**Non-Interest Revenues.** Investment banking revenues in the consolidated statements of earnings were $7.86 billion for 2018, 7% higher than 2017. Revenues in financial advisory were higher, reflecting an increase in industry-wide completed mergers and acquisitions volumes. Revenues in underwriting were slightly higher, due to significantly higher revenues in equity underwriting, driven by initial public offerings, partially offset by lower revenues in debt underwriting, reflecting a decline in leveraged finance activity.

Investment management revenues in the consolidated statements of earnings were $6.51 billion for 2018, 12% higher than 2017, primarily due to significantly higher incentive fees, as a result of harvesting. Management and other fees were also higher, reflecting higher average assets under supervision and the impact of the recently adopted revenue recognition standard, partially offset by shifts in the mix of client assets and strategies. See Note 3 to the consolidated financial statements for further information about ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)."

Commissions and fees in the consolidated statements of earnings were $3.20 billion for 2018, 5% higher than 2017, reflecting an increase in our listed cash equity and futures volumes, generally consistent with market volumes.

Market making revenues in the consolidated statements of earnings were $9.45 billion for 2018, 23% higher than 2017, due to significantly higher revenues in equity products, interest rate products and commodities. These increases were partially offset by significantly lower results in mortgages and lower revenues in credit products.

Other principal transactions revenues in the consolidated statements of earnings were $5.82 billion for 2018, 2% lower than 2017, reflecting net losses from investments in public equities compared with net gains in the prior year, partially offset by significantly higher net gains from investments in private equities, driven by company-specific events, including sales, and corporate performance.

**Net Interest Income.** Net interest income in the consolidated statements of earnings was $3.77 billion for 2018, 28% higher than 2017, reflecting an increase in interest income primarily due to the impact of higher interest rates on collateralized agreements, other interest-earning assets and deposits with banks, increases in total average loans receivable and financial instruments owned, and higher yields on financial instruments owned and loans receivable. The increase in interest income was partially offset by higher interest expense primarily due to the impact of higher interest rates on other interest-bearing liabilities, collateralized financings, deposits and long-term borrowings, and increases in total average long-term borrowings and deposits. See "Statistical Disclosures — Distribution of Assets, Liabilities and Shareholders' Equity" for further information about our sources of net interest income.

### *2017 versus 2016*

Net revenues in the consolidated statements of earnings were $32.73 billion for 2017, 6% higher than 2016, due to significantly higher other principal transactions revenues, and higher investment banking revenues, investment management revenues and net interest income. These increases were partially offset by significantly lower market making revenues and lower commissions and fees.

**Non-Interest Revenues.** Investment banking revenues in the consolidated statements of earnings were $7.37 billion for 2017, 18% higher than 2016. Revenues in financial advisory were higher compared with 2016, reflecting an increase in completed mergers and acquisitions transactions. Revenues in underwriting were significantly higher compared with 2016, due to significantly higher revenues in both debt underwriting, primarily reflecting an increase in industry-wide leveraged finance activity, and equity underwriting, reflecting an increase in industry-wide secondary offerings.

Investment management revenues in the consolidated statements of earnings were $5.80 billion for 2017, 7% higher than 2016, due to higher management and other fees, reflecting higher average assets under supervision, and higher transaction revenues.

Commissions and fees in the consolidated statements of earnings were $3.05 billion for 2017, 5% lower than 2016, reflecting a decline in our listed cash equity volumes in the U.S. Market volumes in the U.S. also declined.

Market making revenues in the consolidated statements of earnings were $7.66 billion for 2017, 23% lower than 2016, due to significantly lower revenues in commodities, currencies, credit products, interest rate products and equity derivative products. These results were partially offset by significantly higher revenues in equity cash products and significantly improved results in mortgages.

Other principal transactions revenues in the consolidated statements of earnings were $5.91 billion for 2017, 75% higher than 2016, primarily reflecting a significant increase in net gains from private equities, which were positively impacted by company-specific events and corporate performance. In addition, net gains from public equities were significantly higher, as global equity prices increased during the year.

**Net Interest Income.** Net interest income in the consolidated statements of earnings was $2.93 billion for 2017, 13% higher than 2016, reflecting an increase in interest income primarily due to the impact of higher interest rates on collateralized agreements, higher interest income from loans receivable due to higher yields and an increase in total average loans receivable, an increase in total average financial instruments owned, and the impact of higher interest rates on other interest-earning assets and deposits with banks. The increase in interest income was partially offset by higher interest expense primarily due to the impact of higher interest rates on other interest-bearing liabilities, an increase in total average long-term borrowings, and the impact of higher interest rates on interest-bearing deposits, short-term borrowings and collateralized financings. See "Statistical Disclosures — Distribution of Assets, Liabilities and Shareholders' Equity" for further information about our sources of net interest income.

## Provision for Credit Losses

Provision for credit losses consists of provision for credit losses on loans receivable and lending commitments held for investment. See Note 9 to the consolidated financial statements for further information about the provision for credit losses.

The table below presents the provision for credit losses.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Provision for credit losses | **$674** | $657 | $182 |

**2018 versus 2017.** Provision for credit losses in the consolidated statements of earnings was $674 million for 2018, compared with $657 million for 2017, as the higher provision for credit losses primarily related to consumer loan growth in 2018 was partially offset by an impairment of approximately $130 million on a secured loan in 2017.

**2017 versus 2016.** Provision for credit losses in the consolidated statements of earnings was $657 million for 2017, compared with $182 million for 2016, reflecting an increase in impairments, which included an impairment of approximately $130 million on a secured loan in 2017, and higher provision for credit losses primarily related to consumer loan growth.

## Operating Expenses

Our operating expenses are primarily influenced by compensation, headcount and levels of business activity. Compensation and benefits includes salaries, discretionary compensation, amortization of equity awards and other items such as benefits. Discretionary compensation is significantly impacted by, among other factors, the level of net revenues, overall financial performance, prevailing labor markets, business mix, the structure of our share-based compensation programs and the external environment. In addition, see "Use of Estimates" for further information about expenses that may arise from litigation and regulatory proceedings.

The table below presents operating expenses by line item and headcount.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Compensation and benefits | **$12,328** | $11,653 | $11,448 |
| Brokerage, clearing, exchange and distribution fees | **3,200** | 2,876 | 2,823 |
| Market development | **740** | 588 | 457 |
| Communications and technology | **1,023** | 897 | 809 |
| Depreciation and amortization | **1,328** | 1,152 | 998 |
| Occupancy | **809** | 733 | 788 |
| Professional fees | **1,214** | 1,165 | 1,081 |
| Other expenses | **2,819** | 1,877 | 1,900 |
| **Total operating expenses** | **$23,461** | $20,941 | $20,304 |
| **Headcount at period-end** | **36,600** | 33,600 | 32,400 |

In the table above, the following reclassifications have been made to previously reported amounts to conform to the current presentation:

- Regulatory-related fees that are paid to exchanges are now reported in brokerage, clearing, exchange and distribution fees. Previously such amounts were reported in other expenses.
- Headcount consists of our employees, and excludes consultants and temporary staff previously reported as part of total staff. As a result, expenses related to these consultants and temporary staff are now reported in professional fees. Previously such amounts were reported in compensation and benefits expenses.

**2018 versus 2017.** Operating expenses in the consolidated statements of earnings were $23.46 billion for 2018, 12% higher than 2017. Our efficiency ratio (total operating expenses divided by total net revenues) for 2018 was 64.1%, compared with 64.0% for 2017.

The increase in operating expenses compared with 2017 was primarily due to higher compensation and benefits expenses, reflecting improved operating performance, and significantly higher net provisions for litigation and regulatory proceedings. Brokerage, clearing, exchange and distribution fees were also higher, reflecting an increase in activity levels, and technology expenses increased, reflecting higher expenses related to computing services. In addition, expenses related to consolidated investments and our digital lending and deposit platform increased, with the increases primarily in depreciation and amortization expenses, market development expenses and other expenses. The increase compared with 2017 also included $297 million related to the recently adopted revenue recognition standard. See Note 3 to the consolidated financial statements for further information about ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)."

Net provisions for litigation and regulatory proceedings for 2018 were $844 million compared with $188 million for 2017. 2018 included a $132 million charitable contribution to Goldman Sachs Gives, our donor-advised fund. Compensation was reduced to fund this charitable contribution to Goldman Sachs Gives. We ask our participating managing directors to make recommendations regarding potential charitable recipients for this contribution.

As of December 2018, headcount increased 9% compared with December 2017, reflecting an increase in technology professionals and investments in new business initiatives.

**2017 versus 2016.** Operating expenses in the consolidated statements of earnings were $20.94 billion for 2017, 3% higher than 2016. Our efficiency ratio for 2017 was 64.0% compared with 65.9% for 2016.

The increase in operating expenses compared with 2016 was primarily driven by slightly higher compensation and benefits expenses and our investments to fund growth. Higher expenses related to consolidated investments and our digital lending and deposit platform were primarily included in depreciation and amortization expenses, market development expenses and other expenses. In addition, technology expenses increased, reflecting higher expenses related to cloud-based services and software depreciation, and professional fees increased, primarily related to consulting costs. These increases were partially offset by lower net provisions for litigation and regulatory proceedings, and lower occupancy expenses (primarily related to exit costs in 2016).

Net provisions for litigation and regulatory proceedings for 2017 were $188 million compared with $396 million for 2016. 2017 included a $127 million charitable contribution to Goldman Sachs Gives, our donor-advised fund. Compensation was reduced to fund this charitable contribution to Goldman Sachs Gives. We ask our participating managing directors to make recommendations regarding potential charitable recipients for this contribution.

As of December 2017, headcount increased 4% compared with December 2016, reflecting an increase in employees of our digital lending and deposit platform, and in support of our regulatory efforts.

### Provision for Taxes

The effective income tax rate for 2018 was 16.2%, down from 61.5% for 2017, as 2017 included the estimated impact of Tax Legislation, which increased our effective income tax rate by 39.5 percentage points. Additionally, the decrease compared with 2017 reflected the impact of the lower U.S. corporate income tax rate in 2018. The estimated impact of Tax Legislation was an increase in income tax expense of $4.40 billion for 2017. During 2018, we finalized this estimate to reflect the impact of updated information, including subsequent guidance issued by the IRS, resulting in a $487 million income tax benefit for 2018.

The effective income tax rate for 2017 was 61.5%, up from 28.2% for 2016. The increase compared with 2016 was primarily due to the estimated impact of Tax Legislation, which was enacted on December 22, 2017, partially offset by tax benefits on the settlement of employee share-based awards in accordance with ASU No. 2016-09.

Effective January 1, 2018, Tax Legislation reduced the U.S. corporate tax rate to 21%, eliminated tax deductions for certain expenses and enacted two new taxes, Base Erosion and Anti-Abuse Tax (BEAT) and Global Intangible Low Taxed Income (GILTI). BEAT is an alternative minimum tax that applies to banks that pay more than 2% of total deductible expenses to certain foreign subsidiaries. GILTI is effectively a 10.5% tax, before allowable credits for foreign taxes paid, on the annual taxable income of certain foreign subsidiaries. Income tax expense associated with GILTI is recognized as incurred. During 2018, the IRS issued proposed regulations relating to BEAT and GILTI. Our 2018 effective income tax rate includes estimates for BEAT and GILTI that are based on our current interpretation of these proposed regulations. We do not expect that the finalization of these proposed regulations will have a material impact on these estimates.

Based on our current interpretations of the rules and legislative guidance to date, we expect our 2019 tax rate to be between 22% and 23%, excluding the impact of equity-based compensation.

### Segment Operating Results

The table below presents the net revenues, provision for credit losses, operating expenses and pre-tax earnings by segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Investment Banking** | | | |
| Net revenues | **$ 7,862** | $ 7,371 | $ 6,273 |
| Operating expenses | **4,346** | 3,526 | 3,437 |
| **Pre-tax earnings** | **$ 3,516** | $ 3,845 | $ 2,836 |
| **Institutional Client Services** | | | |
| Net revenues | **$13,482** | $11,902 | $14,467 |
| Operating expenses | **10,351** | 9,692 | 9,713 |
| **Pre-tax earnings** | **$ 3,131** | $ 2,210 | $ 4,754 |
| **Investing & Lending** | | | |
| Net revenues | **$ 8,250** | $ 7,238 | $ 4,262 |
| Provision for credit losses | **674** | 657 | 182 |
| Operating expenses | **3,365** | 2,796 | 2,386 |
| **Pre-tax earnings** | **$ 4,211** | $ 3,785 | $ 1,694 |
| **Investment Management** | | | |
| Net revenues | **$ 7,022** | $ 6,219 | $ 5,788 |
| Operating expenses | **5,267** | 4,800 | 4,654 |
| **Pre-tax earnings** | **$ 1,755** | $ 1,419 | $ 1,134 |
| **Total net revenues** | **$36,616** | $32,730 | $30,790 |
| **Provision for credit losses** | **674** | 657 | 182 |
| **Total operating expenses** | **23,461** | 20,941 | 20,304 |
| **Total pre-tax earnings** | **$12,481** | $11,132 | $10,304 |

In the table above:

- Provision for credit losses, previously reported in Investing & Lending segment net revenues, is now reported as a separate line item. Previously reported amounts have been conformed to the current presentation.
- All operating expenses have been allocated to our segments except for charitable contributions of $132 million for 2018, $127 million for 2017 and $114 million for 2016.

Net revenues in our segments include allocations of interest income and expense to specific securities, commodities and other positions in relation to the cash generated by, or funding requirements of, such positions. See Note 25 to the consolidated financial statements for further information about our business segments.

Our cost drivers taken as a whole, compensation, headcount and levels of business activity, are broadly similar in each of our business segments. Compensation and benefits expenses within our segments reflect, among other factors, our overall performance, as well as the performance of individual businesses. Consequently, pre-tax margins in one segment of our business may be significantly affected by the performance of our other business segments. A description of segment operating results follows.

### Investment Banking

Our Investment Banking segment consists of:

**Financial Advisory.** Includes strategic advisory assignments with respect to mergers and acquisitions, divestitures, corporate defense activities, restructurings, spin-offs, risk management and derivative transactions directly related to these client advisory assignments.

**Underwriting.** Includes public offerings and private placements, including local and cross-border transactions and acquisition financing, of a wide range of securities and other financial instruments, including loans, and derivative transactions directly related to these client underwriting activities.

The table below presents the operating results of our Investment Banking segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Financial Advisory | **$3,507** | $3,188 | $2,932 |
| Equity underwriting | **1,646** | 1,243 | 891 |
| Debt underwriting | **2,709** | 2,940 | 2,450 |
| Total Underwriting | **4,355** | 4,183 | 3,341 |
| Total net revenues | **7,862** | 7,371 | 6,273 |
| Operating expenses | **4,346** | 3,526 | 3,437 |
| **Pre-tax earnings** | **$3,516** | $3,845 | $2,836 |

The table below presents our financial advisory and underwriting transaction volumes.

| | Year Ended December | | |
|---|---|---|---|
| *$ in billions* | **2018** | 2017 | 2016 |
| Announced mergers and acquisitions | **$1,292** | $ 877 | $ 901 |
| Completed mergers and acquisitions | **$1,217** | $ 942 | $1,215 |
| Equity and equity-related offerings | **$ 67** | $ 69 | $ 49 |
| Debt offerings | **$ 257** | $ 289 | $ 271 |

In the table above:

- Volumes are per Dealogic.
- Announced and completed mergers and acquisitions volumes are based on full credit to each of the advisors in a transaction. Equity and equity-related offerings and debt offerings are based on full credit for single book managers and equal credit for joint book managers. Transaction volumes may not be indicative of net revenues in a given period. In addition, transaction volumes for prior periods may vary from amounts previously reported due to the subsequent withdrawal or a change in the value of a transaction.
- Equity and equity-related offerings includes Rule 144A and public common stock offerings, convertible offerings and rights offerings.
- Debt offerings includes non-convertible preferred stock, mortgage-backed securities, asset-backed securities and taxable municipal debt. Includes publicly registered and Rule 144A issues. Excludes leveraged loans.

**Operating Environment.** During 2018, industry-wide announced and completed mergers and acquisitions activity was strong and volumes increased compared with 2017.

In underwriting, industry-wide equity and debt underwriting transactions decreased compared with 2017, reflecting a challenging market environment for financing towards the end of 2018. However, demand for initial public offerings increased compared with 2017.

In the future, if industry-wide mergers and acquisitions volumes decline, or if equity or debt underwriting transactions continue to decline, net revenues in Investment Banking would likely be negatively impacted.

During 2017, Investment Banking operated in an environment characterized by solid industry-wide mergers and acquisitions transactions, although volumes declined compared with 2016. Industry-wide debt underwriting offerings remained strong and industry-wide equity underwriting offerings increased significantly compared with 2016.

**2018 versus 2017.** Net revenues in Investment Banking were $7.86 billion for 2018, 7% higher than 2017.

Net revenues in Financial Advisory were $3.51 billion, 10% higher than 2017, reflecting an increase in industry-wide completed mergers and acquisitions volumes.

Net revenues in Underwriting were $4.36 billion, 4% higher than 2017, due to significantly higher net revenues in equity underwriting, driven by initial public offerings, partially offset by lower net revenues in debt underwriting, reflecting a decline in leveraged finance activity.

Operating expenses were $4.35 billion for 2018, 23% higher than 2017, primarily due to higher net provisions for litigation and regulatory proceedings, increased compensation and benefits expenses, reflecting higher net revenues, and the impact of the recently adopted revenue recognition standard. Pre-tax earnings were $3.52 billion in 2018, 9% lower than 2017. See Note 3 to the consolidated financial statements for further information about ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)."

As of December 2018, our investment banking transaction backlog increased compared with December 2017, primarily due to significantly higher estimated net revenues from potential advisory transactions. Estimated net revenues from potential debt underwriting transactions were also higher, while estimated net revenues from equity underwriting transactions were essentially unchanged.

Our investment banking transaction backlog represents an estimate of our future net revenues from investment banking transactions where we believe that future revenue realization is more likely than not. We believe changes in our investment banking transaction backlog may be a useful indicator of client activity levels which, over the long term, impact our net revenues. However, the time frame for completion and corresponding revenue recognition of transactions in our backlog varies based on the nature of the assignment, as certain transactions may remain in our backlog for longer periods of time and others may enter and leave within the same reporting period. In addition, our transaction backlog is subject to certain limitations, such as assumptions about the likelihood that individual client transactions will occur in the future. Transactions may be cancelled or modified, and transactions not included in the estimate may also occur.

**2017 versus 2016.** Net revenues in Investment Banking were $7.37 billion for 2017, 18% higher than 2016.

Net revenues in Financial Advisory were $3.19 billion, 9% higher than 2016, reflecting an increase in completed mergers and acquisitions transactions.

Net revenues in Underwriting were $4.18 billion, 25% higher than 2016, due to significantly higher net revenues in both debt underwriting, primarily reflecting an increase in industry-wide leveraged finance activity, and equity underwriting, reflecting an increase in industry-wide secondary offerings.

Operating expenses were $3.53 billion for 2017, 3% higher than 2016, due to increased compensation and benefits expenses, reflecting higher net revenues. Pre-tax earnings were $3.85 billion in 2017, 36% higher than 2016.

As of December 2017, our investment banking transaction backlog increased compared with December 2016, due to significantly higher estimated net revenues from potential debt underwriting transactions and significantly higher estimated net revenues from potential equity underwriting transactions, primarily in initial public offerings. These increases were partially offset by lower estimated net revenues from potential advisory transactions, principally related to mergers and acquisitions.

### Institutional Client Services

Our Institutional Client Services segment consists of:

**FICC Client Execution.** Includes client execution activities related to making markets in both cash and derivative instruments for interest rate products, credit products, mortgages, currencies and commodities.

- **Interest Rate Products.** Government bonds (including inflation-linked securities) across maturities, other government-backed securities, securities sold under agreements to repurchase (repurchase agreements), and interest rate swaps, options and other derivatives.
- **Credit Products.** Investment-grade corporate securities, high-yield securities, credit derivatives, exchange-traded funds, bank and bridge loans, municipal securities, emerging market and distressed debt, and trade claims.
- **Mortgages.** Commercial mortgage-related securities, loans and derivatives, residential mortgage-related securities, loans and derivatives (including U.S. government agency-issued collateralized mortgage obligations and other securities and loans), and other asset-backed securities, loans and derivatives.
- **Currencies.** Currency options, spot/forwards and other derivatives on G-10 currencies and emerging-market products.
- **Commodities.** Commodity derivatives and, to a lesser extent, physical commodities, involving crude oil and petroleum products, natural gas, base, precious and other metals, electricity, coal, agricultural and other commodity products.

**Equities.** Includes client execution activities related to making markets in equity products and commissions and fees from executing and clearing institutional client transactions on major stock, options and futures exchanges worldwide, as well as OTC transactions. Equities also includes our securities services business, which provides financing, securities lending and other prime brokerage services to institutional clients, including hedge funds, mutual funds, pension funds and foundations, and generates revenues primarily in the form of interest rate spreads or fees.

### *Market-Making Activities*

As a market maker, we facilitate transactions in both liquid and less liquid markets, primarily for institutional clients, such as corporations, financial institutions, investment funds and governments, to assist clients in meeting their investment objectives and in managing their risks. In this role, we seek to earn the difference between the price at which a market participant is willing to sell an instrument to us and the price at which another market participant is willing to buy it from us, and vice versa (i.e., bid/offer spread). In addition, we maintain inventory, typically for a short period of time, in response to, or in anticipation of, client demand. We also hold inventory to actively manage our risk exposures that arise from these market-making activities. Our market-making inventory is recorded in financial instruments owned (long positions) or financial instruments sold, but not yet purchased (short positions) in our consolidated statements of financial condition.

Our results are influenced by a combination of interconnected drivers, including (i) client activity levels and transactional bid/offer spreads (collectively, client activity), and (ii) changes in the fair value of our inventory and interest income and interest expense related to the holding, hedging and funding of our inventory (collectively, market-making inventory changes). Due to the integrated nature of our market-making activities, disaggregation of net revenues into client activity and market-making inventory changes is judgmental and has inherent complexities and limitations.

The amount and composition of our net revenues vary over time as these drivers are impacted by multiple interrelated factors affecting economic and market conditions, including volatility and liquidity in the market, changes in interest rates, currency exchange rates, credit spreads, equity prices and commodity prices, investor confidence, and other macroeconomic concerns and uncertainties.

In general, assuming all other market-making conditions remain constant, increases in client activity levels or bid/offer spreads tend to result in increases in net revenues, and decreases tend to have the opposite effect. However, changes in market-making conditions can materially impact client activity levels and bid/offer spreads, as well as the fair value of our inventory. For example, a decrease in liquidity in the market could have the impact of (i) increasing our bid/offer spread, (ii) decreasing investor confidence and thereby decreasing client activity levels, and (iii) wider credit spreads on our inventory positions.

The table below presents the operating results of our Institutional Client Services segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| FICC Client Execution | **$ 5,882** | $ 5,299 | $ 7,556 |
| Equities client execution | **2,835** | 2,046 | 2,194 |
| Commissions and fees | **3,055** | 2,920 | 3,078 |
| Securities services | **1,710** | 1,637 | 1,639 |
| Total Equities | **7,600** | 6,603 | 6,911 |
| Total net revenues | **13,482** | 11,902 | 14,467 |
| Operating expenses | **10,351** | 9,692 | 9,713 |
| **Pre-tax earnings** | **$ 3,131** | $ 2,210 | $ 4,754 |

The table below presents the net revenues of our Institutional Client Services segment by line item in the consolidated statements of earnings.

| *$ in millions* | FICC Client Execution | Total Equities | Institutional Client Services |
|---|---|---|---|
| **Year Ended December 2018** | | | |
| Market making | **$ 5,211** | **$ 4,240** | **$ 9,451** |
| Commissions and fees | **–** | **3,055** | **3,055** |
| Net interest income | **671** | **305** | **976** |
| **Total net revenues** | **$ 5,882** | **$ 7,600** | **$13,482** |
| Year Ended December 2017 | | | |
| Market making | $ 4,403 | $ 3,257 | $ 7,660 |
| Commissions and fees | – | 2,920 | 2,920 |
| Net interest income | 896 | 426 | 1,322 |
| Total net revenues | $ 5,299 | $ 6,603 | $11,902 |
| Year Ended December 2016 | | | |
| Market making | $ 6,803 | $ 3,130 | $ 9,933 |
| Commissions and fees | – | 3,078 | 3,078 |
| Net interest income | 753 | 703 | 1,456 |
| Total net revenues | $ 7,556 | $ 6,911 | $14,467 |

In the table above:

- The difference between commissions and fees and those in the consolidated statements of earnings represents commissions and fees included in our Investment Management segment.
- See "Net Revenues" for further information about market making revenues, commissions and fees, and net interest income. See Note 25 to the consolidated financial statements for net interest income by business segment.
- The primary driver of net revenues for FICC Client Execution was client activity.

**Operating Environment.** During 2018, Institutional Client Services operated in an environment characterized by generally higher levels of volatility and improved client activity, compared with a low volatility environment in 2017. The average daily VIX for 2018 increased to 17, reflecting periods of high volatility in the first and fourth quarters of 2018, compared with 11 for 2017. In 2018, global equity markets generally decreased (with the MSCI World Index down 11%) and in credit markets, spreads generally widened (with U.S. high-yield credit spreads wider by 139 basis points), both particularly towards the end of the year. Oil prices decreased to $45 per barrel (WTI), while natural gas prices were essentially unchanged at $2.94 per million British thermal units compared to the end of 2017. If activity levels decline, net revenues in Institutional Client Services would likely be negatively impacted. See "Business Environment" for further information about economic and market conditions in the global operating environment during the year.

During 2017, low volatility levels in equity, fixed income, currency and commodity markets impacted the operating environment for Institutional Client Services. This negatively affected client activity across businesses, particularly in FICC Client Execution. Although market-making conditions were challenged, global equity markets increased compared with 2016, and credit spreads generally tightened.

**2018 versus 2017.** Net revenues in Institutional Client Services were $13.48 billion for 2018, 13% higher than 2017.

Net revenues in FICC Client Execution were $5.88 billion, 11% higher than 2017, primarily reflecting higher client activity.

The following provides information about our FICC Client Execution net revenues by business, compared with 2017 results:

- Net revenues in commodities were significantly higher, reflecting the impact of improved market-making conditions on our inventory, compared with challenging conditions in 2017, and higher client activity.
- Net revenues in currencies were significantly higher, primarily reflecting higher client activity.
- Net revenues in interest rate products and mortgages were both slightly lower, reflecting lower client activity.
- Net revenues in credit products were essentially unchanged, reflecting the impact of challenging market-making conditions on our inventory, particularly during the fourth quarter of 2018, offset by higher client activity.

For 2018, approximately 90% of the net revenues in FICC Client Execution were generated from market intermediation and approximately 10% were generated from financing. FICC Client Execution financing net revenues include net revenues primarily from short-term repurchase agreement activities.

Net revenues in Equities were $7.60 billion, 15% higher than 2017, primarily due to significantly higher net revenues in equities client execution, reflecting significantly higher net revenues in both cash products and derivatives. In addition, commissions and fees were higher, reflecting an increase in our listed cash equity and futures volumes, generally consistent with market volumes. Net revenues in securities services were slightly higher.

For 2018, approximately 60% of the net revenues in Equities were generated from market intermediation and approximately 40% were generated from financing. Equities financing net revenues include net revenues from prime brokerage and other financing activities, including securities lending, margin lending and swaps.

Operating expenses were $10.35 billion for 2018, 7% higher than 2017, primarily due to increased compensation and benefits expenses, reflecting higher net revenues, higher net provisions for litigation and regulatory proceedings, and higher brokerage, clearing and exchange fees. Pre-tax earnings were $3.13 billion in 2018, 42% higher than 2017.

**2017 versus 2016.** Net revenues in Institutional Client Services were $11.90 billion for 2017, 18% lower than 2016.

Net revenues in FICC Client Execution were $5.30 billion, 30% lower than 2016, reflecting significantly lower client activity. Approximately one-third of the decline in FICC Client Execution net revenues was due to significantly lower results in commodities.

The following provides information about our FICC Client Execution net revenues by business, compared with 2016 results:

- Net revenues in commodities were significantly lower, reflecting the impact of challenging market-making conditions on our inventory.
- Net revenues in interest rate products were significantly lower, reflecting lower client activity.
- Net revenues in currencies were significantly lower, reflecting lower client activity and the impact of challenging market-making conditions on our inventory.
- Net revenues in credit products were significantly lower, reflecting lower client activity.
- Net revenues in mortgages were significantly higher, reflecting the impact of favorable market-making conditions on our inventory, including generally tighter spreads, compared with a challenging 2016.

Net revenues in Equities were $6.60 billion, 4% lower than 2016, primarily due to lower commissions and fees, reflecting a decline in our listed cash equity volumes in the U.S. Market volumes in the U.S. also declined. In addition, net revenues in equities client execution were lower, reflecting lower net revenues in derivatives, partially offset by higher net revenues in cash products. Net revenues in securities services were essentially unchanged.

Operating expenses were $9.69 billion for 2017, essentially unchanged compared with 2016, due to decreased compensation and benefits expenses, reflecting lower net revenues, largely offset by increased technology expenses, reflecting higher expenses related to cloud-based services and software depreciation, and increased consulting costs. Pre-tax earnings were $2.21 billion in 2017, 54% lower than 2016.

### Investing & Lending

Investing & Lending includes our investing activities and the origination of loans, including our relationship lending activities, to provide financing to clients. These investments and loans are typically longer-term in nature. We make investments, some of which are consolidated, including through our Merchant Banking business and our Special Situations Group, in debt securities and loans, public and private equity securities, infrastructure and real estate entities. Some of these investments are made indirectly through funds that we manage. We also make unsecured loans through our digital platform, *Marcus: by Goldman Sachs* and secured loans through our digital platform, *Goldman Sachs Private Bank Select*.

The table below presents the operating results of our Investing & Lending segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Equity securities | **$4,455** | $4,578 | $2,573 |
| Debt securities and loans | **3,795** | 2,660 | 1,689 |
| Total net revenues | **8,250** | 7,238 | 4,262 |
| Provision for credit losses | **674** | 657 | 182 |
| Operating expenses | **3,365** | 2,796 | 2,386 |
| **Pre-tax earnings** | **$4,211** | $3,785 | $1,694 |

**Operating Environment.** During 2018, our investments in private equities benefited from company-specific events, including sales, and strong corporate performance, while investments in public equities reflected losses, as global equity prices generally decreased. Results for our investments in debt securities and loans reflected continued growth in loans receivables, resulting in higher net interest income. If macroeconomic concerns negatively affect corporate performance or the origination of loans, or if global equity prices continue to decline, net revenues in Investing & Lending would likely be negatively impacted.

During 2017, generally higher global equity prices and tighter credit spreads contributed to a favorable environment for our equity and debt investments. Results also reflected net gains from company-specific events, including sales, and corporate performance.

**2018 versus 2017.** Net revenues in Investing & Lending were $8.25 billion for 2018, 14% higher than 2017.

Net revenues in equity securities were $4.46 billion, 3% lower than 2017, reflecting net losses from investments in public equities (2018 included $183 million of net losses) compared with net gains in the prior year, partially offset by significantly higher net gains from investments in private equities (2018 included $4.64 billion of net gains), driven by company-specific events, including sales, and corporate performance. For 2018, 60% of the net revenues in equity securities were generated from corporate investments and 40% were generated from real estate.

Net revenues in debt securities and loans were $3.80 billion, 43% higher than 2017, primarily driven by significantly higher net interest income. 2018 included net interest income of approximately $2.70 billion compared with approximately $1.80 billion in 2017.

Provision for credit losses was $674 million for 2018, compared with $657 million for 2017, as the higher provision for credit losses primarily related to consumer loan growth in 2018 was partially offset by an impairment of approximately $130 million on a secured loan in 2017.

Operating expenses were $3.37 billion for 2018, 20% higher than 2017, primarily due to increased expenses related to consolidated investments and our digital lending and deposit platform, and increased compensation and benefits expenses, reflecting higher net revenues. Pre-tax earnings were $4.21 billion in 2018, 11% higher than 2017.

**2017 versus 2016.** Net revenues in Investing & Lending were $7.24 billion for 2017, 70% higher than 2016.

Net revenues in equity securities were $4.58 billion, 78% higher than 2016, primarily reflecting a significant increase in net gains from private equities (2017 included $3.82 billion of net gains), which were positively impacted by company-specific events and corporate performance. In addition, net gains from public equities (2017 included $762 million of net gains) were significantly higher, as global equity prices increased during the year. For 2017, 64% of the net revenues in equity securities were generated from corporate investments and 36% were generated from real estate.

Net revenues in debt securities and loans were $2.66 billion, 57% higher than 2016, reflecting significantly higher net interest income (2017 included approximately $1.80 billion of net interest income).

Provision for credit losses was $657 million for 2017, compared with $182 million for 2016, reflecting an increase in impairments, which included an impairment of approximately $130 million on a secured loan in 2017, and higher provision for credit losses primarily related to consumer loan growth.

Operating expenses were $2.80 billion for 2017, 17% higher than 2016, due to increased compensation and benefits expenses, reflecting higher net revenues, increased expenses related to consolidated investments, and increased expenses related to our digital lending and deposit platform. Pre-tax earnings were $3.79 billion in 2017 compared with $1.69 billion in 2016.

### Investment Management

Investment Management provides investment management services and offers investment products (primarily through separately managed accounts and commingled vehicles, such as mutual funds and private investment funds) across all major asset classes to a diverse set of institutional and individual clients. Investment Management also offers wealth advisory services provided by our subsidiary, The Ayco Company, L.P., including portfolio management and financial planning and counseling, and brokerage and other transaction services to high-net-worth individuals and families.

Assets under supervision (AUS) include client assets where we earn a fee for managing assets on a discretionary basis. This includes net assets in our mutual funds, hedge funds, credit funds and private equity funds (including real estate funds), and separately managed accounts for institutional and individual investors. Assets under supervision also include client assets invested with third-party managers, bank deposits and advisory relationships where we earn a fee for advisory and other services, but do not have investment discretion. Assets under supervision do not include the self-directed brokerage assets of our clients. Long-term assets under supervision represent assets under supervision excluding liquidity products. Liquidity products represent money market and bank deposit assets.

Assets under supervision typically generate fees as a percentage of net asset value, which vary by asset class, distribution channel and the type of services provided, and are affected by investment performance, as well as asset inflows and redemptions. Asset classes such as alternative investment and equity assets typically generate higher fees relative to fixed income and liquidity product assets. The average effective management fee (which excludes non-asset-based fees) we earned on our assets under supervision was 34 basis points for 2018 and 35 basis points for both 2017 and 2016.

In certain circumstances, we are also entitled to receive incentive fees based on a percentage of a fund's or a separately managed account's return, or when the return exceeds a specified benchmark or other performance targets.

The table below presents the operating results of our Investment Management segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Management and other fees | **$5,438** | $5,144 | $4,798 |
| Incentive fees | **830** | 417 | 421 |
| Transaction revenues | **754** | 658 | 569 |
| Total net revenues | **7,022** | 6,219 | 5,788 |
| Operating expenses | **5,267** | 4,800 | 4,654 |
| **Pre-tax earnings** | **$1,755** | $1,419 | $1,134 |

The table below presents period-end assets under supervision by asset class, distribution channel, region and vehicle.

| | As of December | | |
|---|---|---|---|
| *$ in billions* | **2018** | 2017 | 2016 |
| **Asset Class** | | | |
| Alternative investments | **$ 167** | $ 168 | $ 154 |
| Equity | **301** | 321 | 266 |
| Fixed income | **677** | 660 | 601 |
| Total long-term AUS | **1,145** | 1,149 | 1,021 |
| Liquidity products | **397** | 345 | 358 |
| **Total AUS** | **$1,542** | $1,494 | $1,379 |
| **Distribution Channel** | | | |
| Institutional | **$ 575** | $ 576 | $ 511 |
| High-net-worth individuals | **455** | 458 | 413 |
| Third-party distributed | **512** | 460 | 455 |
| **Total AUS** | **$1,542** | $1,494 | $1,379 |
| **Region** | | | |
| Americas | **$1,151** | $1,120 | $1,042 |
| Europe, Middle East and Africa | **239** | 229 | 211 |
| Asia | **152** | 145 | 126 |
| **Total AUS** | **$1,542** | $1,494 | $1,379 |
| **Vehicle** | | | |
| Separate accounts | **$ 867** | $ 857 | $ 763 |
| Public funds | **506** | 482 | 469 |
| Private funds and other | **169** | 155 | 147 |
| **Total AUS** | **$1,542** | $1,494 | $1,379 |

In the table above, alternative investments primarily includes hedge funds, credit funds, private equity, real estate, currencies, commodities and asset allocation strategies.

The table below presents changes in assets under supervision.

| | Year Ended December | | |
|---|---|---|---|
| *$ in billions* | **2018** | 2017 | 2016 |
| Beginning balance | **$1,494** | $1,379 | $1,252 |
| Net inflows/(outflows): | | | |
| Alternative investments | **1** | 15 | 5 |
| Equity | **13** | 2 | (3) |
| Fixed income | **23** | 25 | 40 |
| Total long-term AUS net inflows/(outflows) | **37** | 42 | 42 |
| Liquidity products | **52** | (13) | 52 |
| Total AUS net inflows/(outflows) | **89** | 29 | 94 |
| Net market appreciation/(depreciation) | **(41)** | 86 | 33 |
| **Ending balance** | **$1,542** | $1,494 | $1,379 |

In the table above, total AUS net inflows/(outflows) for 2017 included $23 billion of inflows ($20 billion in long-term AUS and $3 billion in liquidity products) in connection with the acquisition of a portion of Verus Investors' outsourced chief investment officer business (Verus acquisition) and $5 billion of equity asset outflows in connection with the divestiture of our local Australian-focused investment capabilities and fund platform (Australian divestiture).

The table below presents average monthly assets under supervision by asset class.

| | Average for the Year Ended December | | |
|---|---|---|---|
| *$ in billions* | **2018** | 2017 | 2016 |
| Alternative investments | **$ 171** | $ 162 | $ 149 |
| Equity | **329** | 292 | 256 |
| Fixed income | **665** | 633 | 578 |
| Total long-term AUS | **1,165** | 1,087 | 983 |
| Liquidity products | **352** | 330 | 326 |
| **Total AUS** | **$1,517** | $1,417 | $1,309 |

**Operating Environment.** During 2018, our assets under supervision increased reflecting net inflows in liquidity products, fixed income assets and equity assets. This increase was partially offset by depreciation in our client assets, primarily in equity assets, as global equity prices generally decreased in 2018, particularly towards the end of the year. The mix of our average assets under supervision between long-term assets under supervision and liquidity products during 2018 was essentially unchanged compared with 2017. In the future, if asset prices continue to decline, or investors continue to favor assets that typically generate lower fees or investors withdraw their assets, net revenues in Investment Management would likely be negatively impacted.

During 2017, Investment Management operated in an environment characterized by generally higher asset prices, resulting in appreciation in both equity and fixed income assets. Our long-term assets under supervision increased from net inflows primarily in fixed income and alternative investment assets. These increases were partially offset by net outflows in liquidity products. As a result, the mix of our average assets under supervision during 2017 shifted slightly from liquidity products to long-term assets under supervision compared to the mix at the end of 2016.

**2018 versus 2017.** Net revenues in Investment Management were $7.02 billion for 2018, 13% higher than 2017, primarily due to significantly higher incentive fees, as a result of harvesting. Management and other fees were also higher, reflecting higher average assets under supervision and the impact of the recently adopted revenue recognition standard, partially offset by shifts in the mix of client assets and strategies. In addition, transaction revenues were higher. See Note 3 to the consolidated financial statements for further information about ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)."

During 2018, total assets under supervision increased $48 billion to $1.54 trillion. Long-term assets under supervision decreased $4 billion, including net market depreciation of $41 billion primarily in equity assets, largely offset by net inflows of $37 billion, primarily in fixed income and equity assets. Liquidity products increased $52 billion.

Operating expenses were $5.27 billion for 2018, 10% higher than 2017, primarily due to the impact of the recently adopted revenue recognition standard and increased compensation and benefits expenses, reflecting higher net revenues. Pre-tax earnings were $1.76 billion in 2018, 24% higher than 2017. See Note 3 to the consolidated financial statements for further information about ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)."

**2017 versus 2016.** Net revenues in Investment Management were $6.22 billion for 2017, 7% higher than 2016, due to higher management and other fees, reflecting higher average assets under supervision, and higher transaction revenues.

During 2017, total assets under supervision increased $115 billion to $1.49 trillion. Long-term assets under supervision increased $128 billion, including net market appreciation of $86 billion, primarily in equity and fixed income assets, and net inflows of $42 billion (which includes $20 billion of inflows in connection with the Verus acquisition and $5 billion of equity asset outflows in connection with the Australian divestiture), primarily in fixed income and alternative investment assets. Liquidity products decreased $13 billion (which includes $3 billion of inflows in connection with the Verus acquisition).

Operating expenses were $4.80 billion for 2017, 3% higher than 2016, primarily due to increased compensation and benefits expenses, reflecting higher net revenues. Pre-tax earnings were $1.42 billion in 2017, 25% higher than 2016.

## Geographic Data

See Note 25 to the consolidated financial statements for a summary of our total net revenues, pre-tax earnings and net earnings by geographic region.

## Balance Sheet and Funding Sources

### Balance Sheet Management

One of our risk management disciplines is our ability to manage the size and composition of our balance sheet. While our asset base changes due to client activity, market fluctuations and business opportunities, the size and composition of our balance sheet also reflects factors including (i) our overall risk tolerance, (ii) the amount of equity capital we hold and (iii) our funding profile, among other factors. See "Equity Capital Management and Regulatory Capital — Equity Capital Management" for information about our equity capital management process.

Although our balance sheet fluctuates on a day-to-day basis, our total assets at quarter-end and year-end dates are generally not materially different from those occurring within our reporting periods.

In order to ensure appropriate risk management, we seek to maintain a sufficiently liquid balance sheet and have processes in place to dynamically manage our assets and liabilities, which include (i) balance sheet planning, (ii) balance sheet limits, (iii) monitoring of key metrics and (iv) scenario analyses.

**Balance Sheet Planning.** We prepare a balance sheet plan that combines our projected total assets and composition of assets with our expected funding sources over a three-year time horizon. This plan is reviewed quarterly and may be adjusted in response to changing business needs or market conditions. The objectives of this planning process are:

- To develop our balance sheet projections, taking into account the general state of the financial markets and expected business activity levels, as well as regulatory requirements;
- To allow Treasury and our independent risk oversight and control functions to objectively evaluate balance sheet limit requests from our revenue-producing units in the context of our overall balance sheet constraints, including our liability profile and equity capital levels, and key metrics; and
- To inform the target amount, tenor and type of funding to raise, based on our projected assets and contractual maturities.

Treasury and our independent risk oversight and control functions, along with our revenue-producing units, review current and prior period information and expectations for the year to prepare our balance sheet plan. The specific information reviewed includes asset and liability size and composition, limit utilization, risk and performance measures, and capital usage.

Our consolidated balance sheet plan, including our balance sheets by business, funding projections and projected key metrics, is reviewed and approved by the Firmwide Asset Liability Committee and the Risk Governance Committee. See "Risk Management — Overview and Structure of Risk Management" for an overview of our risk management structure.

**Balance Sheet Limits.** The Firmwide Asset Liability Committee and the Risk Governance Committee have the responsibility of reviewing and approving balance sheet limits. These limits are set at levels which are close to actual operating levels, rather than at levels which reflect our maximum risk appetite, in order to ensure prompt escalation and discussion among our revenue-producing units, Treasury and our independent risk oversight and control functions on a routine basis. The Firmwide Asset Liability Committee and the Risk Governance Committee review and approve balance sheet limits. In addition, the Risk Governance Committee sets aged inventory limits for certain financial instruments as a disincentive to hold inventory over longer periods of time. Requests for changes in limits are evaluated after giving consideration to their impact on our key metrics. Compliance with limits is monitored by our revenue-producing units and Treasury, as well as our independent risk oversight and control functions.

**Monitoring of Key Metrics.** We monitor key balance sheet metrics both by business and on a consolidated basis, including asset and liability size and composition, limit utilization and risk measures. We allocate assets to businesses and review and analyze movements resulting from new business activity, as well as market fluctuations.

**Scenario Analyses.** We conduct various scenario analyses including as part of the Comprehensive Capital Analysis and Review (CCAR) and Dodd-Frank Act Stress Tests (DFAST), as well as our resolution and recovery planning. See "Equity Capital Management and Regulatory Capital — Equity Capital Management" for further information about these scenario analyses. These scenarios cover short-term and long-term time horizons using various macroeconomic and firm-specific assumptions, based on a range of economic scenarios. We use these analyses to assist us in developing our longer-term balance sheet management strategy, including the level and composition of assets, funding and equity capital. Additionally, these analyses help us develop approaches for maintaining appropriate funding, liquidity and capital across a variety of situations, including a severely stressed environment.

### Balance Sheet Allocation

In addition to preparing our consolidated statements of financial condition in accordance with U.S. GAAP, we prepare a balance sheet that generally allocates assets to our businesses, which is a non-GAAP presentation and may not be comparable to similar non-GAAP presentations used by other companies. We believe that presenting our assets on this basis is meaningful because it is consistent with the way management views and manages risks associated with our assets and better enables investors to assess the liquidity of our assets.

The table below presents our balance sheet allocation.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **GCLA, segregated assets and other** | **$313,138** | $285,270 |
| **Secured client financing** | **145,232** | 164,123 |
| Inventory | **204,584** | 216,883 |
| Secured financing agreements | **61,632** | 64,991 |
| Receivables | **42,006** | 36,750 |
| **Institutional Client Services** | **308,222** | 318,624 |
| Public equity | **1,445** | 2,072 |
| Private equity | **19,985** | 20,253 |
| Total equity | **21,430** | 22,325 |
| Loans receivable | **80,590** | 65,933 |
| Loans, at fair value | **13,416** | 14,877 |
| Total loans | **94,006** | 80,810 |
| Debt securities | **11,215** | 8,797 |
| Other | **7,913** | 8,481 |
| **Investing & Lending** | **134,564** | 120,413 |
| **Total inventory and related assets** | **442,786** | 439,037 |
| **Other assets** | **30,640** | 28,346 |
| **Total assets** | **$931,796** | $916,776 |

The following is a description of the captions in the table above:

- **Global Core Liquid Assets (GCLA), Segregated Assets and Other.** We maintain liquidity to meet a broad range of potential cash outflows and collateral needs in a stressed environment. See "Risk Management — Liquidity Risk Management" for information about the composition and sizing of our GCLA. We also segregate cash and securities for regulatory and other purposes related to client activity. Securities are segregated from our own inventory, as well as from collateral obtained through securities borrowed or securities purchased under agreements to resell (resale agreements). In addition, we maintain other unrestricted operating cash balances, primarily for use in specific currencies, entities or jurisdictions where we do not have immediate access to parent company liquidity.

- **Secured Client Financing.** We provide collateralized financing for client positions, including margin loans secured by client collateral, securities borrowed, and resale agreements primarily collateralized by government obligations. Our secured client financing arrangements, which are generally short-term, are accounted for at fair value or at amounts that approximate fair value, and include daily margin requirements to mitigate counterparty credit risk.

- **Institutional Client Services.** We maintain inventory positions to facilitate market making in fixed income, equity, currency and commodity products. Additionally, as part of market-making activities, we enter into resale or securities borrowing arrangements to obtain securities or use our own inventory to cover transactions in which we or our clients have sold securities that have not yet been purchased. The receivables in Institutional Client Services primarily relate to securities transactions.

- **Investing & Lending.** We invest in and originate loans to provide financing to clients. These investments and loans are typically longer-term in nature. We make investments, through our Merchant Banking business and our Special Situations Group, in debt securities, loans and public and private equity. We also originate secured and unsecured loans through our digital platforms. Other Investing & Lending primarily includes customer and other receivables.

***Equity.*** We make equity investments in corporate and real estate entities. As of December 2018, 30% of total equity was in investments made in 2011 or earlier, 23% was in investments made during 2012 through 2014, and 47% was in investments made since the beginning of 2015.

The table below presents equity by type and region.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Equity Type** | | |
| Corporate | **$17,262** | $18,194 |
| Real Estate | **4,168** | 4,131 |
| **Total** | **$21,430** | $22,325 |
| **Region** | | |
| Americas | **53%** | 54% |
| Europe, Middle East and Africa | **16%** | 18% |
| Asia | **31%** | 28% |
| **Total** | **100%** | 100% |

***Loans.*** The table below presents loans by type and region.

| $ in millions | Loans Receivable | Loans, at Fair Value | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| **Loan Type** | | | |
| Corporate loans | **$37,283** | **$ 2,819** | **$40,102** |
| PWM loans | **17,219** | **7,250** | **24,469** |
| Commercial real estate loans | **11,441** | **1,718** | **13,159** |
| Residential real estate loans | **7,284** | **973** | **8,257** |
| Consumer loans | **4,536** | **–** | **4,536** |
| Other loans | **3,893** | **656** | **4,549** |
| Allowance for loan losses | **(1,066)** | **–** | **(1,066)** |
| **Total** | **$80,590** | **$13,416** | **$94,006** |
| **Region** | | | |
| Americas | **67%** | **11%** | **78%** |
| Europe, Middle East and Africa | **16%** | **2%** | **18%** |
| Asia | **3%** | **1%** | **4%** |
| **Total** | **86%** | **14%** | **100%** |
| As of December 2017 | | | |
| **Loan Type** | | | |
| Corporate loans | $30,749 | $ 3,924 | $34,673 |
| PWM loans | 16,591 | 7,102 | 23,693 |
| Commercial real estate loans | 7,987 | 1,825 | 9,812 |
| Residential real estate loans | 6,234 | 1,043 | 7,277 |
| Consumer loans | 1,912 | – | 1,912 |
| Other loans | 3,263 | 983 | 4,246 |
| Allowance for loan losses | (803) | – | (803) |
| Total | $65,933 | $14,877 | $80,810 |
| **Region** | | | |
| Americas | 64% | 13% | 77% |
| Europe, Middle East and Africa | 14% | 4% | 18% |
| Asia | 4% | 1% | 5% |
| Total | 82% | 18% | 100% |

In the table above:

- As of December 2018, corporate loans included $15.50 billion of loans relating to our relationship lending and investment banking activities, $6.99 billion relating to collateralized inventory financing and the remainder of the loans related to other corporate lending activities, including middle market lending. As of December 2017, corporate loans included $11.96 billion of loans relating to our relationship lending and investment banking activities, $5.49 billion relating to collateralized inventory financing and the remainder of the loans related to other corporate lending activities, including middle market lending.
- Approximately 85% of total loans were secured as of both December 2018 and December 2017.
- See Note 9 to the consolidated financial statements for further information about loans receivable.

- **Other Assets.** Other assets are generally less liquid, nonfinancial assets, including property, leasehold improvements and equipment, goodwill and identifiable intangible assets, income tax-related receivables and miscellaneous receivables. Other assets included $13.21 billion as of December 2018 and $9.42 billion as of December 2017, held by consolidated investment entities (CIEs) in connection with our Investing & Lending segment activities. Substantially all of such assets relate to CIEs engaged in real estate investment activities. These entities were funded with liabilities of approximately $6 billion as of December 2018 and $4 billion as of December 2017. Substantially all such liabilities were nonrecourse, thereby reducing our equity at risk.

The table below presents the reconciliation of our balance sheet allocation to our U.S. GAAP balance sheet.

| $ in millions | GCLA, Segregated Assets and Other | Secured Client Financing | Institutional Client Services | Investing & Lending | Total |
|---|---|---|---|---|---|
| **As of December 2018** | | | | | |
| Cash and cash equivalents | **$130,547** | **$ –** | **$ –** | **$ –** | **$130,547** |
| Resale agreements | **87,022** | **32,389** | **19,808** | **39** | **139,258** |
| Securities borrowed | **10,382** | **83,079** | **41,824** | **–** | **135,285** |
| Loans receivable | **–** | **–** | **–** | **80,590** | **80,590** |
| Customer and other receivables | **–** | **29,764** | **42,006** | **7,545** | **79,315** |
| Financial instruments owned | **85,187** | **–** | **204,584** | **46,390** | **336,161** |
| Subtotal | **$313,138** | **$145,232** | **$308,222** | **$134,564** | **$901,156** |
| Other assets | | | | | **30,640** |
| **Total assets** | | | | | **$931,796** |
| As of December 2017 | | | | | |
| Cash and cash equivalents | $110,051 | $ – | $ – | $ – | $110,051 |
| Resale agreements | 73,277 | 26,202 | 20,931 | 412 | 120,822 |
| Securities borrowed | 49,242 | 97,546 | 44,060 | – | 190,848 |
| Loans receivable | – | – | – | 65,933 | 65,933 |
| Customer and other receivables | – | 40,375 | 36,750 | 7,663 | 84,788 |
| Financial instruments owned | 52,700 | – | 216,883 | 46,405 | 315,988 |
| Subtotal | $285,270 | $164,123 | $318,624 | $120,413 | $888,430 |
| Other assets | | | | | 28,346 |
| Total assets | | | | | $916,776 |

In the table above:

- Total assets for Institutional Client Services and Investing & Lending represent inventory and related assets. These amounts differ from total assets by business segment disclosed in Note 25 to the consolidated financial statements because total assets disclosed in Note 25 include allocations of our GCLA, segregated assets and other, secured client financing and other assets.
- See "Balance Sheet Analysis and Metrics" for explanations on the changes in our balance sheet from December 2017 to December 2018.

### Balance Sheet Analysis and Metrics

As of December 2018, total assets in our consolidated statements of financial condition were $931.80 billion, an increase of $15.02 billion from December 2017, reflecting increases in cash and cash equivalents of $20.50 billion, financial instruments owned of $20.17 billion, and loans receivable of $14.66 billion, partially offset by a net decrease in collateralized agreements of $37.13 billion. The increase in cash and cash equivalents reflected the impact of our and clients' activities. The increase in financial instruments owned primarily reflected higher client activity in government and agency obligations, partially offset by lower activity in equity securities by us and our clients. The increase in loans receivable primarily reflected an increase in corporate and commercial real estate loans. The net decrease in collateralized agreements reflected the impact of our and clients' activities.

As of December 2018, total liabilities in our consolidated statements of financial condition were $841.61 billion, an increase of $7.08 billion from December 2017, primarily reflecting increases in deposits of $19.65 billion and unsecured long-term borrowings of $6.46 billion, partially offset by decreases in collateralized financings of $12.34 billion and unsecured short term borrowings of $6.42 billion. The increase in deposits primarily reflected an increase in consumer deposits. The increase in unsecured long-term borrowings was primarily due to net new issuances. The decrease in collateralized financings reflected the impact of our and clients' activities. The decrease in unsecured short term borrowings was primarily due to maturities and early retirements.

Our total repurchase agreements, accounted for as collateralized financings, were $78.72 billion as of December 2018 and $84.72 billion as of December 2017, which were 1% higher as of December 2018 and 2% lower as of December 2017 than the daily average amount of repurchase agreements over the respective quarters, and 12% lower as of December 2018 and 1% lower as of December 2017 than the daily average amount of repurchase agreements over the respective years. As of December 2018, the increase in our repurchase agreements relative to the daily average during the quarter, and decrease in our repurchase agreements relative to the daily average during the year, resulted from client and our activity at the end of the period.

The level of our repurchase agreements fluctuates between and within periods, primarily due to providing clients with access to highly liquid collateral, such as liquid government and agency obligations, through collateralized financing activities.

The table below presents information about the balance sheet and the leverage ratios.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Total assets | **$931,796** | $916,776 |
| Unsecured long-term borrowings | **$224,149** | $217,687 |
| Total shareholders' equity | **$ 90,185** | $ 82,243 |
| Leverage ratio | **10.3x** | 11.1x |
| Debt to equity ratio | **2.5x** | 2.6x |

In the table above:

- The leverage ratio equals total assets divided by total shareholders' equity and measures the proportion of equity and debt we use to finance assets. This ratio is different from the leverage ratios included in Note 20 to the consolidated financial statements.
- The debt to equity ratio equals unsecured long-term borrowings divided by total shareholders' equity.

The table below presents information about shareholders' equity and book value per common share, including the reconciliation of total shareholders' equity to tangible common shareholders' equity.

| | As of December | |
|---|---|---|
| *$ in millions, except per share amounts* | **2018** | 2017 |
| Total shareholders' equity | **$ 90,185** | $ 82,243 |
| Preferred stock | **(11,203)** | (11,853) |
| Common shareholders' equity | **78,982** | 70,390 |
| Goodwill and identifiable intangible assets | **(4,082)** | (4,038) |
| **Tangible common shareholders' equity** | **$ 74,900** | $ 66,352 |
| **Book value per common share** | **$ 207.36** | $ 181.00 |
| **Tangible book value per common share** | **$ 196.64** | $ 170.61 |

In the table above:

- Tangible common shareholders' equity equals total shareholders' equity less preferred stock, goodwill and identifiable intangible assets. We believe that tangible common shareholders' equity is meaningful because it is a measure that we and investors use to assess capital adequacy. Tangible common shareholders' equity is a non-GAAP measure and may not be comparable to similar non-GAAP measures used by other companies.
- Book value per common share and tangible book value per common share are based on common shares outstanding and restricted stock units granted to employees with no future service requirements (collectively, basic shares) of 380.9 million as of December 2018 and 388.9 million as of December 2017. We believe that tangible book value per common share (tangible common shareholders' equity divided by basic shares) is meaningful because it is a measure that we and investors use to assess capital adequacy. Tangible book value per common share is a non-GAAP measure and may not be comparable to similar non-GAAP measures used by other companies.

### Funding Sources

Our primary sources of funding are deposits, collateralized financings, unsecured short-term and long-term borrowings, and shareholders' equity. We seek to maintain broad and diversified funding sources globally across products, programs, markets, currencies and creditors to avoid funding concentrations.

The table below presents information about our funding sources.

| | As of December | | | |
|---|---|---|---|---|
| *$ in millions* | **2018** | | 2017 | |
| Deposits | **$158,257** | **25%** | $138,604 | 23% |
| Collateralized financings: | | | | |
| Repurchase agreements | **78,723** | **13%** | 84,718 | 14% |
| Securities loaned | **11,808** | **2%** | 14,793 | 2% |
| Other secured financings | **21,433** | **3%** | 24,788 | 4% |
| Total collateralized financings | **111,964** | **18%** | 124,299 | 20% |
| Unsecured short-term borrowings | **40,502** | **7%** | 46,922 | 8% |
| Unsecured long-term borrowings | **224,149** | **36%** | 217,687 | 36% |
| Total shareholders' equity | **90,185** | **14%** | 82,243 | 13% |
| **Total funding sources** | **$625,057** | **100%** | $609,755 | 100% |

Our funding is primarily raised in U.S. dollar, Euro, British pound and Japanese yen. We generally distribute our funding products through our own sales force and third-party distributors to a large, diverse creditor base in a variety of markets in the Americas, Europe and Asia. We believe that our relationships with our creditors are critical to our liquidity. Our creditors include banks, governments, securities lenders, corporations, pension funds, insurance companies, mutual funds and individuals. We have imposed various internal guidelines to monitor creditor concentration across our funding programs.

**Deposits.** Our deposits provide us with a diversified source of funding and reduce our reliance on wholesale funding. A growing portion of our deposit base consists of consumer deposits. Deposits are primarily used to finance lending activity, other inventory and a portion of our GCLA. We raise deposits, including savings, demand and time deposits, through internal and third-party broker-dealers, and from consumers and institutional clients, and primarily through Goldman Sachs Bank USA (GS Bank USA) and Goldman Sachs International Bank (GSIB). In September 2018, we launched *Marcus: by Goldman Sachs* in the U.K. to accept deposits. See Note 14 to the consolidated financial statements for further information about our deposits.

**Secured Funding.** We fund a significant amount of inventory on a secured basis. Secured funding includes collateralized financings in the consolidated statements of financial condition. We may also pledge our inventory as collateral for securities borrowed under a securities lending agreement. We also use our own inventory to cover transactions in which we or our clients have sold securities that have not yet been purchased. Secured funding is less sensitive to changes in our credit quality than unsecured funding, due to our posting of collateral to our lenders. Nonetheless, we continually analyze the refinancing risk of our secured funding activities, taking into account trade tenors, maturity profiles, counterparty concentrations, collateral eligibility and counterparty roll over probabilities. We seek to mitigate our refinancing risk by executing term trades with staggered maturities, diversifying counterparties, raising excess secured funding, and pre-funding residual risk through our GCLA.

We seek to raise secured funding with a term appropriate for the liquidity of the assets that are being financed, and we seek longer maturities for secured funding collateralized by asset classes that may be harder to fund on a secured basis, especially during times of market stress. Our secured funding, excluding funding collateralized by liquid government and agency obligations, is primarily executed for tenors of one month or greater and is primarily executed through term repurchase agreements and securities loaned contracts.

The weighted average maturity of our secured funding included in collateralized financings in the consolidated statements of financial condition, excluding funding that can only be collateralized by liquid government and agency obligations, exceeded 120 days as of December 2018.

Assets that may be harder to fund on a secured basis during times of market stress include certain financial instruments in the following categories: mortgage and other asset-backed loans and securities, non-investment-grade corporate debt securities, equity securities and emerging market securities. Assets that are classified in level 3 of the fair value hierarchy are generally funded on an unsecured basis. See Notes 5 and 6 to the consolidated financial statements for further information about the classification of financial instruments in the fair value hierarchy and "Unsecured Long-Term Borrowings" below for further information about the use of unsecured long-term borrowings as a source of funding.

We also raise financing through other types of collateralized financings, such as secured loans and notes. GS Bank USA has access to funding from the Federal Home Loan Bank. Our outstanding borrowings against the Federal Home Loan Bank were $528 million as of December 2018 and $3.40 billion as of December 2017.

GS Bank USA also has access to funding through the Federal Reserve Bank discount window. While we do not rely on this funding in our liquidity planning and stress testing, we maintain policies and procedures necessary to access this funding and test discount window borrowing procedures.

**Unsecured Short-Term Borrowings.** A significant portion of our unsecured short-term borrowings was originally long-term debt that is scheduled to mature within one year of the reporting date. We use unsecured short-term borrowings, including U.S. and non-U.S. hybrid financial instruments, to finance liquid assets and for other cash management purposes. In light of regulatory developments, Group Inc. no longer issues debt with an original maturity of less than one year, other than to its subsidiaries. See Note 15 to the consolidated financial statements for further information about our unsecured short-term borrowings.

**Unsecured Long-Term Borrowings.** We issue unsecured long-term borrowings as a source of funding for inventory and other assets and to finance a portion of our GCLA. Unsecured long-term borrowings, including structured notes, are raised through syndicated U.S. registered offerings, U.S. registered and Rule 144A medium-term note programs, offshore medium-term note offerings and other debt offerings. We issue in different tenors, currencies and products to maximize the diversification of our investor base.

The table below presents the quarterly unsecured long-term borrowings maturity profile as of December 2018.

| *$ in millions* | First Quarter | Second Quarter | Third Quarter | Fourth Quarter | Total |
|---|---|---|---|---|---|
| 2020 | **$ 6,740** | **$9,744** | **$6,308** | **$6,579** | **$ 29,371** |
| 2021 | **$ 3,288** | **$4,162** | **$7,790** | **$7,724** | **22,964** |
| 2022 | **$ 6,151** | **$6,067** | **$5,365** | **$5,876** | **23,459** |
| 2023 | **$10,076** | **$4,958** | **$8,343** | **$4,495** | **27,872** |
| 2024 - thereafter | | | | | **120,483** |
| **Total** | | | | | **$224,149** |

The weighted average maturity of our unsecured long-term borrowings as of December 2018 was approximately eight years. To mitigate refinancing risk, we seek to limit the principal amount of debt maturing over the course of any monthly, quarterly or annual time horizon. We enter into interest rate swaps to convert a portion of our unsecured long-term borrowings into floating-rate obligations to manage our exposure to interest rates. See Note 16 to the consolidated financial statements for further information about our unsecured long-term borrowings.

**Shareholders' Equity.** Shareholders' equity is a stable and perpetual source of funding. See Note 19 to the consolidated financial statements for further information about our shareholders' equity.

## Equity Capital Management and Regulatory Capital

Capital adequacy is of critical importance to us. We have in place a comprehensive capital management policy that provides a framework, defines objectives and establishes guidelines to assist us in maintaining the appropriate level and composition of capital in both business-as-usual and stressed conditions.

### Equity Capital Management

We determine the appropriate amount and composition of our equity capital by considering multiple factors, including our current and future regulatory capital requirements, the results of our capital planning and stress testing process, the results of resolution capital models and other factors, such as rating agency guidelines, subsidiary capital requirements, the business environment and conditions in the financial markets.

We manage our capital requirements and the levels of our capital usage principally by setting limits on balance sheet assets and/or limits on risk, in each case at both the firmwide and business levels.

We principally manage the level and composition of our equity capital through issuances and repurchases of our common stock. We may also, from time to time, issue or repurchase our preferred stock, junior subordinated debt issued to trusts, and other subordinated debt or other forms of capital as business conditions warrant. Prior to any repurchases, we must receive confirmation that the Board of Governors of the Federal Reserve System (FRB) does not object to such capital action. See Notes 16 and 19 to the consolidated financial statements for further information about our preferred stock, junior subordinated debt issued to trusts and other subordinated debt.

**Capital Planning and Stress Testing Process.** As part of capital planning, we project sources and uses of capital given a range of business environments, including stressed conditions. Our stress testing process is designed to identify and measure material risks associated with our business activities, including market risk, credit risk and operational risk, as well as our ability to generate revenues.

The following is a description of our capital planning and stress testing process:

- **Capital Planning.** Our capital planning process incorporates an internal capital adequacy assessment with the objective of ensuring that we are appropriately capitalized relative to the risks in our businesses. We incorporate stress scenarios into our capital planning process with a goal of holding sufficient capital to ensure we remain adequately capitalized after experiencing a severe stress event. Our assessment of capital adequacy is viewed in tandem with our assessment of liquidity adequacy and is integrated into our overall risk management structure, governance and policy framework.

  Our capital planning process also includes an internal risk-based capital assessment. This assessment incorporates market risk, credit risk and operational risk. Market risk is calculated by using Value-at-Risk (VaR) calculations supplemented by risk-based add-ons which include risks related to rare events (tail risks). Credit risk utilizes assumptions about our counterparties' probability of default and the size of our losses in the event of a default. Operational risk is calculated based on scenarios incorporating multiple types of operational failures, as well as considering internal and external actual loss experience. Backtesting for market risk and credit risk is used to gauge the effectiveness of models at capturing and measuring relevant risks.

- **Stress Testing.** Our stress tests incorporate our internally designed stress scenarios, including our internally developed severely adverse scenario, and those required under CCAR and DFAST, and are designed to capture our specific vulnerabilities and risks. We provide further information about our stress test processes and a summary of the results on our website as described in "Business — Available Information" in Part I, Item 1 of this Form 10-K.

As required by the FRB's annual CCAR rules, we submit a capital plan for review by the FRB. The purpose of the FRB's review is to ensure that we have a robust, forward-looking capital planning process that accounts for our unique risks and that permits continued operation during times of economic and financial stress.

The FRB evaluates us based, in part, on whether we have the capital necessary to continue operating under the baseline and stress scenarios provided by the FRB and those developed internally. This evaluation also takes into account our process for identifying risk, our controls and governance for capital planning, and our guidelines for making capital planning decisions. In addition, the FRB evaluates our plan to make capital distributions (i.e., dividend payments and repurchases or redemptions of stock, subordinated debt or other capital securities) and issue capital, across the range of macroeconomic scenarios and firm-specific assumptions.

In addition, the DFAST rules currently require us to conduct stress tests on a semi-annual basis and publish a summary of results. The FRB also conducts its own annual stress tests and publishes a summary of certain results.

With respect to our 2018 CCAR submission, the FRB informed us that it did not object to our capital plan, conditioned upon us returning not more than \$6.30 billion of capital from the third quarter of 2018 through the second quarter of 2019. The capital plan provides for up to \$5.00 billion in repurchases of outstanding common stock and \$1.30 billion in total common stock dividends, including an increase in our common stock dividend of \$0.05 from \$0.80 to \$0.85 per share in the second quarter of 2019, subject to the approval by the Board of Directors of Group Inc. (Board). The amount and timing of our capital actions will be based on, among other things, our current and projected capital position, and capital deployment opportunities. We published a summary of our annual DFAST results in June 2018. See "Business — Available Information" in Part I, Item 1 of this Form 10-K.

In October 2018, we submitted our semi-annual DFAST results to the FRB and published a summary of the results of our internally developed severely adverse scenario. See "Business — Available Information" in Part I, Item 1 of this Form 10-K.

In addition, GS Bank USA submitted its 2018 annual DFAST results to the FRB in April 2018 and published a summary of its annual DFAST results in June 2018. GS Bank USA will not be required to conduct the annual company-run stress test in 2019. See "Business — Available Information" in Part I, Item 1 of this Form 10-K.

Goldman Sachs International (GSI) and GSIB also have their own capital planning and stress testing process, which incorporates internally designed stress tests and those required under the Prudential Regulation Authority's (PRA) Internal Capital Adequacy Assessment Process.

**Contingency Capital Plan.** As part of our comprehensive capital management policy, we maintain a contingency capital plan. Our contingency capital plan provides a framework for analyzing and responding to a perceived or actual capital deficiency, including, but not limited to, identification of drivers of a capital deficiency, as well as mitigants and potential actions. It outlines the appropriate communication procedures to follow during a crisis period, including internal dissemination of information, as well as timely communication with external stakeholders.

**Capital Attribution.** We assess each of our businesses' capital usage based upon our internal assessment of risks, which incorporates an attribution of all of our relevant regulatory capital requirements. These regulatory capital requirements are allocated using our attributed equity framework, which takes into consideration our most binding capital constraints. Our most binding capital constraint is based on the results of the FRB's annual stress test scenarios which include the Standardized risk-based capital and leverage ratios.

We also attribute risk-weighted assets (RWAs) to our business segments. As of December 2018, approximately 60% of RWAs calculated in accordance with the Standardized Capital Rules and approximately 50% of RWAs calculated in accordance with the Basel III Advanced Rules, were attributed to our Institutional Client Services segment and substantially all of the remaining RWAs were attributed to our Investing & Lending segment. We manage the levels of our capital usage based upon balance sheet and risk limits, as well as capital return analyses of our businesses based on our capital attribution.

**Share Repurchase Program.** We use our share repurchase program to help maintain the appropriate level of common equity. The repurchase program is effected primarily through regular open-market purchases (which may include repurchase plans designed to comply with Rule 10b5-1), the amounts and timing of which are determined primarily by our current and projected capital position and our capital plan submitted to the FRB as part of CCAR. The amounts and timing of the repurchases may also be influenced by general market conditions and the prevailing price and trading volumes of our common stock.

As of December 2018, the remaining share authorization under our existing repurchase program was 33.7 million shares; however, we are only permitted to make repurchases to the extent that such repurchases have not been objected to by the FRB. See "Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities" in Part II, Item 5 of this Form 10-K and Note 19 to the consolidated financial statements for further information about our share repurchase program, and see above for information about our capital planning and stress testing process.

**Resolution Capital Models.** In connection with our resolution planning efforts, we have established a Resolution Capital Adequacy and Positioning framework, which is designed to ensure that our major subsidiaries (GS Bank USA, Goldman Sachs & Co. LLC (GS&Co.), GSI, GSIB, Goldman Sachs Japan Co., Ltd. (GSJCL), Goldman Sachs Asset Management, L.P. and Goldman Sachs Asset Management International (GSAMI)) have access to sufficient loss-absorbing capacity (in the form of equity, subordinated debt and unsecured senior debt) so that they are able to wind-down following a Group Inc. bankruptcy filing in accordance with our preferred resolution strategy.

In addition, we have established a triggers and alerts framework, which is designed to provide the Board with information needed to make an informed decision on whether and when to commence bankruptcy proceedings for Group Inc.

### Rating Agency Guidelines

The credit rating agencies assign credit ratings to the obligations of Group Inc., which directly issues or guarantees substantially all of our senior unsecured debt obligations. GS&Co. and GSI have been assigned long- and short-term issuer ratings by certain credit rating agencies. GS Bank USA and GSIB have also been assigned long- and short-term issuer ratings, as well as ratings on their long- and short-term bank deposits. In addition, credit rating agencies have assigned ratings to debt obligations of certain other subsidiaries of Group Inc.

The level and composition of our equity capital are among the many factors considered in determining our credit ratings. Each agency has its own definition of eligible capital and methodology for evaluating capital adequacy, and assessments are generally based on a combination of factors rather than a single calculation. See "Risk Management — Liquidity Risk Management — Credit Ratings" for further information about credit ratings of Group Inc., GS Bank USA, GSIB, GS&Co. and GSI.

### Consolidated Regulatory Capital

We are subject to consolidated regulatory capital requirements which are calculated in accordance with the regulations of the FRB (Capital Framework). Under the Capital Framework, we are an "Advanced approach" banking organization and have been designated as a global systemically important bank (G-SIB).

The Capital Framework includes risk-based capital buffers that phased in ratably and became fully effective on January 1, 2019. The minimum risk-based capital ratios applicable to us as of January 2019 reflected the fully phased-in capital conservation buffer of 2.5% and the countercyclical capital buffer, if any, determined by the FRB. In addition, the fully phased-in G-SIB buffer applicable to us as of January 2019 is 2.5% based on 2017 financial data. The G-SIB buffer applicable to us as of January 2020 is 2.5% based on 2018 financial data. The G-SIB and countercyclical buffers in the future may differ due to additional guidance from our regulators and/or positional changes.

See Note 20 to the consolidated financial statements for further information about our risk-based capital ratios and leverage ratios, and the Capital Framework.

### Subsidiary Capital Requirements

Many of our subsidiaries, including our bank and broker-dealer subsidiaries, are subject to separate regulation and capital requirements of the jurisdictions in which they operate.

**Bank Subsidiaries.** GS Bank USA is our primary U.S. banking subsidiary and GSIB is our primary non-U.S. banking subsidiary. These entities are subject to regulatory capital requirements.

See Note 20 to the consolidated financial statements for further information about the regulatory capital requirements of our bank subsidiaries.

**U.S. Regulated Broker-Dealer Subsidiaries.** GS&Co. is our primary U.S. regulated broker-dealer subsidiary and is subject to regulatory capital requirements, including those imposed by the SEC and the Financial Industry Regulatory Authority, Inc. In addition, GS&Co. is a registered futures commission merchant and is subject to regulatory capital requirements imposed by the CFTC, the Chicago Mercantile Exchange and the National Futures Association. Rule 15c3-1 of the SEC and Rule 1.17 of the CFTC specify uniform minimum net capital requirements, as defined, for their registrants, and also effectively require that a significant part of the registrants' assets be kept in relatively liquid form. GS&Co. has elected to calculate its minimum capital requirements in accordance with the "Alternative Net Capital Requirement" as permitted by Rule 15c3-1.

GS&Co. had regulatory net capital, as defined by Rule 15c3-1, of $17.45 billion as of December 2018 and $15.57 billion as of December 2017, which exceeded the amount required by $15.00 billion as of December 2018 and $13.15 billion as of December 2017. In addition to its alternative minimum net capital requirements, GS&Co. is also required to hold tentative net capital in excess of $1 billion and net capital in excess of $500 million in accordance with the market and credit risk standards of Appendix E of Rule 15c3-1. GS&Co. is also required to notify the SEC in the event that its tentative net capital is less than $5 billion. As of both December 2018 and December 2017, GS&Co. had tentative net capital and net capital in excess of both the minimum and the notification requirements.

**Non-U.S. Regulated Broker-Dealer Subsidiaries.** Our principal non-U.S. regulated broker-dealer subsidiaries include GSI and GSJCL.

GSI, our U.K. broker-dealer, is regulated by the PRA and the Financial Conduct Authority (FCA). GSI is subject to the capital framework for E.U.-regulated financial institutions prescribed in the E.U. Fourth Capital Requirements Directive and the E.U. Capital Requirements Regulation (CRR). These capital regulations are largely based on Basel III.

The table below presents information about GSI's risk-based capital ratios and minimum ratios.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Risk-based capital and RWAs** | | |
| CET1 | **$ 23,956** | $ 24,871 |
| Tier 1 capital | **$ 32,256** | $ 30,671 |
| Tier 2 capital | **$ 5,377** | $ 5,377 |
| Total capital | **$ 37,633** | $ 36,048 |
| RWAs | **$200,089** | $225,942 |
| **Risk-based capital ratios** | | |
| CET1 ratio | **12.0%** | 11.0% |
| Tier 1 capital ratio | **16.1%** | 13.6% |
| Total capital ratio | **18.8%** | 16.0% |
| **Risk-based minimum ratios** | | |
| CET1 ratio | **8.1%** | 7.2% |
| Tier 1 capital ratio | **10.1%** | 9.1% |
| Total capital ratio | **12.7%** | 11.8% |

In the table above:

- CET1, Tier 1 capital and Total capital as of December 2018 included amounts which will be finalized upon the issuance of GSI's 2018 annual audited financial statements and contributed approximately 114 basis points to the risk-based capital ratios.
- The minimum risk-based capital ratios incorporate capital guidance received from the PRA and could change in the future. GSI's future capital requirements may also be impacted by developments such as the introduction of risk-based capital buffers.

In November 2016, the European Commission proposed amendments to the CRR to implement a 3% minimum leverage ratio requirement for certain E.U. financial institutions. This leverage ratio compares the CRR's definition of Tier 1 capital to a measure of leverage exposure, defined as the sum of certain assets plus certain off-balance-sheet exposures (which include a measure of derivatives, securities financing transactions, commitments and guarantees), less Tier 1 capital deductions. Any required minimum leverage ratio is expected to become effective for GSI no earlier than January 1, 2021. GSI had a leverage ratio of 4.4% as of December 2018 and 4.1% as of December 2017. Tier 1 capital as of December 2018 included amounts which will be finalized upon the issuance of GSI's 2018 annual audited financial statements and these amounts contributed approximately 31 basis points to the leverage ratio. This leverage ratio is based on our current interpretation and understanding of this rule and may evolve as we discuss the interpretation and application of this rule with GSI's regulators.

GSJCL, our Japanese broker-dealer, is regulated by Japan's Financial Services Agency. GSJCL and certain other non-U.S. subsidiaries are also subject to capital adequacy requirements promulgated by authorities of the countries in which they operate. As of both December 2018 and December 2017, these subsidiaries were in compliance with their local capital adequacy requirements.

## Regulatory Matters and Other Developments

### Regulatory Matters

Our businesses are subject to significant and evolving regulation. The Dodd-Frank Act, enacted in July 2010, significantly altered the financial regulatory regime within which we operate. In addition, other reforms have been adopted or are being considered by regulators and policy makers worldwide. Given that many of the new and proposed rules are highly complex, the full impact of regulatory reform will not be known until the rules are implemented and market practices develop under the final regulations.

See "Business — Regulation" in Part I, Item 1 of this Form 10-K for further information about the laws, rules and regulations and proposed laws, rules and regulations that apply to us and our operations.

**Resolution and Recovery Plans.** We are required by the FRB and the FDIC to submit a periodic plan that describes our strategy for a rapid and orderly resolution in the event of material financial distress or failure (resolution plan). We are also required by the FRB to submit a periodic recovery plan that outlines the steps that management could take to reduce risk, maintain sufficient liquidity, and conserve capital in times of prolonged stress.

In December 2017, the FRB and the FDIC provided feedback on our 2017 resolution plan and determined that it satisfactorily addressed the shortcomings identified in our prior submissions. The FRB and the FDIC did not identify deficiencies in our 2017 resolution plan, but the FRB and the FDIC did note one shortcoming that must be addressed in our next resolution plan submission. Our next resolution plan is due on July 1, 2019. In December 2018, the FRB and FDIC finalized guidance for Resolution Plan submissions which consolidated or superseded all prior guidance. See "Business — Available Information" in Part I, Item 1 of this Form 10-K.

In addition, GS Bank USA is required to submit periodic resolution plans to the FDIC. GS Bank USA's 2018 resolution plan was submitted on June 28, 2018. In August 2018, the FDIC extended the next resolution plan filing deadline to no sooner than July 1, 2020.

**TLAC.** In December 2016, the FRB adopted a final rule, establishing new TLAC and related requirements for U.S. BHCs designated as G-SIBs. The rule became effective in January 2019, with no phase-in period. Failure to comply with the TLAC requirements could result in restrictions being imposed by the FRB and could limit our ability to distribute capital, including share repurchases and dividend payments, and to make certain discretionary compensation payments.

The table below presents information about our TLAC and external long-term debt ratios.

| *$ in millions* | TLAC and External Long-Term Debt |
|---|---|
| **As of December 2018** | |
| TLAC | $ 254,836 |
| External long-term debt | $ 160,493 |
| RWAs | $ 558,111 |
| Leverage exposure | $1,342,906 |
| TLAC to RWAs | 45.7% |
| TLAC to leverage exposure | 19.0% |
| External long-term debt to RWAs | 28.8% |
| External long-term debt to leverage exposure | 12.0% |
| **As of January 2019** | |
| Minimum TLAC to RWAs | 22.0% |
| Minimum TLAC to leverage exposure | 9.5% |
| Minimum external long-term debt to RWAs | 8.5% |
| Minimum external long-term debt to leverage exposure | 4.5% |

In the table above:

- TLAC includes common and preferred stock, and eligible long-term debt issued by Group Inc. Eligible long-term debt represents unsecured debt, which has a remaining maturity of at least one year and satisfies additional requirements.
- External long-term debt consists of eligible long-term debt subject to a haircut if it is due to be paid between one and two years.
- RWAs represent Basel III Advanced RWAs. In accordance with the TLAC rules, the higher of Basel III Advanced or Standardized RWAs are used in the calculation of TLAC and external long-term debt ratios.
- Leverage exposure consists of average adjusted total assets and certain off-balance-sheet exposures.

See "Business — Regulation" in Part I, Item 1 of this Form 10-K for further information about TLAC.

### Other Developments

**Brexit.** In March 2017, the U.K. government commenced the formal proceedings to end the U.K.'s membership in the E.U. There is a two year window during which the terms of the U.K.'s exit from the E.U. may be negotiated. This period expires on March 29, 2019.

The E.U. and the U.K. had negotiated a withdrawal agreement which both the U.K. and the E.U. Parliaments must ratify (the Withdrawal Agreement). The U.K. Parliament has not yet approved the Withdrawal Agreement. As a result, there is a possibility that the U.K. will leave the E.U. on March 29, 2019 without any transitional arrangements in place and firms based in the U.K. will lose their existing access arrangements to the E.U. markets; such a scenario is referred to as a "hard" Brexit.

We have been preparing for anticipated outcomes, including a hard Brexit, with the goal of ensuring that we maintain access to E.U. markets and are able to continue to provide products and services to our E.U. clients. In order for us to continue to serve our E.U. clients, clients may need to face an entity within one of the remaining E.U. member states, unless national laws in the applicable member state permit cross-border services from non-E.U. entities (for example, based on specific licenses or exemptions).

Our plan to manage a hard Brexit scenario involves transition of certain activities to new and/or different legal entities; working with clients and counterparties to redocument transactions so they face one of our E.U. legal entities; changes to our infrastructure; obtaining and developing new real estate; and, in some cases, moving our people to offices in the E.U.

In a hard Brexit scenario or as otherwise necessary, our plan is to service our E.U. client base in the following manner:

- Our German bank subsidiary, Goldman Sachs Bank Europe SE (GSBE), will act as our main operating subsidiary in the E.U. and will assume certain functions that can no longer be efficiently and effectively performed by our U.K. operating subsidiaries, including GSI, GSIB and GSAMI.
- Consistent with our global approach of being closer to our clients, we are also setting up branches of GSBE in a number of jurisdictions in the E.U. to enable Investment Banking, Institutional Client Services and PWM investment personnel to be situated in our offices in those countries.
- We have received approval from the German financial regulator, BaFin, for a licensed investment firm, Goldman Sachs Europe SE, which will be able to conduct certain activities (such as activities related to physical commodities and related products) that GSBE may be prevented from undertaking.
- In order to service our Investment Management business, we have received approval from the Irish Financial Regulator, the Central Bank of Ireland, for a Collective Investment Fund and Alternative Investment Fund Manager in Ireland, to replace the similar existing London-based Alternative Investment Fund Manager, which will lose its E.U. passport post-Brexit.
- A large portion of our Institutional Client Services and Investment Banking clients are classified as professionals or eligible counterparties in specific jurisdictions and may choose to continue being serviced by, and to continue to transact with, the U.K. service providers and entities under domestic arrangements provided by individual member states (licenses or exemptions). We expect to continue providing products and services in this manner to the extent that clients prefer such coverage and it is available. This would mean those clients who choose to do so in certain jurisdictions could continue to face GSI.
- We are also in the process of opening accounts to enable clients to transact with GSBE and/or Goldman Sachs Europe SE, as applicable.
- The internal infrastructure build-out and external connectivity to Financial Market Infrastructure required for the new E.U. entities continues to progress, with substantial elements already in place. GSBE has connected to settlement and clearing systems and is testing exchange connectivity.

- GSBE has been assigned a credit rating of A/F1 by Fitch, Inc. (Fitch), A1/P-1 by Moody's Investors Service (Moody's) and A+/A-1 by Standard & Poor's Ratings Services (S&P), which are consistent with those issued to GSI.
- Headcount in our E.U. offices has increased over the course of last year, with several hundred roles expected to transition into the E.U. under our current planning assumptions.
- We have secured and are developing additional real estate capacity in Frankfurt, Stockholm, Milan and Dublin.

**Replacement of Interbank Offered Rates (IBORs), including LIBOR.** Central banks and regulators in a number of major jurisdictions (for example, U.S., U.K., E.U., Switzerland and Japan) have convened working groups to find, and implement the transition to, suitable replacements for IBORs. The U.K. FCA, which regulates LIBOR, has announced that it will not compel panel banks to contribute to LIBOR after 2021. The E.U. Benchmarks Regulation imposed conditions under which only compliant benchmarks may be used in new contracts after 2021.

Market-led working groups in major jurisdictions, noted above, have already selected their preferred alternative risk-free reference rates and have published and will continue to publish consultations on issues, including methodologies for fallback provisions in contracts and financial instruments linked to IBORs and the development of term structures for alternative risk-free reference rates, which will be critical for financial markets to transition to the use of alternative risk-free reference rates in place of IBORs.

We have exposure to IBORs, including in financial instruments and contracts that mature after 2021. Our exposures arise from securities and loans we hold for investment or in connection with market-making activities, as well as derivatives we enter into to make markets for our clients and hedge our risks. We also have exposure to IBORs in the floating-rate securities and other funding products we issue.

The markets for alternative risk-free reference rates are developing and as they develop we expect to transition to these alternative risk-free reference rates.

We are seeking to facilitate an orderly transition from IBORs to alternative risk-free reference rates for us and our clients. Accordingly, we have created a program that focuses on:

- Evaluating and monitoring the impacts across our businesses, including transactions and products;
- Identifying and evaluating the scope of existing financial instruments and contracts that may be affected, and the extent to which those financial instruments and contracts already contain appropriate fallback language or would require amendment, either through bilateral negotiation or using industry-wide tools, such as protocols;
- Enhancements to infrastructure (for example, models and systems) to prepare for a smooth transition to alternative risk-free reference rates;
- Active participation in central bank and sector working groups, including responding to industry consultations; and
- Client education and communication.

As part of this program, we have sought to systematically identify the risks inherent in this transition, including financial risks (for example, earnings volatility under stress due to widening swap spreads and the loss of funding sources as a result of counterparties' reluctance to participate in transitioning their positions) and nonfinancial risks (for example, the inability to negotiate fallbacks with clients and/or counterparties and operational impediments to the transition). We are engaged with a range of industry and regulatory working groups (for example, ISDA, the Bank of England's Working Group on Sterling Risk Free Reference Rates and the Federal Reserve's Alternative Reference Rates Committee) and will continue to engage with our clients and counterparties to facilitate an orderly transition to alternative risk-free reference rates.

## Off-Balance-Sheet Arrangements and Contractual Obligations

### Off-Balance-Sheet Arrangements

In the ordinary course of business, we enter into various types of off-balance-sheet arrangements. Our involvement in these arrangements can take many different forms, including:

- Purchasing or retaining residual and other interests in special purpose entities such as mortgage-backed and other asset-backed securitization vehicles;
- Holding senior and subordinated debt, interests in limited and general partnerships, and preferred and common stock in other nonconsolidated vehicles;
- Entering into interest rate, foreign currency, equity, commodity and credit derivatives, including total return swaps;
- Entering into operating leases; and
- Providing guarantees, indemnifications, commitments, letters of credit and representations and warranties.

We enter into these arrangements for a variety of business purposes, including securitizations. The securitization vehicles that purchase mortgages, corporate bonds, and other types of financial assets are critical to the functioning of several significant investor markets, including the mortgage-backed and other asset-backed securities markets, since they offer investors access to specific cash flows and risks created through the securitization process.

We also enter into these arrangements to underwrite client securitization transactions; provide secondary market liquidity; make investments in performing and nonperforming debt, distressed loans, power-related assets, equity securities, real estate and other assets; provide investors with credit-linked and asset-repackaged notes; and receive or provide letters of credit to satisfy margin requirements and to facilitate the clearance and settlement process.

The table below presents where information about various off-balance-sheet arrangements may be found in this Form 10-K. In addition, see Note 3 to the consolidated financial statements for information about our consolidation policies.

| Type of Off-Balance-Sheet Arrangement | Disclosure in Form 10-K |
|---|---|
| Variable interests and other obligations, including contingent obligations, arising from variable interests in nonconsolidated variable interest entities (VIEs) | See Note 12 to the consolidated financial statements. |
| Leases | See "Contractual Obligations" and Note 18 to the consolidated financial statements. |
| Guarantees, letters of credit, and lending and other commitments | See Note 18 to the consolidated financial statements. |
| Derivatives | See "Risk Management — Credit Risk Management — Credit Exposures — OTC Derivatives" and Notes 4, 5, 7 and 18 to the consolidated financial statements. |

## Contractual Obligations

We have certain contractual obligations which require us to make future cash payments. These contractual obligations include our time deposits, secured long-term financings, unsecured long-term borrowings, contractual interest payments and minimum rental payments under noncancelable leases.

Our obligations to make future cash payments also include our commitments and guarantees related to off-balance-sheet arrangements, which are excluded from the table below. See Note 18 to the consolidated financial statements for further information about such commitments and guarantees.

Due to the uncertainty of the timing and amounts that will ultimately be paid, our liability for unrecognized tax benefits has been excluded from the table below. See Note 24 to the consolidated financial statements for further information about our unrecognized tax benefits.

The table below presents contractual obligations by type.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Time deposits | **$ 28,413** | $ 30,075 |
| Secured long-term financings | **$ 11,878** | $ 9,892 |
| Unsecured long-term borrowings | **$224,149** | $217,687 |
| Contractual interest payments | **$ 54,594** | $ 54,489 |
| Minimum rental payments | **$ 2,399** | $ 1,964 |

The table below presents contractual obligations by expiration.

| | **As of December 2018** | | | |
|---|---|---|---|---|
| *$ in millions* | **2019** | **2020 - 2021** | **2022 - 2023** | **2024 - Thereafter** |
| Time deposits | **$ –** | **$13,822** | **$ 9,828** | **$ 4,763** |
| Secured long-term financings | **$ –** | **$ 5,711** | **$ 3,163** | **$ 3,004** |
| Unsecured long-term borrowings | **$ –** | **$52,335** | **$ 51,331** | **$120,483** |
| Contractual interest payments | **$6,695** | **$12,015** | **$ 8,568** | **$ 27,316** |
| Minimum rental payments | **$ 281** | **$ 489** | **$ 319** | **$ 1,310** |

In the table above:

- Obligations maturing within one year of our financial statement date or redeemable within one year of our financial statement date at the option of the holders are excluded as they are treated as short-term obligations. See Note 15 to the consolidated financial statements for further information about our short-term borrowings.
- Obligations that are repayable prior to maturity at our option are reflected at their contractual maturity dates and obligations that are redeemable prior to maturity at the option of the holders are reflected at the earliest dates such options become exercisable.
- As of December 2018, unsecured long-term borrowings had maturities extending through 2067, consisted principally of senior borrowings, and included $4.24 billion of adjustments to the carrying value of certain unsecured long-term borrowings resulting from the application of hedge accounting. See Note 16 to the consolidated financial statements for further information about our unsecured long-term borrowings.
- As of December 2018, the difference between the aggregate contractual principal amount and the related fair value of long-term other secured financings for which the fair value option was elected was not material.
- As of December 2018, the aggregate contractual principal amount of unsecured long-term borrowings for which the fair value option was elected exceeded the related fair value by $2.38 billion.

- Contractual interest payments represents estimated future interest payments related to unsecured long-term borrowings, secured long-term financings and time deposits based on applicable interest rates as of December 2018, and includes stated coupons, if any, on structured notes.
- Future minimum rental payments are net of minimum sublease rentals under noncancelable leases. These lease commitments for office space expire on various dates through 2069. Certain agreements are subject to periodic escalation provisions for increases in real estate taxes and other charges. See Note 18 to the consolidated financial statements for further information about our leases.

## Risk Management

Risks are inherent in our businesses and include liquidity, market, credit, operational, model, legal, compliance, conduct, regulatory and reputational risks. For further information about our risk management processes, see "Overview and Structure of Risk Management." Our risks include the risks across our risk categories, regions or global businesses, as well as those which have uncertain outcomes and have the potential to materially impact our financial results, our liquidity and our reputation. For further information about our areas of risk, see "Liquidity Risk Management," "Market Risk Management," "Credit Risk Management," "Operational Risk Management" and "Model Risk Management" and "Risk Factors" in Part I, Item 1A of this Form 10-K.

## Overview and Structure of Risk Management

### Overview

We believe that effective risk management is critical to our success. Accordingly, we have established an enterprise risk management framework that employs a comprehensive, integrated approach to risk management, and is designed to enable comprehensive risk management processes through which we identify, assess, monitor and manage the risks we assume in conducting our activities. These risks include liquidity, market, credit, operational, model, legal, compliance, conduct, regulatory and reputational risk exposures. Our risk management structure is built around three core components: governance, processes and people.

**Governance.** Risk management governance starts with the Board, which both directly and through its committees, including its Risk Committee, oversees our risk management policies and practices implemented through the enterprise risk management framework. The Board is also responsible for the annual review and approval of our risk appetite statement. The risk appetite statement describes the levels and types of risk we are willing to accept or to avoid, in order to achieve our strategic business objectives, while remaining in compliance with regulatory requirements.

The Board receives regular briefings on firmwide risks, including liquidity risk, market risk, credit risk, operational risk and model risk from our independent risk oversight and control functions, including the chief risk officer, and on compliance risk and conduct risk from the head of Compliance, on legal and regulatory matters from the general counsel, and on other matters impacting our reputation from the chair of our Firmwide Client and Business Standards Committee and our Firmwide Reputational Risk Committee. The chief risk officer reports to our chief executive officer and to the Risk Committee of the Board. As part of the review of the firmwide risk portfolio, the chief risk officer regularly advises the Risk Committee of the Board of relevant risk metrics and material exposures, including risk limits and thresholds established in our risk appetite statement.

The Enterprise Risk Management department, which reports to our chief risk officer, oversees the implementation of our risk governance structure and core risk management processes and is responsible for ensuring that our enterprise risk management framework provides the Board, our risk committees and senior management with a consistent and integrated approach to managing our various risks in a manner consistent with our risk appetite.

Our revenue-producing units, as well as Treasury, Operations and Technology, are our first line of defense and are accountable for the outcomes of our risk-generating activities, as well as for assessing and managing those risks within our risk appetite.

Our independent risk oversight and control functions are considered our second line of defense and provide independent assessment, oversight and challenge of the risks taken by our first line of defense, as well as lead and participate in risk-oriented committees. Independent risk oversight and control functions include Compliance, Conflicts Resolution, Controllers, Credit Risk Management, Enterprise Risk Management, Human Capital Management, Legal, Liquidity Risk Management, Market Risk Management, Model Risk Management, Operational Risk Management and Tax.

Internal Audit is considered our third line of defense and reports to our chief executive officer and the Audit Committee of the Board. Internal Audit includes professionals with a broad range of audit and industry experience, including risk management expertise. Internal Audit is responsible for independently assessing and validating the effectiveness of key controls, including those within the risk management framework, and providing timely reporting to the Audit Committee of the Board, senior management and regulators.

The three lines of defense structure promotes the accountability of first line risk takers, provides a framework for effective challenge by the second line and empowers independent review from the third line.

Our governance structure provides the protocol and responsibility for decision-making on risk management issues and ensures implementation of those decisions. We make extensive use of risk-related committees that meet regularly and serve as an important means to facilitate and foster ongoing discussions to manage and mitigate risks.

We maintain strong communication about risk and we have a culture of collaboration in decision-making among our first and second lines of defense, committees and senior management. While our first line of defense is responsible for management of their risk, we dedicate extensive resources to our second line of defense in order to ensure a strong oversight structure and an appropriate segregation of duties. We regularly reinforce our strong culture of escalation and accountability across all functions.

**Processes.** We maintain various processes that are critical components of our risk management framework, including identifying, assessing, monitoring and limiting our risks.

To effectively assess and monitor our risks, we maintain a daily discipline of marking substantially all of our inventory to current market levels. We carry our inventory at fair value, with changes in valuation reflected immediately in our risk management systems and in net revenues. We do so because we believe this discipline is one of the most effective tools for assessing and managing risk and that it provides transparent and realistic insight into our inventory exposures.

We also apply a rigorous framework of limits and thresholds to control and monitor risk across transactions, products, businesses and markets. The Board, directly or indirectly through its Risk Committee, approves limits and thresholds included in our risk appetite statement at firmwide, business and product levels. In addition, the Firmwide Enterprise Risk Committee is responsible for approving our risk limits framework, subject to the overall limits approved by the Risk Committee of the Board, at a variety of levels and monitoring these limits on a daily basis. The Risk Governance Committee is responsible for approving limits at firmwide, business and product levels. Certain limits may be set at levels that will require periodic adjustment, rather than at levels that reflect our maximum risk appetite. This fosters an ongoing dialogue about risk among our first and second lines of defense, committees and senior management, as well as rapid escalation of risk-related matters. See "Liquidity Risk Management," "Market Risk Management," "Credit Risk Management" and "Operational Risk Management" for further information.

Active management of our positions is another important process. Proactive mitigation of our market and credit exposures minimizes the risk that we will be required to take outsized actions during periods of stress.

Effective risk reporting and risk decision-making depends on our ability to get the right information to the right people at the right time. As such, we focus on the rigor and effectiveness of our risk systems, with the objective of ensuring that our risk management technology systems are comprehensive, reliable and timely. We devote significant time and resources to our risk management technology to ensure that it consistently provides us with complete, accurate and timely information.

**People.** Even the best technology serves only as a tool for helping to make informed decisions in real time about the risks we are taking. Ultimately, effective risk management requires our people to interpret our risk data on an ongoing and timely basis and adjust risk positions accordingly. The experience of our professionals, and their understanding of the nuances and limitations of each risk measure, guides us in assessing exposures and maintaining them within prudent levels.

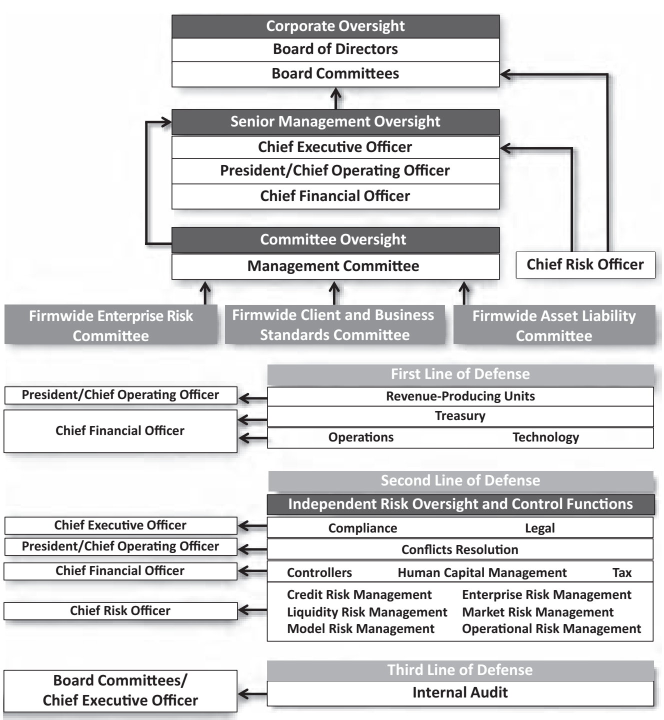
We reinforce a culture of effective risk management, consistent with our risk appetite, in our training and development programs, as well as in the way we evaluate performance, and recognize and reward our people. Our training and development programs, including certain sessions led by our most senior leaders, are focused on the importance of risk management, client relationships and reputational excellence. As part of our annual performance review process, we assess reputational excellence, including how an employee exercises good risk management and reputational judgment, and adheres to our code of conduct and compliance policies. Our review and reward processes are designed to communicate and reinforce to our professionals the link between behavior and how people are recognized, the need to focus on our clients and our reputation, and the need to always act in accordance with our highest standards.

### Structure

Ultimate oversight of risk is the responsibility of our Board. The Board oversees risk both directly and through its committees, including its Risk Committee. We have a series of committees with specific risk management mandates that have oversight or decision-making responsibilities for risk management activities. Committee membership generally consists of senior managers from both our first and second lines of defense. We have established procedures for these committees to ensure that appropriate information barriers are in place. Our primary risk committees, most of which also have additional sub-committees or working groups, are described below. In addition to these committees, we have other risk-oriented committees that provide oversight for different businesses, activities, products, regions and entities. All of our committees have responsibility for considering the impact of transactions and activities, which they oversee, on our reputation.

Membership of our risk committees is reviewed regularly and updated to reflect changes in the responsibilities of the committee members. Accordingly, the length of time that members serve on the respective committees varies as determined by the committee chairs and based on the responsibilities of the members.

The chart below presents an overview of our risk management governance structure, our three lines of defense and our reporting relationships.




**Management Committee.** The Management Committee oversees our global activities. It provides this oversight directly and through authority delegated to committees it has established. This committee consists of our most senior leaders, and is chaired by our chief executive officer. Most members of the Management Committee are also members of other committees. The following are the committees that are principally involved in firmwide risk management.

**Firmwide Enterprise Risk Committee.** The Firmwide Enterprise Risk Committee is responsible for the ongoing review, approval and monitoring of the enterprise risk management framework and for providing oversight of our aggregate financial and nonfinancial risks. As a part of such oversight, the committee is responsible for the ongoing approval and monitoring of our risk limits framework at the firmwide, business and product levels. This committee is co-chaired by our chief financial officer and our chief risk officer, who are appointed as chairs by our chief executive officer, and reports to the Management Committee. The following are the primary committees that report to the Firmwide Enterprise Risk Committee:

- **Firmwide Risk Committee.** The Firmwide Risk Committee is globally responsible for the ongoing monitoring of relevant financial risks and related risk limits at the firmwide, business and product levels. This committee is co-chaired by the chairs of the Firmwide Enterprise Risk Committee.
- **Firmwide New Activity Committee.** The Firmwide New Activity Committee is responsible for reviewing new activities and for establishing a process to identify and review previously approved activities that are significant and that have changed in complexity and/or structure or present different reputational and suitability concerns over time to consider whether these activities remain appropriate. This committee is co-chaired by the head of regulatory controllers and the co-head of Europe, Middle East and Africa FICC sales, who are appointed as chairs by the chairs of the Firmwide Enterprise Risk Committee.
- **Firmwide Model Risk Control Committee.** The Firmwide Model Risk Control Committee is responsible for oversight of the development and implementation of model risk controls, which includes governance, policies and procedures related to our reliance on financial models. This committee is chaired by our deputy chief risk officer, who is appointed as chair by the chairs of the Firmwide Enterprise Risk Committee.

- **Firmwide Conduct and Operational Risk Committee.** The Firmwide Conduct and Operational Risk Committee is globally responsible for the ongoing approval and monitoring of the frameworks, policies, parameters and limits which govern our conduct and operational risks. This committee is co-chaired by a managing director in Global Compliance and our deputy chief risk officer, who are appointed as chairs by the chairs of the Firmwide Enterprise Risk Committee.
- **Firmwide Technology Risk Committee.** The Firmwide Technology Risk Committee reviews matters related to the design, development, deployment and use of technology. This committee oversees cyber security matters, as well as technology risk management frameworks and methodologies, and monitors their effectiveness. This committee is co-chaired by our chief information officer and the head of Global Investment Research, who are appointed as chairs by the chairs of the Firmwide Enterprise Risk Committee.
- **Global Business Resilience Committee.** The Global Business Resilience Committee is responsible for oversight of business resilience initiatives, promoting increased levels of security and resilience, and reviewing certain operating risks related to business resilience. This committee is chaired by our chief administrative officer, who is appointed as chair by the chairs of the Firmwide Enterprise Risk Committee.
- **Risk Governance Committee.** The Risk Governance Committee (through delegated authority from the Firmwide Enterprise Risk Committee) is globally responsible for the ongoing approval and monitoring of risk frameworks, policies, parameters and limits, at firmwide, business and product levels. In addition, this committee reviews the results of stress tests and scenario analyses. This committee is chaired by our chief risk officer, who is appointed as chair by the chairs of the Firmwide Enterprise Risk Committee.
- **Firmwide Volcker Oversight Committee.** The Firmwide Volcker Oversight Committee is responsible for the oversight and periodic review of the implementation of our Volcker Rule compliance program, as approved by the Board, and other Volcker Rule-related matters. This committee is co-chaired by the head of Market Risk Management and the deputy head of Compliance, who are appointed as chairs by the chairs of the Firmwide Enterprise Risk Committee.

**Firmwide Client and Business Standards Committee.** The Firmwide Client and Business Standards Committee assesses and makes determinations regarding relationships with our clients, client service and experience, and related business standards and reputational risk. This committee is chaired by our president and chief operating officer, who is appointed as chair by the chief executive officer, and reports to the Management Committee. This committee periodically provides updates to, and receives guidance from, the Public Responsibilities Committee of the Board.

The following committees report jointly to the Firmwide Enterprise Risk Committee and the Firmwide Client and Business Standards Committee:

- **Firmwide Reputational Risk Committee.** The Firmwide Reputational Risk Committee is responsible for assessing reputational risks arising from transactions that have been identified as having potential heightened reputational risk pursuant to the criteria established by the Firmwide Reputational Risk Committee. This committee is chaired by our president and chief operating officer, and the vice-chairs are the head of Compliance and the head of Conflicts Resolution, who are appointed as vice-chairs by the chair of the Firmwide Reputational Risk Committee.
- **Firmwide Suitability Committee.** The Firmwide Suitability Committee is responsible for setting standards and policies for product, transaction and client suitability and providing a forum for consistency across functions, regions and products on suitability assessments. This committee also reviews suitability matters escalated from other committees. This committee is co-chaired by the deputy head of Compliance, and the co-head of Europe, Middle East and Africa FICC sales, who are appointed as chairs by the chair of the Firmwide Client and Business Standards Committee.
- **Firmwide Investment Policy Committee.** The Firmwide Investment Policy Committee reviews, approves, sets policies, and provides oversight for certain illiquid principal investments, including review of risk management and controls for these types of investments. This committee is co-chaired by the head of our Merchant Banking Division and the head of the Special Situations Group, who are appointed as chairs by our president and chief operating officer and our chief financial officer.

- **Firmwide Capital Committee.** The Firmwide Capital Committee provides approval and oversight of debt-related transactions, including principal commitments of our capital. This committee aims to ensure that business, reputational and suitability standards for underwritings and capital commitments are maintained on a global basis. This committee is co-chaired by the head of Credit Risk Management and a co-head of the Financing Group, who are appointed as chairs by the chairs of the Firmwide Enterprise Risk Committee.
- **Firmwide Commitments Committee.** The Firmwide Commitments Committee reviews our underwriting and distribution activities with respect to equity and equity-related product offerings, and sets and maintains policies and procedures designed to ensure that legal, reputational, regulatory and business standards are maintained on a global basis. In addition to reviewing specific transactions, this committee periodically conducts general strategic reviews of sectors and products and establishes policies in connection with transaction practices. This committee is co-chaired by the co-head of the Industrials Group in our Investment Banking Division, an advisory director and a managing director in Risk Management, who are appointed as chairs by the chair of the Firmwide Client and Business Standards Committee.

**Firmwide Asset Liability Committee.** The Firmwide Asset Liability Committee reviews and approves the strategic direction for our financial resources, including capital, liquidity, funding and balance sheet. This committee has oversight responsibility for asset liability management, including interest rate and currency risk, funds transfer pricing, capital allocation and incentives, and credit ratings. This committee makes recommendations as to any adjustments to asset liability management and financial resource allocation in light of current events, risks, exposures, and regulatory requirements and approves related policies. This committee is co-chaired by our chief financial officer and our global treasurer, who are appointed as chairs by our chief executive officer, and reports to the Management Committee.

### Conflicts Management

Conflicts of interest and our approach to dealing with them are fundamental to our client relationships, our reputation and our long-term success. The term "conflict of interest" does not have a universally accepted meaning, and conflicts can arise in many forms within a business or between businesses. The responsibility for identifying potential conflicts, as well as complying with our policies and procedures, is shared by all of our employees.

We have a multilayered approach to resolving conflicts and addressing reputational risk. Our senior management oversees policies related to conflicts resolution, and, in conjunction with Conflicts Resolution, Legal and Compliance, the Firmwide Client and Business Standards Committee, and other internal committees, formulates policies, standards and principles, and assists in making judgments regarding the appropriate resolution of particular conflicts. Resolving potential conflicts necessarily depends on the facts and circumstances of a particular situation and the application of experienced and informed judgment.

As a general matter, Conflicts Resolution reviews financing and advisory assignments in Investment Banking and certain of our investing, lending and other activities. In addition, we have various transaction oversight committees, such as the Firmwide Capital, Commitments and Suitability Committees and other committees that also review new underwritings, loans, investments and structured products. These groups and committees work with internal and external counsel and Compliance to evaluate and address any actual or potential conflicts. Conflicts Resolution reports to our president and chief operating officer.

We regularly assess our policies and procedures that address conflicts of interest in an effort to conduct our business in accordance with the highest ethical standards and in compliance with all applicable laws, rules and regulations.

## Liquidity Risk Management

### Overview

Liquidity risk is the risk that we will be unable to fund ourselves or meet our liquidity needs in the event of firm-specific, broader industry or market liquidity stress events. We have in place a comprehensive and conservative set of liquidity and funding policies. Our principal objective is to be able to fund ourselves and to enable our core businesses to continue to serve clients and generate revenues, even under adverse circumstances.

Treasury, which reports to our chief financial officer, has primary responsibility for developing, managing and executing our liquidity and funding strategy within our risk appetite.

Liquidity Risk Management, which is independent of our revenue-producing units and Treasury, and reports to our chief risk officer, has primary responsibility for assessing, monitoring and managing our liquidity risk through firmwide oversight across our global businesses and the establishment of stress testing and limits frameworks.

### Liquidity Risk Management Principles

We manage liquidity risk according to three principles: (i) hold sufficient excess liquidity in the form of GCLA to cover outflows during a stressed period, (ii) maintain appropriate Asset-Liability Management and (iii) maintain a viable Contingency Funding Plan.

**GCLA.** GCLA is liquidity that we maintain to meet a broad range of potential cash outflows and collateral needs in a stressed environment. A primary liquidity principle is to pre-fund our estimated potential cash and collateral needs during a liquidity crisis and hold this liquidity in the form of unencumbered, highly liquid securities and cash. We believe that the securities held in our GCLA would be readily convertible to cash in a matter of days, through liquidation, by entering into repurchase agreements or from maturities of resale agreements, and that this cash would allow us to meet immediate obligations without needing to sell other assets or depend on additional funding from credit-sensitive markets.

Our GCLA reflects the following principles:

- The first days or weeks of a liquidity crisis are the most critical to a company's survival;
- Focus must be maintained on all potential cash and collateral outflows, not just disruptions to financing flows. Our businesses are diverse, and our liquidity needs are determined by many factors, including market movements, collateral requirements and client commitments, all of which can change dramatically in a difficult funding environment;
- During a liquidity crisis, credit-sensitive funding, including unsecured debt, certain deposits and some types of secured financing agreements, may be unavailable, and the terms (e.g., interest rates, collateral provisions and tenor) or availability of other types of secured financing may change and certain deposits may be withdrawn; and
- As a result of our policy to pre-fund liquidity that we estimate may be needed in a crisis, we hold more unencumbered securities and have larger debt balances than our businesses would otherwise require. We believe that our liquidity is stronger with greater balances of highly liquid unencumbered securities, even though it increases our total assets and our funding costs.

We maintain our GCLA across Group Inc., Goldman Sachs Funding LLC (Funding IHC) and Group Inc.'s major broker-dealer and bank subsidiaries, asset types, and clearing agents to provide us with sufficient operating liquidity to ensure timely settlement in all major markets, even in a difficult funding environment. In addition to the GCLA, we maintain cash balances and securities in several of our other entities, primarily for use in specific currencies, entities or jurisdictions where we do not have immediate access to parent company liquidity.

We believe that our GCLA provides us with a resilient source of funds that would be available in advance of potential cash and collateral outflows and gives us significant flexibility in managing through a difficult funding environment.

**Asset-Liability Management.** Our liquidity risk management policies are designed to ensure we have a sufficient amount of financing, even when funding markets experience persistent stress. We manage the maturities and diversity of our funding across markets, products and counterparties, and seek to maintain a diversified funding profile with an appropriate tenor, taking into consideration the characteristics and liquidity profile of our assets.

Our approach to asset-liability management includes:

- Conservatively managing the overall characteristics of our funding book, with a focus on maintaining long-term, diversified sources of funding in excess of our current requirements. See "Balance Sheet and Funding Sources — Funding Sources" for further information;

- Actively managing and monitoring our asset base, with particular focus on the liquidity, holding period and our ability to fund assets on a secured basis. We assess our funding requirements and our ability to liquidate assets in a stressed environment while appropriately managing risk. This enables us to determine the most appropriate funding products and tenors. See "Balance Sheet and Funding Sources — Balance Sheet Management" for further information about our balance sheet management process and "— Funding Sources — Secured Funding" for further information about asset classes that may be harder to fund on a secured basis; and
- Raising secured and unsecured financing that has a long tenor relative to the liquidity profile of our assets. This reduces the risk that our liabilities will come due in advance of our ability to generate liquidity from the sale of our assets. Because we maintain a highly liquid balance sheet, the holding period of certain of our assets may be materially shorter than their contractual maturity dates.

Our goal is to ensure that we maintain sufficient liquidity to fund our assets and meet our contractual and contingent obligations in normal times, as well as during periods of market stress. Through our dynamic balance sheet management process, we use actual and projected asset balances to determine secured and unsecured funding requirements. Funding plans are reviewed and approved by the Firmwide Asset Liability Committee. In addition, our independent risk oversight and control functions analyze, and the Firmwide Asset Liability Committee reviews, our consolidated total capital position (unsecured long-term borrowings plus total shareholders' equity) so that we maintain a level of long-term funding that is sufficient to meet our long-term financing requirements. In a liquidity crisis, we would first use our GCLA in order to avoid reliance on asset sales (other than our GCLA). However, we recognize that orderly asset sales may be prudent or necessary in a severe or persistent liquidity crisis.

### *Subsidiary Funding Policies*

The majority of our unsecured funding is raised by Group Inc., which lends the necessary funds to Funding IHC and other subsidiaries, some of which are regulated, to meet their asset financing, liquidity and capital requirements. In addition, Group Inc. provides its regulated subsidiaries with the necessary capital to meet their regulatory requirements. The benefits of this approach to subsidiary funding are enhanced control and greater flexibility to meet the funding requirements of our subsidiaries. Funding is also raised at the subsidiary level through a variety of products, including deposits, secured funding and unsecured borrowings.

Our intercompany funding policies assume that a subsidiary's funds or securities are not freely available to its parent, Funding IHC or other subsidiaries unless (i) legally provided for and (ii) there are no additional regulatory, tax or other restrictions. In particular, many of our subsidiaries are subject to laws that authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to Group Inc. or Funding IHC. Regulatory action of that kind could impede access to funds that Group Inc. needs to make payments on its obligations. Accordingly, we assume that the capital provided to our regulated subsidiaries is not available to Group Inc. or other subsidiaries and any other financing provided to our regulated subsidiaries is not available to Group Inc. or Funding IHC until the maturity of such financing.

Group Inc. has provided substantial amounts of equity and subordinated indebtedness, directly or indirectly, to its regulated subsidiaries. For example, as of December 2018, Group Inc. had $29.05 billion of equity and subordinated indebtedness invested in GS&Co., its principal U.S. registered broker-dealer; $39.69 billion invested in GSI, a regulated U.K. broker-dealer; $2.76 billion invested in GSJCL, a regulated Japanese broker-dealer; $31.98 billion invested in GS Bank USA, a regulated New York State-chartered bank; and $3.93 billion invested in GSIB, a regulated U.K. bank. Group Inc. also provided, directly or indirectly, $114.38 billion of unsubordinated loans (including secured loans of $28.72 billion), and $18.09 billion of collateral and cash deposits to these entities, substantially all of which was to GS&Co., GSI, GSJCL and GS Bank USA, as of December 2018. In addition, as of December 2018, Group Inc. had significant amounts of capital invested in and loans to its other regulated subsidiaries.

**Contingency Funding Plan.** We maintain a contingency funding plan to provide a framework for analyzing and responding to a liquidity crisis situation or periods of market stress. Our contingency funding plan outlines a list of potential risk factors, key reports and metrics that are reviewed on an ongoing basis to assist in assessing the severity of, and managing through, a liquidity crisis and/or market dislocation. The contingency funding plan also describes in detail our potential responses if our assessments indicate that we have entered a liquidity crisis, which include pre-funding for what we estimate will be our potential cash and collateral needs, as well as utilizing secondary sources of liquidity. Mitigants and action items to address specific risks which may arise are also described and assigned to individuals responsible for execution.

The contingency funding plan identifies key groups of individuals to foster effective coordination, control and distribution of information, all of which are critical in the management of a crisis or period of market stress. The contingency funding plan also provides information about the responsibilities of these groups and individuals, which include making and disseminating key decisions, coordinating all contingency activities throughout the duration of the crisis or period of market stress, implementing liquidity maintenance activities and managing internal and external communication.

**Stress Tests**

In order to determine the appropriate size of our GCLA, we use an internal liquidity model, referred to as the Modeled Liquidity Outflow, which captures and quantifies our liquidity risks. We also consider other factors, including, but not limited to, an assessment of our potential intraday liquidity needs through an additional internal liquidity model, referred to as the Intraday Liquidity Model, the results of our long-term stress testing models, our resolution liquidity models and other applicable regulatory requirements and a qualitative assessment of our condition, as well as the financial markets. The results of the Modeled Liquidity Outflow, the Intraday Liquidity Model, the long-term stress testing models and the resolution liquidity models are reported to senior management on a regular basis. We also perform stress tests that are designed to ensure a comprehensive analysis of our vulnerabilities and idiosyncratic risks combining financial and nonfinancial risks, including, but not limited to, credit, market, liquidity and funding, operational and compliance, strategic, systemic and emerging risks into a single combined scenario.

**Modeled Liquidity Outflow.** Our Modeled Liquidity Outflow is based on conducting multiple scenarios that include combinations of market-wide and firm-specific stress. These scenarios are characterized by the following qualitative elements:

- Severely challenged market environments, including low consumer and corporate confidence, financial and political instability, adverse changes in market values, including potential declines in equity markets and widening of credit spreads; and
- A firm-specific crisis potentially triggered by material losses, reputational damage, litigation, executive departure, and/or a ratings downgrade.

The following are key modeling elements of the Modeled Liquidity Outflow:

- Liquidity needs over a 30-day scenario;
- A two-notch downgrade of our long-term senior unsecured credit ratings;
- A combination of contractual outflows, such as upcoming maturities of unsecured debt, and contingent outflows (e.g., actions, though not contractually required, we may deem necessary in a crisis). We assume that most contingent outflows will occur within the initial days and weeks of a crisis;
- No issuance of equity or unsecured debt;
- No support from additional government funding facilities. Although we have access to various central bank funding programs, we do not assume reliance on additional sources of funding in a liquidity crisis; and
- No asset liquidation, other than the GCLA.

The potential contractual and contingent cash and collateral outflows covered in our Modeled Liquidity Outflow include:

***Unsecured Funding***

- Contractual: All upcoming maturities of unsecured long-term debt, commercial paper and other unsecured funding products. We assume that we will be unable to issue new unsecured debt or roll over any maturing debt.
- Contingent: Repurchases of our outstanding long-term debt, commercial paper and hybrid financial instruments in the ordinary course of business as a market maker.

***Deposits***

- Contractual: All upcoming maturities of term deposits. We assume that we will be unable to raise new term deposits or roll over any maturing term deposits.
- Contingent: Partial withdrawals of deposits that have no contractual maturity. The withdrawal assumptions reflect, among other factors, the type of deposit, whether the deposit is insured or uninsured, and our relationship with the depositor.

***Secured Funding***

- Contractual: A portion of upcoming contractual maturities of secured funding due to either the inability to refinance or the ability to refinance only at wider haircuts (i.e., on terms which require us to post additional collateral). Our assumptions reflect, among other factors, the quality of the underlying collateral, counterparty roll probabilities (our assessment of the counterparty's likelihood of continuing to provide funding on a secured basis at the maturity of the trade) and counterparty concentration.
- Contingent: Adverse changes in the value of financial assets pledged as collateral for financing transactions, which would necessitate additional collateral postings under those transactions.

***OTC Derivatives***

- Contingent: Collateral postings to counterparties due to adverse changes in the value of our OTC derivatives, excluding those that are cleared and settled through central counterparties (OTC-cleared).
- Contingent: Other outflows of cash or collateral related to OTC derivatives, excluding OTC-cleared, including the impact of trade terminations, collateral substitutions, collateral disputes, loss of rehypothecation rights, collateral calls or termination payments required by a two-notch downgrade in our credit ratings, and collateral that has not been called by counterparties, but is available to them.

***Exchange-Traded and OTC-cleared Derivatives***

- Contingent: Variation margin postings required due to adverse changes in the value of our outstanding exchange-traded and OTC-cleared derivatives.
- Contingent: An increase in initial margin and guaranty fund requirements by derivative clearing houses.

***Customer Cash and Securities***

- Contingent: Liquidity outflows associated with our prime brokerage business, including withdrawals of customer credit balances, and a reduction in customer short positions, which may serve as a funding source for long positions.

***Securities***

- Contingent: Liquidity outflows associated with a reduction or composition change in our short positions, which may serve as a funding source for long positions.

***Unfunded Commitments***

- Contingent: Draws on our unfunded commitments. Draw assumptions reflect, among other things, the type of commitment and counterparty.

***Other***

- Other upcoming large cash outflows, such as tax payments.

**Intraday Liquidity Model.** Our Intraday Liquidity Model measures our intraday liquidity needs using a scenario analysis characterized by the same qualitative elements as our Modeled Liquidity Outflow. The model assesses the risk of increased intraday liquidity requirements during a scenario where access to sources of intraday liquidity may become constrained.

The following are key modeling elements of the Intraday Liquidity Model:

- Liquidity needs over a one-day settlement period;
- Delays in receipt of counterparty cash payments;
- A reduction in the availability of intraday credit lines at our third-party clearing agents; and
- Higher settlement volumes due to an increase in activity.

**Long-Term Stress Testing.** We utilize longer-term stress tests to take a forward view on our liquidity position through prolonged stress periods in which we experience a severe liquidity stress and recover in an environment that continues to be challenging. We are focused on ensuring conservative asset-liability management to prepare for a prolonged period of potential stress, seeking to maintain a diversified funding profile with an appropriate tenor, taking into consideration the characteristics and liquidity profile of our assets.

We also perform stress tests on a regular basis as part of our routine risk management processes and conduct tailored stress tests on an ad hoc or product-specific basis in response to market developments.

**Resolution Liquidity Models.** In connection with our resolution planning efforts, we have established our Resolution Liquidity Adequacy and Positioning framework, which estimates liquidity needs of our major subsidiaries in a stressed environment. The liquidity needs are measured using our Modeled Liquidity Outflow assumptions and include certain additional inter-affiliate exposures. We have also established our Resolution Liquidity Execution Need framework, which measures the liquidity needs of our major subsidiaries to stabilize and wind-down following a Group Inc. bankruptcy filing in accordance with our preferred resolution strategy.

In addition, we have established a triggers and alerts framework, which is designed to provide the Board with information needed to make an informed decision on whether and when to commence bankruptcy proceedings for Group Inc.

### Model Review and Validation

We regularly refine our Modeled Liquidity Outflow, Intraday Liquidity Model and our other stress testing models to reflect changes in market or economic conditions and our business mix. Any changes, including model assumptions, are approved by Liquidity Risk Management. Significant changes to these models are also approved by the Risk Governance Committee.

These models are independently reviewed, validated and approved by Model Risk Management. See "Model Risk Management" for further information.

### Limits

We use liquidity limits at various levels and across liquidity risk types to manage the size of our liquidity exposures. Limits are measured relative to acceptable levels of risk given our liquidity risk tolerance. The purpose of the firmwide limits is to assist senior management in monitoring and controlling our overall liquidity profile.

The Risk Committee of the Board and the Risk Governance Committee approve liquidity risk limits at the firmwide level, consistent with our risk appetite statement. Limits are reviewed frequently and amended, with required approvals, on a permanent and temporary basis, as appropriate, to reflect changing market or business conditions.

Our liquidity risk limits are monitored by Treasury and Liquidity Risk Management. Liquidity Risk Management is responsible for identifying and escalating to senior management and/or the appropriate risk committee, on a timely basis, instances where limits have been exceeded.

### GCLA and Unencumbered Metrics

**GCLA.** Based on the results of our internal liquidity risk models, described above, as well as our consideration of other factors, including, but not limited to, an assessment of our potential intraday liquidity needs and a qualitative assessment of our condition, as well as the financial markets, we believe our liquidity position as of both December 2018 and December 2017 was appropriate. We strictly limit our GCLA to a narrowly defined list of securities and cash because they are highly liquid, even in a difficult funding environment. We do not include other potential sources of excess liquidity in our GCLA, such as less liquid unencumbered securities or committed credit facilities.

The table below presents information about our average GCLA.

| | Average for the Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Denomination** | | |
| U.S. dollar | **$155,348** | $155,020 |
| Non-U.S. dollar | **77,995** | 63,528 |
| **Total** | **$233,343** | $218,548 |
| **Asset Class** | | |
| Overnight cash deposits | **$ 98,811** | $ 93,617 |
| U.S. government obligations | **79,810** | 75,108 |
| U.S. agency obligations | **12,171** | 11,813 |
| Non-U.S. government obligations | **42,551** | 38,010 |
| **Total** | **$233,343** | $218,548 |
| **Entity Type** | | |
| Group Inc. and Funding IHC | **$ 40,920** | $ 37,507 |
| Major broker-dealer subsidiaries | **104,364** | 98,160 |
| Major bank subsidiaries | **88,059** | 82,881 |
| **Total** | **$233,343** | $218,548 |

In the table above:

- The U.S. dollar-denominated GCLA consists of (i) unencumbered U.S. government and agency obligations (including highly liquid U.S. agency mortgage-backed obligations), all of which are eligible as collateral in Federal Reserve open market operations and (ii) certain overnight U.S. dollar cash deposits.
- The non-U.S. dollar-denominated GCLA consists of non-U.S. government obligations (only unencumbered German, French, Japanese and U.K. government obligations) and certain overnight cash deposits in highly liquid currencies.

We maintain our GCLA to enable us to meet current and potential liquidity requirements of our parent company, Group Inc., and its subsidiaries. Our Modeled Liquidity Outflow and Intraday Liquidity Model incorporate a consolidated requirement for Group Inc., as well as a standalone requirement for each of our major broker-dealer and bank subsidiaries. Funding IHC is required to provide the necessary liquidity to Group Inc. during the ordinary course of business, and is also obligated to provide capital and liquidity support to major subsidiaries in the event of our material financial distress or failure. Liquidity held directly in each of our major broker-dealer and bank subsidiaries is intended for use only by that subsidiary to meet its liquidity requirements and is assumed not to be available to Group Inc. or Funding IHC unless (i) legally provided for and (ii) there are no additional regulatory, tax or other restrictions. In addition, the Modeled Liquidity Outflow and Intraday Liquidity Model also incorporate a broader assessment of standalone liquidity requirements for other subsidiaries and we hold a portion of our GCLA directly at Group Inc. or Funding IHC to support such requirements.

**Other Unencumbered Assets.** In addition to our GCLA, we have a significant amount of other unencumbered cash and financial instruments, including other government obligations, high-grade money market securities, corporate obligations, marginable equities, loans and cash deposits not included in our GCLA. The fair value of our unencumbered assets averaged $177.08 billion for 2018 and $158.41 billion for 2017. We do not consider these assets liquid enough to be eligible for our GCLA.

### Liquidity Regulatory Framework

As a BHC, we are subject to a minimum Liquidity Coverage Ratio (LCR) under the LCR rule approved by the U.S. federal bank regulatory agencies. The LCR rule requires organizations to maintain an adequate ratio of eligible high-quality liquid assets (HQLA) to expected net cash outflows under an acute short-term liquidity stress scenario. Eligible HQLA excludes HQLA held by subsidiaries that is in excess of their minimum requirement and is subject to transfer restrictions. We are required to maintain a minimum LCR of 100%. We expect that fluctuations in client activity, business mix and the market environment will impact our average LCR.

The table below presents information about our average daily LCR.

| | Average for the Three Months Ended | |
|---|---|---|
| *$ in millions* | **December 2018** | September 2018 |
| Total HQLA | **$226,473** | $233,721 |
| Eligible HQLA | **$160,016** | $170,621 |
| Net cash outflows | **$126,511** | $133,126 |
| **LCR** | **127%** | 128% |

In addition, the U.S. federal bank regulatory agencies have issued a proposed rule that calls for a net stable funding ratio (NSFR) for large U.S. banking organizations. The proposal would require banking organizations to ensure they have access to stable funding over a one-year time horizon. The proposed rule includes quarterly disclosure of the ratio and a description of the banking organization's stable funding sources. The U.S. federal bank regulatory agencies have not released the final rule. We expect that we will be compliant with the NSFR requirement when it is effective.

The following is information about our subsidiary liquidity regulatory requirements:

- **GS Bank USA.** GS Bank USA is subject to a minimum LCR of 100% under the LCR rule approved by the U.S. federal bank regulatory agencies. As of December 2018, GS Bank USA's LCR exceeded the minimum requirement. The NSFR requirement described above would also apply to GS Bank USA.
- **GSI.** GSI is subject to a minimum LCR of 100% under the LCR rule approved by the U.K. regulatory authorities and the European Commission. GSI's average monthly LCR for the trailing twelve-month period ended December 2018 exceeded the minimum requirement.
- **Other Subsidiaries.** We monitor local regulatory liquidity requirements of our subsidiaries to ensure compliance. For many of our subsidiaries, these requirements either have changed or are likely to change in the future due to the implementation of the Basel Committee's framework for liquidity risk measurement, standards and monitoring, as well as other regulatory developments.

The implementation of these rules and any amendments adopted by the regulatory authorities, could impact our liquidity and funding requirements and practices in the future.

### Credit Ratings

We rely on the short-term and long-term debt capital markets to fund a significant portion of our day-to-day operations and the cost and availability of debt financing is influenced by our credit ratings. Credit ratings are also important when we are competing in certain markets, such as OTC derivatives, and when we seek to engage in longer-term transactions. See "Risk Factors" in Part I, Item 1A of this Form 10-K for information about the risks associated with a reduction in our credit ratings.

The table below presents the unsecured credit ratings and outlook of Group Inc.

| | As of December 2018 | | | | |
|---|---|---|---|---|---|
| | DBRS | Fitch | Moody's | R&I | S&P |
| Short-term debt | R-1 (middle) | F1 | P-2 | a-1 | A-2 |
| Long-term debt | A(high) | A | A3 | A | BBB+ |
| Subordinated debt | A | A- | Baa2 | A- | BBB- |
| Trust preferred | A | BBB- | Baa3 | N/A | BB |
| Preferred stock | BBB (high) | BB+ | Ba1 | N/A | BB |
| Ratings outlook | Stable | Stable | Stable | Stable | Stable |

In the table above:

- The ratings and outlook are by DBRS, Inc. (DBRS), Fitch, Moody's, Rating and Investment Information, Inc. (R&I), and S&P.
- The ratings for trust preferred relate to the guaranteed preferred beneficial interests issued by Goldman Sachs Capital I.
- The DBRS, Fitch, Moody's and S&P ratings for preferred stock include the APEX issued by Goldman Sachs Capital II and Goldman Sachs Capital III.

The table below presents the unsecured credit ratings and outlook of GS Bank USA, GSIB, GS&Co. and GSI, by Fitch, Moody's and S&P.

| | As of December 2018 | | |
|---|---|---|---|
| | Fitch | Moody's | S&P |
| **GS Bank USA** | | | |
| Short-term debt | F1 | P-1 | A-1 |
| Long-term debt | A+ | A1 | A+ |
| Short-term bank deposits | F1+ | P-1 | N/A |
| Long-term bank deposits | AA- | A1 | N/A |
| Ratings outlook | Stable | Negative | Stable |
| **GSIB** | | | |
| Short-term debt | F1 | P-1 | A-1 |
| Long-term debt | A | A1 | A+ |
| Short-term bank deposits | F1 | P-1 | N/A |
| Long-term bank deposits | A | A1 | N/A |
| Ratings outlook | Stable | Negative | Stable |
| **GS&Co.** | | | |
| Short-term debt | F1 | N/A | A-1 |
| Long-term debt | A+ | N/A | A+ |
| Ratings outlook | Stable | N/A | Stable |
| **GSI** | | | |
| Short-term debt | F1 | P-1 | A-1 |
| Long-term debt | A | A1 | A+ |
| Ratings outlook | Stable | Negative | Stable |

We believe our credit ratings are primarily based on the credit rating agencies' assessment of:

- Our liquidity, market, credit and operational risk management practices;
- The level and variability of our earnings;
- Our capital base;
- Our franchise, reputation and management;
- Our corporate governance; and
- The external operating and economic environment, including, in some cases, the assumed level of government support or other systemic considerations, such as potential resolution.

Certain of our derivatives have been transacted under bilateral agreements with counterparties who may require us to post collateral or terminate the transactions based on changes in our credit ratings. We manage our GCLA to ensure we would, among other potential requirements, be able to make the additional collateral or termination payments that may be required in the event of a two-notch reduction in our long-term credit ratings, as well as collateral that has not been called by counterparties, but is available to them.

See Note 7 to the consolidated financial statements for further information about derivatives with credit-related contingent features and the additional collateral or termination payments related to our net derivative liabilities under bilateral agreements that could have been called by counterparties in the event of a one-notch and two-notch downgrade in our credit ratings.

### Cash Flows

As a global financial institution, our cash flows are complex and bear little relation to our net earnings and net assets. Consequently, we believe that traditional cash flow analysis is less meaningful in evaluating our liquidity position than the liquidity and asset-liability management policies described above. Cash flow analysis may, however, be helpful in highlighting certain macro trends and strategic initiatives in our businesses.

**Year Ended December 2018.** Our cash and cash equivalents increased by $20.50 billion to $130.55 billion at the end of 2018, primarily due to net cash provided by financing activities and operating activities, partially offset by net cash used for investing activities. The net cash provided by financing activities primarily reflected increases in consumer deposits. The net cash provided by operating activities primarily reflected net earnings and a decrease in collateralized transactions, partially offset by an increase in financial instruments owned. The net cash used for investing activities was primarily to fund corporate and commercial real estate loans.

**Year Ended December 2017.** Our cash and cash equivalents decreased by $11.66 billion to $110.05 billion at the end of 2017. We used $18.23 billion in net cash for operating activities, reflecting a decrease in the net liability for receivables and payables due to client activity. We used $28.64 billion in net cash for investing activities, primarily to fund corporate and real estate loans, and investments in U.S. government and agency obligations accounted for as available-for-sale securities. We generated $35.21 billion in net cash from financing activities, primarily from net issuances of unsecured long-term borrowings and increases in institutional and consumer deposits, partially offset by repurchases of common stock.

**Year Ended December 2016.** Our cash and cash equivalents increased by $28.27 billion to $121.71 billion at the end of 2016. We generated $9.68 billion in net cash from investing activities, primarily from net cash acquired in business acquisitions. We generated $18.60 billion in net cash from financing activities and operating activities, primarily from increases in deposits and from net issuances of unsecured long-term borrowings, partially offset by repurchases of common stock.

## Market Risk Management

### Overview

Market risk is the risk of loss in the value of our inventory, as well as certain other financial assets and financial liabilities, due to changes in market conditions. We employ a variety of risk measures, each described in the respective sections below, to monitor market risk. We hold inventory primarily for market making for our clients and for our investing and lending activities. Our inventory, therefore, changes based on client demands and our investment opportunities. Our inventory is accounted for at fair value and therefore fluctuates on a daily basis, with the related gains and losses included in market making and other principal transactions. Categories of market risk include the following:

- Interest rate risk: results from exposures to changes in the level, slope and curvature of yield curves, the volatilities of interest rates, prepayment speeds and credit spreads;
- Equity price risk: results from exposures to changes in prices and volatilities of individual equities, baskets of equities and equity indices;
- Currency rate risk: results from exposures to changes in spot prices, forward prices and volatilities of currency rates; and
- Commodity price risk: results from exposures to changes in spot prices, forward prices and volatilities of commodities, such as crude oil, petroleum products, natural gas, electricity, and precious and base metals.

Market Risk Management, which is independent of our revenue-producing units and reports to our chief risk officer, has primary responsibility for assessing, monitoring and managing our market risk through firmwide oversight across our global businesses.

Managers in revenue-producing units and Market Risk Management discuss market information, positions and estimated loss scenarios on an ongoing basis. Managers in revenue-producing units are accountable for managing risk within prescribed limits. These managers have in-depth knowledge of their positions, markets and the instruments available to hedge their exposures.

### Market Risk Management Process

Our process for managing market risk includes:

- Collecting complete, accurate and timely information;
- A dynamic limit-setting framework;
- Monitoring compliance with established market risk limits and reporting our exposures;
- Diversifying exposures;
- Controlling position sizes;
- Evaluating mitigants, such as economic hedges in related securities or derivatives; and
- Proactive communication between our revenue-producing units and our independent risk oversight and control functions.

Our market risk management systems enable us to perform an independent calculation of VaR and stress measures, capture risk measures at individual position levels, attribute risk measures to individual risk factors of each position, report many different views of the risk measures (e.g., by desk, business, product type or entity) and produce ad hoc analyses in a timely manner.

### Risk Measures

Market Risk Management produces risk measures and monitors them against established market risk limits. These measures reflect an extensive range of scenarios and the results are aggregated at product, business and firmwide levels.

We use a variety of risk measures to estimate the size of potential losses for both moderate and more extreme market moves over both short-term and long-term time horizons. Our primary risk measures are VaR, which is used for shorter-term periods, and stress tests. Our risk reports detail key risks, drivers and changes for each desk and business, and are distributed daily to senior management of both our revenue-producing units and our independent risk oversight and control functions.

**Value-at-Risk.** VaR is the potential loss in value due to adverse market movements over a defined time horizon with a specified confidence level. For assets and liabilities included in VaR, see "Financial Statement Linkages to Market Risk Measures." We typically employ a one-day time horizon with a 95% confidence level. We use a single VaR model, which captures risks including interest rates, equity prices, currency rates and commodity prices. As such, VaR facilitates comparison across portfolios of different risk characteristics. VaR also captures the diversification of aggregated risk at the firmwide level.

We are aware of the inherent limitations to VaR and therefore use a variety of risk measures in our market risk management process. Inherent limitations to VaR include:

- VaR does not estimate potential losses over longer time horizons where moves may be extreme;
- VaR does not take account of the relative liquidity of different risk positions; and
- Previous moves in market risk factors may not produce accurate predictions of all future market moves.

To comprehensively capture our exposures and relevant risks in our VaR calculation, we use historical simulations with full valuation of market factors at the position level by simultaneously shocking the relevant market factors for that position. These market factors include spot prices, credit spreads, funding spreads, yield curves, volatility and correlation, and are updated periodically based on changes in the composition of positions, as well as variations in market conditions. We sample from five years of historical data to generate the scenarios for our VaR calculation. The historical data is weighted so that the relative importance of the data reduces over time. This gives greater importance to more recent observations and reflects current asset volatilities, which improves the accuracy of our estimates of potential loss. As a result, even if our positions included in VaR were unchanged, our VaR would increase with increasing market volatility and vice versa.

Given its reliance on historical data, VaR is most effective in estimating risk exposures in markets in which there are no sudden fundamental changes or shifts in market conditions.

Our VaR measure does not include:

- Positions that are best measured and monitored using sensitivity measures; and
- The impact of changes in counterparty and our own credit spreads on derivatives, as well as changes in our own credit spreads on financial liabilities for which the fair value option was elected.

We perform daily backtesting of our VaR model (i.e., comparing daily net revenues for positions included in VaR to the VaR measure calculated as of the prior business day) at the firmwide level and for each of our businesses and major regulated subsidiaries.

**Stress Testing.** Stress testing is a method of determining the effect of various hypothetical stress scenarios. We use stress testing to examine risks of specific portfolios, as well as the potential impact of our significant risk exposures. We use a variety of stress testing techniques to calculate the potential loss from a wide range of market moves on our portfolios, including sensitivity analysis, scenario analysis and stress tests. The results of our various stress tests are analyzed together for risk management purposes.

Sensitivity analysis is used to quantify the impact of a market move in a single risk factor across all positions (e.g., equity prices or credit spreads) using a variety of defined market shocks, ranging from those that could be expected over a one-day time horizon up to those that could take many months to occur. We also use sensitivity analysis to quantify the impact of the default of any single entity, which captures the risk of large or concentrated exposures.

Scenario analysis is used to quantify the impact of a specified event, including how the event impacts multiple risk factors simultaneously. For example, for sovereign stress testing we calculate potential direct exposure associated with our sovereign inventory, as well as the corresponding debt, equity and currency exposures associated with our non-sovereign inventory that may be impacted by the sovereign distress. When conducting scenario analysis, we typically consider a number of possible outcomes for each scenario, ranging from moderate to severely adverse market impacts. In addition, these stress tests are constructed using both historical events and forward-looking hypothetical scenarios.

Stress testing is designed to ensure a comprehensive analysis of our vulnerabilities and idiosyncratic risks combining financial and nonfinancial risks, including, but not limited to, market, credit, liquidity and funding, operational and compliance, strategic, systemic and emerging risks into a single combined scenario. Stress tests are primarily used to assess capital adequacy as part of our capital planning and stress testing process; however, stress testing is also integrated into our risk governance framework. This includes selecting appropriate scenarios to use for our capital planning and stress testing process. See "Equity Capital Management and Regulatory Capital — Equity Capital Management" for further information.

Unlike VaR measures, which have an implied probability because they are calculated at a specified confidence level, there is generally no implied probability that our stress test scenarios will occur. Instead, stress tests are used to model both moderate and more extreme moves in underlying market factors. When estimating potential loss, we generally assume that our positions cannot be reduced or hedged (although experience demonstrates that we are generally able to do so).

Stress test scenarios are conducted on a regular basis as part of our routine risk management process and on an ad hoc basis in response to market events or concerns. Stress testing is an important part of our risk management process because it allows us to quantify our exposure to tail risks, highlight potential loss concentrations, undertake risk/reward analysis, and assess and mitigate our risk positions.

### Limits

We use risk limits at various levels (including firmwide, business and product) to govern our risk appetite by controlling the size of our exposures to market risk. Limits are set based on VaR and on a range of stress tests relevant to our exposures. Limits are reviewed frequently and amended on a permanent or temporary basis to reflect changing market conditions, business conditions or tolerance for risk.

The Risk Committee of the Board and the Risk Governance Committee approve market risk limits and sub-limits at firmwide, business and product levels, consistent with our risk appetite statement. In addition, Market Risk Management (through delegated authority from the Risk Governance Committee) sets market risk limits and sub-limits at certain product and desk levels.

The purpose of the firmwide limits is to assist senior management in controlling our overall risk profile. Sub-limits are set below the approved level of risk limits. Sub-limits set the desired maximum amount of exposure that may be managed by any particular business on a day-to-day basis without additional levels of senior management approval, effectively leaving day-to-day decisions to individual desk managers and traders. Accordingly, sub-limits are a management tool designed to ensure appropriate escalation rather than to establish maximum risk tolerance. Sub-limits also distribute risk among various businesses in a manner that is consistent with their level of activity and client demand, taking into account the relative performance of each area.

Our market risk limits are monitored by Market Risk Management, which is responsible for identifying and escalating to senior management and/or the appropriate risk committee, on a timely basis, instances where limits have been exceeded. When a risk limit has been exceeded (e.g., due to positional changes or changes in market conditions, such as increased volatilities or changes in correlations), it is escalated to senior management and/or the appropriate risk committee. Such instances are remediated by an inventory reduction and/or a temporary or permanent increase to the risk limit.

### Model Review and Validation

Our VaR and stress testing models are regularly reviewed by Market Risk Management and enhanced in order to incorporate changes in the composition of positions included in our market risk measures, as well as variations in market conditions. Prior to implementing significant changes to our assumptions and/or models, Model Risk Management performs model validations. Significant changes to our VaR and stress testing models are reviewed with our chief risk officer and chief financial officer, and approved by the Risk Governance Committee.

These models are independently reviewed, validated and approved by Model Risk Management. See "Model Risk Management" for further information.

### Metrics

We analyze VaR at the firmwide level and a variety of more detailed levels, including by risk category, business and region. The tables below present average daily VaR and period-end VaR, as well as the high and low VaR for the period. Diversification effect in the tables below represents the difference between total VaR and the sum of the VaRs for the four risk categories. This effect arises because the four market risk categories are not perfectly correlated.

The table below presents average daily VaR by risk category.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Interest rates | **$ 46** | $ 40 |
| Equity prices | **31** | 24 |
| Currency rates | **14** | 12 |
| Commodity prices | **11** | 13 |
| Diversification effect | **(42)** | (35) |
| **Total** | **$ 60** | $ 54 |

Our average daily VaR increased to $60 million in 2018 from $54 million in 2017, primarily due to increases in the equity prices and interest rates categories, partially offset by an increase in the diversification effect. The overall increase was due to increased exposures and higher levels of volatility.

The table below presents period-end VaR by risk category.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Interest rates | **$ 46** | $ 48 |
| Equity prices | **32** | 31 |
| Currency rates | **12** | 7 |
| Commodity prices | **11** | 9 |
| Diversification effect | **(44)** | (30) |
| **Total** | **$ 57** | $ 65 |

Our daily VaR decreased to $57 million as of December 2018 from $65 million as of December 2017, primarily due to an increase in the diversification effect, partially offset by an increase in the currency rates category. The overall decrease was primarily due to reduced exposures.

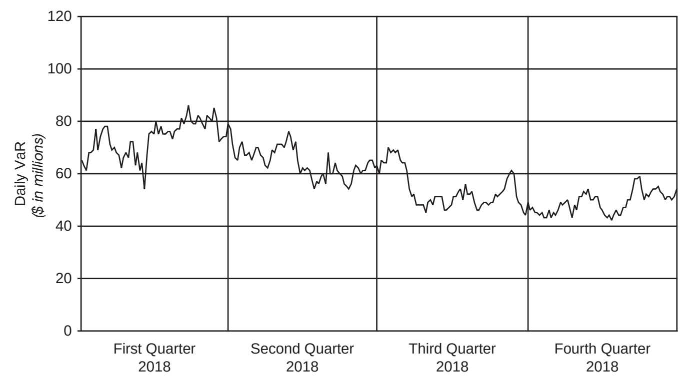
During 2018 and 2017, the firmwide VaR risk limit was not exceeded, raised or reduced.

The table below presents high and low VaR by risk category.

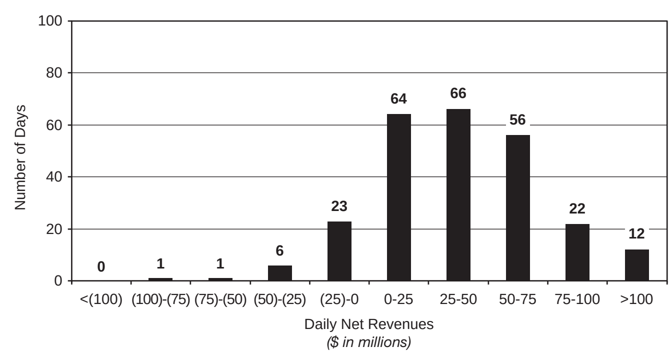
| | Year Ended December 2018 | | Year Ended December 2017 | |
|---|---|---|---|---|
| *$ in millions* | **High** | **Low** | High | Low |
| Interest rates | **$61** | **$34** | $57 | $29 |
| Equity prices | **$45** | **$24** | $38 | $17 |
| Currency rates | **$27** | **$ 7** | $28 | $ 6 |
| Commodity prices | **$17** | **$ 8** | $27 | $ 7 |

The high total VaR was $86 million for both 2018 and 2017, and the low total VaR was $42 million for 2018 and $37 million for 2017.

The chart below presents daily VaR for 2018.




The chart below presents the frequency distribution of daily net revenues for positions included in VaR for 2018.




Daily net revenues for positions included in VaR are compared with VaR calculated as of the end of the prior business day. Net losses incurred on a single day for such positions exceeded our 95% one-day VaR (i.e., a VaR exception) on two occasions during 2018 and did not exceed our 95% one-day VaR during 2017.

During periods in which we have significantly more positive net revenue days than net revenue loss days, we expect to have fewer VaR exceptions because, under normal conditions, our business model generally produces positive net revenues. In periods in which our franchise revenues are adversely affected, we generally have more loss days, resulting in more VaR exceptions. The daily net revenues for positions included in VaR used to determine VaR exceptions reflect the impact of any intraday activity, including bid/offer net revenues, which are more likely than not to be positive by their nature.

### Sensitivity Measures

Certain portfolios and individual positions are not included in VaR because VaR is not the most appropriate risk measure. Other sensitivity measures we use to analyze market risk are described below.

**10% Sensitivity Measures.** The table below presents market risk by asset category for positions accounted for at fair value, that are not included in VaR.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Equity | **$1,923** | $2,096 |
| Debt | **1,890** | 1,606 |
| **Total** | **$3,813** | $3,702 |

In the table above:

- The market risk of these positions is determined by estimating the potential reduction in net revenues of a 10% decline in the value of these positions.
- Equity positions relate to private and restricted public equity securities, including interests in funds that invest in corporate equities and real estate and interests in hedge funds.
- Debt positions include interests in funds that invest in corporate mezzanine and senior debt instruments, loans backed by commercial and residential real estate, corporate bank loans and other corporate debt, including acquired portfolios of distressed loans.
- Funded equity and debt positions are included in our consolidated statements of financial condition in financial instruments owned. See Note 6 to the consolidated financial statements for further information about cash instruments.
- These measures do not reflect the diversification effect across asset categories or across other market risk measures.

**Credit Spread Sensitivity on Derivatives and Financial Liabilities.** VaR excludes the impact of changes in counterparty and our own credit spreads on derivatives, as well as changes in our own credit spreads (debt valuation adjustment) on financial liabilities for which the fair value option was elected. The estimated sensitivity to a one basis point increase in credit spreads (counterparty and our own) on derivatives was a gain of $3 million (including hedges) as of both December 2018 and December 2017. In addition, the estimated sensitivity to a one basis point increase in our own credit spreads on financial liabilities for which the fair value option was elected was a gain of $41 million as of December 2018 and $35 million as of December 2017. However, the actual net impact of a change in our own credit spreads is also affected by the liquidity, duration and convexity (as the sensitivity is not linear to changes in yields) of those financial liabilities for which the fair value option was elected, as well as the relative performance of any hedges undertaken.

**Interest Rate Sensitivity.** Loans receivable were $80.59 billion as of December 2018 and $65.93 billion as of December 2017, substantially all of which had floating interest rates. The estimated sensitivity to a 100 basis point increase in interest rates on such loans was $607 million as of December 2018 and $527 million as of December 2017, of additional interest income over a twelve-month period, which does not take into account the potential impact of an increase in costs to fund such loans. See Note 9 to the consolidated financial statements for further information about loans receivable.

### Other Market Risk Considerations

As of both December 2018 and December 2017, we had commitments and held loans for which we have obtained credit loss protection from Sumitomo Mitsui Financial Group, Inc. See Note 18 to the consolidated financial statements for further information about such lending commitments.

In addition, we make investments in securities that are accounted for as available-for-sale and included in financial instruments owned in the consolidated statements of financial condition. See Note 6 to the consolidated financial statements for further information.

We also make investments accounted for under the equity method and we also make direct investments in real estate, both of which are included in other assets. Direct investments in real estate are accounted for at cost less accumulated depreciation. See Note 13 to the consolidated financial statements for further information about other assets.

### Financial Statement Linkages to Market Risk Measures

We employ a variety of risk measures, each described in the respective sections above, to monitor market risk across the consolidated statements of financial condition and consolidated statements of earnings. The related gains and losses on these positions are included in market making, other principal transactions, interest income and interest expense in the consolidated statements of earnings, and debt valuation adjustment in the consolidated statements of comprehensive income.

The table below presents certain categories of assets and liabilities in the consolidated statements of financial condition and the market risk measures used to assess those assets and liabilities.

| Categories in the Consolidated Statements of Financial Condition | Market Risk Measures |
|---|---|
| **Collateralized agreements, at fair value** | VaR |
| **Receivables** | VaR<br>Interest Rate Sensitivity |
| **Financial instruments owned** | VaR<br>10% Sensitivity Measures<br>Credit Spread Sensitivity — Derivatives |
| **Deposits, at fair value** | Credit Spread Sensitivity — Financial Liabilities |
| **Collateralized financings, at fair value** | VaR |
| **Financial instruments sold, but not yet purchased** | VaR<br>Credit Spread Sensitivity — Derivatives |
| **Unsecured short-term and long-term borrowings, at fair value** | VaR<br>Credit Spread Sensitivity — Financial Liabilities |

## Credit Risk Management

### Overview

Credit risk represents the potential for loss due to the default or deterioration in credit quality of a counterparty (e.g., an OTC derivatives counterparty or a borrower) or an issuer of securities or other instruments we hold. Our exposure to credit risk comes mostly from client transactions in OTC derivatives and loans and lending commitments. Credit risk also comes from cash placed with banks, securities financing transactions (i.e., resale and repurchase agreements and securities borrowing and lending activities) and customer and other receivables.

Credit Risk Management, which is independent of our revenue-producing units and reports to our chief risk officer, has primary responsibility for assessing, monitoring and managing our credit risk through firmwide oversight across our global businesses. The Risk Governance Committee reviews and approves credit policies and parameters. In addition, we hold other positions that give rise to credit risk (e.g., bonds held in our inventory and secondary bank loans). These credit risks are captured as a component of market risk measures, which are monitored and managed by Market Risk Management, consistent with other inventory positions. We also enter into derivatives to manage market risk exposures. Such derivatives also give rise to credit risk, which is monitored and managed by Credit Risk Management.

### Credit Risk Management Process

Our process for managing credit risk includes:

- Collecting complete, accurate and timely information;
- Approving transactions and setting and communicating credit exposure limits;
- Monitoring compliance with established credit risk limits and reporting our exposure;
- Establishing or approving underwriting standards;
- Assessing the likelihood that a counterparty will default on its payment obligations;
- Measuring our current and potential credit exposure and losses resulting from counterparty default;
- Using credit risk mitigants, including collateral and hedging;
- Maximizing recovery through active workout and restructuring of claims; and
- Proactive communication between our revenue-producing units and our independent risk oversight and control functions.

As part of the risk assessment process, Credit Risk Management performs credit reviews, which include initial and ongoing analyses of our counterparties. For substantially all of our credit exposures, the core of our process is an annual counterparty credit review. A credit review is an independent analysis of the capacity and willingness of a counterparty to meet its financial obligations, resulting in an internal credit rating. The determination of internal credit ratings also incorporates assumptions with respect to the nature of and outlook for the counterparty's industry, and the economic environment. Senior personnel within Credit Risk Management, with expertise in specific industries, inspect and approve credit reviews and internal credit ratings.

Our risk assessment process may also include, where applicable, reviewing certain key metrics, including, but not limited to, delinquency status, collateral values, Fair Isaac Corporation credit scores and other risk factors.

Our global credit risk management systems capture credit exposure to individual counterparties and on an aggregate basis to counterparties and their subsidiaries (economic groups). These systems also provide management with comprehensive information about our aggregate credit risk by product, internal credit rating, industry, country and region.

### Risk Measures and Limits

We measure our credit risk based on the potential loss in the event of non-payment by a counterparty using current and potential exposure. For derivatives and securities financing transactions, current exposure represents the amount presently owed to us after taking into account applicable netting and collateral arrangements, while potential exposure represents our estimate of the future exposure that could arise over the life of a transaction based on market movements within a specified confidence level. Potential exposure also takes into account netting and collateral arrangements. For loans and lending commitments, the primary measure is a function of the notional amount of the position.

The Risk Committee of the Board and the Risk Governance Committee approve credit risk limits at firmwide, business and product levels, consistent with our risk appetite statement. Credit Risk Management (through delegated authority from the Risk Governance Committee) sets credit limits for individual counterparties, economic groups, industries and countries. Policies authorized by the Firmwide Enterprise Risk Committee and the Risk Governance Committee prescribe the level of formal approval required for us to assume credit exposure to a counterparty across all product areas, taking into account any applicable netting provisions, collateral or other credit risk mitigants.

We use credit limits at various levels (e.g., counterparty, economic group, industry and country), as well as underwriting standards to control the size and nature of our credit exposures. Limits for counterparties and economic groups are reviewed regularly and revised to reflect changing risk appetites for a given counterparty or group of counterparties. Limits for industries and countries are based on our risk appetite and are designed to allow for regular monitoring, review, escalation and management of credit risk concentrations.

Our credit risk limits are monitored by Credit Risk Management, which is responsible for identifying and escalating, on a timely basis, instances where limits have been exceeded. When a risk limit has been exceeded, it is escalated to senior management and/or the appropriate risk committee.

### Stress Tests

We use regular stress tests to calculate the credit exposures, including potential concentrations that would result from applying shocks to counterparty credit ratings or credit risk factors (e.g., currency rates, interest rates, equity prices). These shocks include a wide range of moderate and more extreme market movements. Some of our stress tests include shocks to multiple risk factors, consistent with the occurrence of a severe market or economic event. In the case of sovereign default, we estimate the direct impact of the default on our sovereign credit exposures, changes to our credit exposures arising from potential market moves in response to the default, and the impact of credit market deterioration on corporate borrowers and counterparties that may result from the sovereign default. Unlike potential exposure, which is calculated within a specified confidence level, with a stress test there is generally no assumed probability of these events occurring.

We perform stress tests on a regular basis as part of our routine risk management processes and conduct tailored stress tests on an ad hoc basis in response to market developments. We also perform stress tests that are designed to ensure a comprehensive analysis of our vulnerabilities and idiosyncratic risks combining financial and nonfinancial risks, including, but not limited to, credit, market, liquidity and funding, operational and compliance, strategic, systemic and emerging risks into a single combined scenario.

### Model Review and Validation

Our potential credit exposure and stress testing models, and any changes to such models or assumptions, are independently reviewed, validated and approved by Model Risk Management. See "Model Risk Management" for further information.

### Risk Mitigants

To reduce our credit exposures on derivatives and securities financing transactions, we may enter into netting agreements with counterparties that permit us to offset receivables and payables with such counterparties. We may also reduce credit risk with counterparties by entering into agreements that enable us to obtain collateral from them on an upfront or contingent basis and/or to terminate transactions if the counterparty's credit rating falls below a specified level. We monitor the fair value of the collateral to ensure that our credit exposures are appropriately collateralized. We seek to minimize exposures where there is a significant positive correlation between the creditworthiness of our counterparties and the market value of collateral we receive.

For loans and lending commitments, depending on the credit quality of the borrower and other characteristics of the transaction, we employ a variety of potential risk mitigants. Risk mitigants include collateral provisions, guarantees, covenants, structural seniority of the bank loan claims and, for certain lending commitments, provisions in the legal documentation that allow us to adjust loan amounts, pricing, structure and other terms as market conditions change. The type and structure of risk mitigants employed can significantly influence the degree of credit risk involved in a loan or lending commitment.

When we do not have sufficient visibility into a counterparty's financial strength or when we believe a counterparty requires support from its parent, we may obtain third-party guarantees of the counterparty's obligations. We may also mitigate our credit risk using credit derivatives or participation agreements.

### Credit Exposures

As of December 2018, our aggregate credit exposure increased as compared with December 2017, primarily reflecting an increase in cash deposits with central banks and loans and lending commitments, partially offset by a decrease in secured financing transactions. The percentage of our credit exposures arising from non-investment-grade counterparties (based on our internally determined public rating agency equivalents) increased as compared with December 2017, reflecting an increase in non-investment-grade loans and lending commitments. Our credit exposure to counterparties that defaulted during 2018 was lower as compared with our credit exposure to counterparties that defaulted during the prior year, and substantially all of such exposure was related to loans and lending commitments. Our credit exposure to counterparties that defaulted during 2018 remained low, representing less than 0.5% of our total credit exposure, and estimated losses compared with the prior year were lower and not material. Our credit exposures are described further below.

**Cash and Cash Equivalents.** Our credit exposure on cash and cash equivalents arises from our unrestricted cash, and includes both interest-bearing and non-interest-bearing deposits. To mitigate the risk of credit loss, we place substantially all of our deposits with highly rated banks and central banks.

The table below presents credit exposure from unrestricted cash and cash equivalents, and the concentration by industry, region and credit quality.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Cash and Cash Equivalents** | **$107,408** | $91,609 |
| **Industry** | | |
| Financial Institutions | **16%** | 17% |
| Sovereign | **84%** | 83% |
| **Total** | **100%** | 100% |
| **Region** | | |
| Americas | **36%** | 64% |
| Europe, Middle East and Africa | **41%** | 22% |
| Asia | **23%** | 14% |
| **Total** | **100%** | 100% |
| **Credit Quality (Credit Rating Equivalent)** | | |
| AAA | **62%** | 72% |
| AA | **10%** | 9% |
| A | **27%** | 18% |
| BBB | **1%** | 1% |
| **Total** | **100%** | 100% |

The table above excludes cash segregated for regulatory and other purposes of $23.14 billion as of December 2018 and $18.44 billion as of December 2017.

**OTC Derivatives.** Our credit exposure on OTC derivatives arises primarily from our market-making activities. As a market maker, we enter into derivative transactions to provide liquidity to clients and to facilitate the transfer and hedging of their risks. We also enter into derivatives to manage market risk exposures. We manage our credit exposure on OTC derivatives using the credit risk process, measures, limits and risk mitigants described above.

We generally enter into OTC derivatives transactions under bilateral collateral arrangements that require the daily exchange of collateral. As credit risk is an essential component of fair value, we include a credit valuation adjustment (CVA) in the fair value of derivatives to reflect counterparty credit risk, as described in Note 7 to the consolidated financial statements. CVA is a function of the present value of expected exposure, the probability of counterparty default and the assumed recovery upon default.

The table below presents net credit exposure from OTC derivatives and the concentration by industry and region.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| OTC derivative assets | **$ 40,576** | $ 45,036 |
| Collateral (not netted under U.S. GAAP) | **(14,278)** | (15,422) |
| **Net credit exposure** | **$ 26,298** | $ 29,614 |
| **Industry** | | |
| Consumer, Retail & Healthcare | **2%** | 3% |
| Diversified Industrials | **8%** | 7% |
| Financial Institutions | **14%** | 16% |
| Funds | **17%** | 14% |
| Municipalities & Nonprofit | **7%** | 8% |
| Natural Resources & Utilities | **13%** | 14% |
| Sovereign | **25%** | 24% |
| Technology, Media & Telecommunications | **7%** | 7% |
| Other (including Special Purpose Vehicles) | **7%** | 7% |
| **Total** | **100%** | 100% |
| **Region** | | |
| Americas | **35%** | 41% |
| Europe, Middle East and Africa | **55%** | 51% |
| Asia | **10%** | 8% |
| **Total** | **100%** | 100% |

In the table above:

- OTC derivative assets, included in the consolidated statements of financial condition, are reported on a net-by-counterparty basis (i.e., the net receivable for a given counterparty) when a legal right of setoff exists under an enforceable netting agreement (counterparty netting) and are accounted for at fair value, net of cash collateral received under enforceable credit support agreements (cash collateral netting).
- Collateral represents cash collateral and the fair value of securities collateral, primarily U.S. and non-U.S. government and agency obligations, received under credit support agreements, which management considers when determining credit risk, but such collateral is not eligible for netting under U.S. GAAP.

The table below presents the distribution of net credit exposure from OTC derivatives by tenor.

| *$ in millions* | Investment-Grade | Non-Investment-Grade / Unrated | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| Less than 1 year | **$ 15,697** | **$ 5,427** | **$ 21,124** |
| 1 - 5 years | **21,300** | **4,091** | **25,391** |
| Greater than 5 years | **51,737** | **4,191** | **55,928** |
| Total | **88,734** | **13,709** | **102,443** |
| Netting | **(68,736)** | **(7,409)** | **(76,145)** |
| **Net credit exposure** | **$ 19,998** | **$ 6,300** | **$ 26,298** |
| As of December 2017 | | | |
| Less than 1 year | $ 16,232 | $ 4,854 | $ 21,086 |
| 1 - 5 years | 23,817 | 5,465 | 29,282 |
| Greater than 5 years | 62,103 | 4,441 | 66,544 |
| Total | 102,152 | 14,760 | 116,912 |
| Netting | (79,786) | (7,512) | (87,298) |
| Net credit exposure | $ 22,366 | $ 7,248 | $ 29,614 |

In the table above:

- Tenor is based on remaining contractual maturity.
- Netting includes counterparty netting across tenor categories and cash and securities collateral that management considers when determining credit risk (including collateral that is not eligible for netting under U.S. GAAP). Counterparty netting within the same tenor category is included within such tenor category.

The tables below present the distribution of net credit exposure from OTC derivatives by tenor and internally determined public rating agency equivalents.

| | Investment-Grade | | | | |
|---|---|---|---|---|---|
| *$ in millions* | AAA | AA | A | BBB | Total |
| **As of December 2018** | | | | | |
| Less than 1 year | **$ 1,262** | **$ 2,506** | **$ 6,473** | **$ 5,456** | **$ 15,697** |
| 1 - 5 years | **881** | **5,192** | **9,072** | **6,155** | **21,300** |
| Greater than 5 years | **9,202** | **3,028** | **21,415** | **18,092** | **51,737** |
| Total | **11,345** | **10,726** | **36,960** | **29,703** | **88,734** |
| Netting | **(6,444)** | **(7,107)** | **(32,390)** | **(22,795)** | **(68,736)** |
| **Net credit exposure** | **$ 4,901** | **$ 3,619** | **$ 4,570** | **$ 6,908** | **$ 19,998** |
| As of December 2017 | | | | | |
| Less than 1 year | $ 663 | $ 3,028 | $ 7,806 | $ 4,735 | $ 16,232 |
| 1 - 5 years | 1,231 | 4,770 | 11,975 | 5,841 | 23,817 |
| Greater than 5 years | 3,263 | 16,990 | 21,857 | 19,993 | 62,103 |
| Total | 5,157 | 24,788 | 41,638 | 30,569 | 102,152 |
| Netting | (2,912) | (16,648) | (36,561) | (23,665) | (79,786) |
| Net credit exposure | $ 2,245 | $ 8,140 | $ 5,077 | $ 6,904 | $ 22,366 |

| | Non-Investment-Grade / Unrated | | |
|---|---|---|---|
| *$ in millions* | BB or lower | Unrated | Total |
| **As of December 2018** | | | |
| Less than 1 year | **$ 5,255** | **$ 172** | **$ 5,427** |
| 1 - 5 years | **4,053** | **38** | **4,091** |
| Greater than 5 years | **4,138** | **53** | **4,191** |
| Total | **13,446** | **263** | **13,709** |
| Netting | **(7,339)** | **(70)** | **(7,409)** |
| **Net credit exposure** | **$ 6,107** | **$ 193** | **$ 6,300** |
| As of December 2017 | | | |
| Less than 1 year | $ 4,603 | $ 251 | $ 4,854 |
| 1 - 5 years | 5,458 | 7 | 5,465 |
| Greater than 5 years | 4,401 | 40 | 4,441 |
| Total | 14,462 | 298 | 14,760 |
| Netting | (7,418) | (94) | (7,512) |
| Net credit exposure | $ 7,044 | $ 204 | $ 7,248 |

**Lending Activities.** We manage our lending activities using the credit risk process, measures, limits and risk mitigants described above. Other lending positions, including secondary trading positions, are risk-managed as a component of market risk.

- **Commercial Lending.** Our commercial lending activities include lending to investment-grade and non-investment-grade corporate borrowers. Loans and lending commitments associated with these activities are principally used for operating liquidity and general corporate purposes or in connection with contingent acquisitions. Corporate loans may be secured or unsecured, depending on the loan purpose, the risk profile of the borrower and other factors. Our commercial lending activities also include extending loans to borrowers that are secured by commercial and other real estate.

  The table below presents credit exposure from commercial loans and lending commitments, and the concentration by industry, region and credit quality.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Loans and Lending Commitments** | **$200,823** | $198,012 |
| **Industry** | | |
| Consumer, Retail & Healthcare | **16%** | 23% |
| Diversified Industrials | **16%** | 13% |
| Financial Institutions | **9%** | 7% |
| Funds | **4%** | 3% |
| Natural Resources & Utilities | **15%** | 14% |
| Real Estate | **10%** | 12% |
| Technology, Media & Telecommunications | **18%** | 19% |
| Other (including Special Purpose Vehicles) | **12%** | 9% |
| **Total** | **100%** | 100% |
| **Region** | | |
| Americas | **76%** | 73% |
| Europe, Middle East and Africa | **20%** | 24% |
| Asia | **4%** | 3% |
| **Total** | **100%** | 100% |
| **Credit Quality (Credit Rating Equivalent)** | | |
| AAA | **1%** | 2% |
| AA | **5%** | 4% |
| A | **14%** | 17% |
| BBB | **29%** | 32% |
| BB or lower | **51%** | 45% |
| **Total** | **100%** | 100% |

- **PWM, Residential Real Estate and Other Lending.** We extend PWM loans and lending commitments through our private bank that are secured by residential real estate, securities or other assets. The fair value of the collateral received against such loans and lending commitments generally exceeds their carrying value.

  We also have residential real estate and other lending exposures, which includes purchased residential real estate and unsecured consumer loans and commitments to purchase such loans (including distressed loans) and securities.

The table below presents credit exposure from PWM, residential real estate and other lending, and the concentration by region.

| *$ in millions* | PWM | Residential Real Estate and Other |
|---|---|---|
| **As of December 2018** | | |
| **Credit Exposure** | **$26,152** | **$12,599** |
| Americas | **91%** | **73%** |
| Europe, Middle East and Africa | **7%** | **26%** |
| Asia | **2%** | **1%** |
| **Total** | **100%** | **100%** |
| As of December 2017 | | |
| Credit Exposure | $24,855 | $10,242 |
| Americas | 90% | 74% |
| Europe, Middle East and Africa | 5% | 26% |
| Asia | 5% | – |
| Total | 100% | 100% |

- **Consumer Lending.** We originate unsecured consumer loans.

  The table below presents credit exposure from originated unsecured consumer loans and the concentration for the five most concentrated U.S. states.

| *$ in millions* | Consumer |
|---|---|
| **As of December 2018** | |
| **Credit Exposure** | **$4,536** |
| California | **12%** |
| Texas | **9%** |
| New York | **7%** |
| Florida | **7%** |
| Illinois | **4%** |
| Other | **61%** |
| **Total** | **100%** |
| As of December 2017 | |
| Credit Exposure | $1,912 |
| California | 11% |
| Texas | 10% |
| New York | 7% |
| Florida | 7% |
| Illinois | 4% |
| Other | 61% |
| Total | 100% |

See Note 9 to the consolidated financial statements for further information about the credit quality indicators of consumer loans.

**Securities Financing Transactions.** We enter into securities financing transactions in order to, among other things, facilitate client activities, invest excess cash, acquire securities to cover short positions and finance certain activities. We bear credit risk related to resale agreements and securities borrowed only to the extent that cash advanced or the value of securities pledged or delivered to the counterparty exceeds the value of the collateral received. We also have credit exposure on repurchase agreements and securities loaned to the extent that the value of securities pledged or delivered to the counterparty for these transactions exceeds the amount of cash or collateral received. Securities collateral obtained for securities financing transactions primarily includes U.S. and non-U.S. government and agency obligations.

The table below presents credit exposure from secured financing transactions and the concentration by industry, region and credit quality.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Secured Financing Transactions** | **$20,979** | $29,071 |
| **Industry** | | |
| Financial Institutions | **31%** | 29% |
| Funds | **33%** | 28% |
| Municipalities & Nonprofit | **7%** | 6% |
| Sovereign | **28%** | 36% |
| Other (including Special Purpose Vehicles) | **1%** | 1% |
| **Total** | **100%** | 100% |
| **Region** | | |
| Americas | **33%** | 30% |
| Europe, Middle East and Africa | **41%** | 46% |
| Asia | **26%** | 24% |
| **Total** | **100%** | 100% |
| **Credit Quality (Credit Rating Equivalent)** | | |
| AAA | **11%** | 12% |
| AA | **34%** | 33% |
| A | **35%** | 35% |
| BBB | **10%** | 10% |
| BB or lower | **10%** | 10% |
| **Total** | **100%** | 100% |

The table above reflects both netting agreements and collateral that management considers when determining credit risk.

**Other Credit Exposures.** We are exposed to credit risk from our receivables from brokers, dealers and clearing organizations and customers and counterparties. Receivables from brokers, dealers and clearing organizations primarily consist of initial margin placed with clearing organizations and receivables related to sales of securities which have traded, but not yet settled. These receivables generally have minimal credit risk due to the low probability of clearing organization default and the short-term nature of receivables related to securities settlements. Receivables from customers and counterparties generally consist of collateralized receivables related to customer securities transactions and generally have minimal credit risk due to both the value of the collateral received and the short-term nature of these receivables.

The table below presents other credit exposures and the concentration by industry, region and credit quality.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Other Credit Exposures** | **$41,649** | $34,323 |
| **Industry** | | |
| Financial Institutions | **84%** | 88% |
| Funds | **7%** | 6% |
| Natural Resources & Utilities | **4%** | 3% |
| Other (including Special Purpose Vehicles) | **5%** | 3% |
| **Total** | **100%** | 100% |
| **Region** | | |
| Americas | **44%** | 41% |
| Europe, Middle East and Africa | **46%** | 49% |
| Asia | **10%** | 10% |
| **Total** | **100%** | 100% |
| **Credit Quality (Credit Rating Equivalent)** | | |
| AAA | **3%** | 3% |
| AA | **47%** | 51% |
| A | **26%** | 27% |
| BBB | **8%** | 7% |
| BB or lower | **16%** | 12% |
| **Total** | **100%** | 100% |

The table above reflects collateral that management considers when determining credit risk.

## Selected Exposures

We have credit and market exposures, as described below, that have had heightened focus due to recent events and broad market concerns. Credit exposure represents the potential for loss due to the default or deterioration in credit quality of a counterparty or borrower. Market exposure represents the potential for loss in value of our long and short inventory due to changes in market prices.

The international sanctions on Russia have led to concerns about its economic stability. As of December 2018, our total credit exposure to Russia was $371 million, which was primarily with non-sovereign counterparties or borrowers, and was primarily related to loans and lending commitments. In addition, our total market exposure to Russia as of December 2018 was $502 million, reflecting equity exposure with non-sovereign issuers or underliers.

The potential restructuring of Lebanon's sovereign debt has led to concerns about its financial stability. As of December 2018, our credit exposure to Lebanon was $570 million, substantially all of which related to loans and lending commitments with non-sovereign borrowers. After taking into consideration the benefit of cash and Lebanese securities collateral held, our net credit exposure was not material. In addition, our total market exposure to Lebanon as of December 2018 was not material.

The debt crisis in Mozambique has resulted in credit rating downgrades and political instability in Ukraine has led to economic concerns. In addition, Venezuela has delayed payments on its sovereign debt and its political situation remains unclear. As of December 2018, our total credit and market exposure to each of Mozambique, Ukraine and Venezuela was not material.

We have a comprehensive framework to monitor, measure and assess our country exposures and to determine our risk appetite. We determine the country of risk by the location of the counterparty, issuer or underlier's assets, where they generate revenue, the country in which they are headquartered, the jurisdiction where a claim against them could be enforced, and/or the government whose policies affect their ability to repay their obligations. We monitor our credit exposure to a specific country both at the individual counterparty level, as well as at the aggregate country level.

We use regular stress tests, described above, to calculate the credit exposures, including potential concentrations that would result from applying shocks to counterparty credit ratings or credit risk factors. To supplement these regular stress tests, we also conduct tailored stress tests on an ad hoc basis in response to specific market events that we deem significant. These stress tests are designed to estimate the direct impact of the event on our credit and market exposures resulting from shocks to risk factors including, but not limited to, currency rates, interest rates, and equity prices. We also utilize these stress tests to estimate the indirect impact of certain hypothetical events on our country exposures, such as the impact of credit market deterioration on corporate borrowers and counterparties along with the shocks to the risk factors described above. The parameters of these shocks vary based on the scenario reflected in each stress test. We review estimated losses produced by the stress tests in order to understand their magnitude, highlight potential loss concentrations, and assess and mitigate our exposures where necessary.

See "Stress Tests" above, "Liquidity Risk Management — Stress Tests" and "Market Risk Management — Risk Measures — Stress Testing" for further information about stress tests.

## Operational Risk Management

### Overview

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes, people, systems or from external events. Our exposure to operational risk arises from routine processing errors, as well as extraordinary incidents, such as major systems failures or legal and regulatory matters.

Potential types of loss events related to internal and external operational risk include:

- Clients, products and business practices;
- Execution, delivery and process management;
- Business disruption and system failures;
- Employment practices and workplace safety;
- Damage to physical assets;
- Internal fraud; and
- External fraud.

We maintain a comprehensive control framework designed to provide a well-controlled environment to minimize operational risks. The Firmwide Conduct and Operational Risk Committee is globally responsible for the ongoing approval and monitoring of the frameworks, policies, parameters, limits and thresholds which govern our operational risks.

Operational Risk Management, which is independent of our revenue-producing units and reports to our chief risk officer, has primary responsibility for developing and implementing a formalized framework for assessing, monitoring and managing operational risk with the goal of maintaining our exposure to operational risk at levels that are within our risk appetite.

### Operational Risk Management Process

Our process for managing operational risk includes:

- Collecting complete, accurate and timely information;
- Training, supervision and development of our people;
- Active participation of senior management in identifying and mitigating our key operational risks;
- Independent risk oversight and control functions that monitor operational risk, and implementation of policies and procedures, and controls designed to prevent the occurrence of operational risk events; and
- Proactive communication between our revenue-producing units and our independent risk oversight and control functions.

We combine top-down and bottom-up approaches to manage and measure operational risk. From a top-down perspective, our senior management assesses firmwide and business-level operational risk profiles. From a bottom-up perspective, our first and second lines of defense are responsible for risk identification and risk management on a day-to-day basis, including escalating operational risks to senior management.

Our operational risk management framework is in part designed to comply with the operational risk measurement rules under the Capital Framework and has evolved based on the changing needs of our businesses and regulatory guidance.

Our operational risk management framework consists of the following practices:

- Risk identification and assessment;
- Risk measurement; and
- Risk monitoring and reporting.

### Risk Identification and Assessment

The core of our operational risk management framework is risk identification and assessment. We have a comprehensive data collection process, including firmwide policies and procedures, for operational risk events.

We have established policies that require all employees to report and escalate operational risk events. When operational risk events are identified, our policies require that the events be documented and analyzed to determine whether changes are required in our systems and/or processes to further mitigate the risk of future events.

We use operational risk management applications to capture and organize operational risk event data and key metrics. One of our key risk identification and assessment tools is an operational risk and control self-assessment process, which is performed by our managers. This process consists of the identification and rating of operational risks, on a forward-looking basis, and the related controls. The results from this process are analyzed to evaluate operational risk exposures and identify businesses, activities or products with heightened levels of operational risk.

### Risk Measurement

We measure our operational risk exposure using both statistical modeling and scenario analyses, which involve qualitative and quantitative assessments of internal and external operational risk event data and internal control factors for each of our businesses. Operational risk measurement also incorporates an assessment of business environment factors, including, but not limited to:

- Evaluations of the complexity of our business activities;
- The degree of automation in our processes;
- New activity information;
- The legal and regulatory environment; and
- Changes in the markets for our products and services, including the diversity and sophistication of our customers and counterparties.

The results from these scenario analyses are used to monitor changes in operational risk and to determine business lines that may have heightened exposure to operational risk. These analyses are used in the determination of the appropriate level of operational risk capital to hold.

### Stress Tests

We perform stress tests on a regular basis as part of our routine risk management processes. We also perform stress tests that are designed to ensure a comprehensive analysis of our vulnerabilities and idiosyncratic risks combining financial and nonfinancial risks, including, but not limited to, credit, market, liquidity and funding, operational and compliance, strategic, systemic and emerging risks into a single combined scenario.

### Risk Monitoring and Reporting

We evaluate changes in our operational risk profile and our businesses, including changes in business mix or jurisdictions in which we operate, by monitoring the factors noted above at a firmwide level. We have both preventive and detective internal controls, which are designed to reduce the frequency and severity of operational risk losses and the probability of operational risk events. We monitor the results of assessments and independent internal audits of these internal controls.

We have established limits and thresholds consistent with our risk appetite statement that are approved by the Risk Committee of the Board, as well as escalation protocols. Our operational risk limits and thresholds are monitored by Operational Risk Management. Operational Risk Management is responsible for identifying and escalating to senior management and/or the appropriate risk committee, on a timely basis, instances where limits and thresholds have been exceeded.

### Model Review and Validation

The statistical models utilized by Operational Risk Management are independently reviewed, validated and approved by Model Risk Management. See "Model Risk Management" for further information.

## Model Risk Management

### Overview

Model risk is the potential for adverse consequences from decisions made based on model outputs that may be incorrect or used inappropriately. We rely on quantitative models across our business activities primarily to value certain financial assets and financial liabilities, to monitor and manage our risk, and to measure and monitor our regulatory capital.

Our model risk management framework is managed through a governance structure and risk management controls, which encompass standards designed to ensure we maintain a comprehensive model inventory, including risk assessment and classification, sound model development practices, independent review and model-specific usage controls. The Firmwide Model Risk Control Committee oversees our model risk management framework.

Model Risk Management, which is independent of our revenue-producing units, model developers, model owners and model users, and reports to our chief risk officer, has primary responsibility for assessing, monitoring and managing our model risk through firmwide oversight across our global businesses, and provides periodic updates to senior management, risk committees and the Risk Committee of the Board.

### Model Review and Validation Process

Model Risk Management consists of quantitative professionals who perform an independent review, validation and approval of our models. This review includes an analysis of the model documentation, independent testing, an assessment of the appropriateness of the methodology used, and verification of compliance with model development and implementation standards. Model Risk Management reviews all existing models on an annual basis, and approves new models or significant changes to models prior to implementation.

The model validation process incorporates a review of models and trade and risk parameters across a broad range of scenarios (including extreme conditions) in order to critically evaluate and verify:

- The model's conceptual soundness, including the reasonableness of model assumptions, and suitability for intended use;
- The testing strategy utilized by the model developers to ensure that the models function as intended;
- The suitability of the calculation techniques incorporated in the model;
- The model's accuracy in reflecting the characteristics of the related product and its significant risks;
- The model's consistency with models for similar products; and
- The model's sensitivity to input parameters and assumptions.

See "Critical Accounting Policies — Fair Value — Review of Valuation Models," "Liquidity Risk Management," "Market Risk Management," "Credit Risk Management" and "Operational Risk Management" for further information about our use of models within these areas.

# Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Quantitative and qualitative disclosures about market risk are set forth in "Management's Discussion and Analysis of Financial Condition and Results of Operations — Risk Management" in Part II, Item 7 of this Form 10-K.

# Item 8. Financial Statements and Supplementary Data

## Management's Report on Internal Control over Financial Reporting

Management of The Goldman Sachs Group, Inc., together with its consolidated subsidiaries (the firm), is responsible for establishing and maintaining adequate internal control over financial reporting. The firm's internal control over financial reporting is a process designed under the supervision of the firm's principal executive and principal financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the firm's financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

As of December 31, 2018, management conducted an assessment of the firm's internal control over financial reporting based on the framework established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management has determined that the firm's internal control over financial reporting as of December 31, 2018 was effective.

Our internal control over financial reporting includes policies and procedures that pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of assets; provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with authorizations of management and the directors of the firm; and provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the firm's assets that could have a material effect on our financial statements.

The firm's internal control over financial reporting as of December 31, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report appearing on page 103, which expresses an unqualified opinion on the effectiveness of the firm's internal control over financial reporting as of December 31, 2018.

# Report of Independent Registered Public Accounting Firm

To the Board of Directors and the Shareholders of The Goldman Sachs Group, Inc.:

### *Opinions on the Financial Statements and Internal Control over Financial Reporting*

We have audited the accompanying consolidated statements of financial condition of The Goldman Sachs Group, Inc. and its subsidiaries (the Company) as of December 31, 2018 and 2017, and the related consolidated statements of earnings, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of 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 accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the COSO.

### *Basis for Opinions*

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing on page 102. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

### *Definition and Limitations of Internal Control over Financial Reporting*

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PRICEWATERHOUSECOOPERS LLP

New York, New York
February 25, 2019

We have served as the Company's auditor since 1922.

# Consolidated Statements of Earnings

| | Year Ended December | | |
|---|---|---|---|
| *in millions, except per share amounts* | **2018** | 2017 | 2016 |
| **Revenues** | | | |
| Investment banking | **$ 7,862** | $ 7,371 | $ 6,273 |
| Investment management | **6,514** | 5,803 | 5,407 |
| Commissions and fees | **3,199** | 3,051 | 3,208 |
| Market making | **9,451** | 7,660 | 9,933 |
| Other principal transactions | **5,823** | 5,913 | 3,382 |
| Total non-interest revenues | **32,849** | 29,798 | 28,203 |
| Interest income | **19,679** | 13,113 | 9,691 |
| Interest expense | **15,912** | 10,181 | 7,104 |
| Net interest income | **3,767** | 2,932 | 2,587 |
| Total net revenues | **36,616** | 32,730 | 30,790 |
| Provision for credit losses | **674** | 657 | 182 |
| **Operating expenses** | | | |
| Compensation and benefits | **12,328** | 11,653 | 11,448 |
| Brokerage, clearing, exchange and distribution fees | **3,200** | 2,876 | 2,823 |
| Market development | **740** | 588 | 457 |
| Communications and technology | **1,023** | 897 | 809 |
| Depreciation and amortization | **1,328** | 1,152 | 998 |
| Occupancy | **809** | 733 | 788 |
| Professional fees | **1,214** | 1,165 | 1,081 |
| Other expenses | **2,819** | 1,877 | 1,900 |
| Total operating expenses | **23,461** | 20,941 | 20,304 |
| Pre-tax earnings | **12,481** | 11,132 | 10,304 |
| Provision for taxes | **2,022** | 6,846 | 2,906 |
| Net earnings | **10,459** | 4,286 | 7,398 |
| Preferred stock dividends | **599** | 601 | 311 |
| **Net earnings applicable to common shareholders** | **$ 9,860** | $ 3,685 | $ 7,087 |
| **Earnings per common share** | | | |
| Basic | **$ 25.53** | $ 9.12 | $ 16.53 |
| Diluted | **$ 25.27** | $ 9.01 | $ 16.29 |
| **Average common shares** | | | |
| Basic | **385.4** | 401.6 | 427.4 |
| Diluted | **390.2** | 409.1 | 435.1 |

# Consolidated Statements of Comprehensive Income

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Net earnings | **$10,459** | $ 4,286 | $ 7,398 |
| Other comprehensive income/(loss) adjustments, net of tax: | | | |
| Currency translation | **4** | 22 | (60) |
| Debt valuation adjustment | **2,553** | (807) | (544) |
| Pension and postretirement liabilities | **119** | 130 | (199) |
| Available-for-sale securities | **(103)** | (9) | – |
| Other comprehensive income/(loss) | **2,573** | (664) | (803) |
| **Comprehensive income** | **$13,032** | $ 3,622 | $ 6,595 |

The accompanying notes are an integral part of these consolidated financial statements.

# Consolidated Statements of Financial Condition

| *$ in millions* | As of December 2018 | 2017 |
| --- | --- | --- |
| **Assets** | | |
| Cash and cash equivalents | **$130,547** | $110,051 |
| Collateralized agreements: | | |
| Securities purchased under agreements to resell (includes **$139,220** and $120,420 at fair value) | **139,258** | 120,822 |
| Securities borrowed (includes **$23,142** and $78,189 at fair value) | **135,285** | 190,848 |
| Receivables: | | |
| Loans receivable | **80,590** | 65,933 |
| Customer and other receivables (includes **$3,189** and $3,526 at fair value) | **79,315** | 84,788 |
| Financial instruments owned (at fair value and includes **$55,081** and $50,335 pledged as collateral) | **336,161** | 315,988 |
| Other assets | **30,640** | 28,346 |
| **Total assets** | **$931,796** | $916,776 |
| **Liabilities and shareholders' equity** | | |
| Deposits (includes **$21,060** and $22,902 at fair value) | **$158,257** | $138,604 |
| Collateralized financings: | | |
| Securities sold under agreements to repurchase (at fair value) | **78,723** | 84,718 |
| Securities loaned (includes **$3,241** and $5,357 at fair value) | **11,808** | 14,793 |
| Other secured financings (includes **$20,904** and $24,345 at fair value) | **21,433** | 24,788 |
| Customer and other payables | **180,235** | 178,169 |
| Financial instruments sold, but not yet purchased (at fair value) | **108,897** | 111,930 |
| Unsecured short-term borrowings (includes **$16,963** and $16,904 at fair value) | **40,502** | 46,922 |
| Unsecured long-term borrowings (includes **$46,584** and $38,638 at fair value) | **224,149** | 217,687 |
| Other liabilities (includes **$132** and $268 at fair value) | **17,607** | 16,922 |
| Total liabilities | **841,611** | 834,533 |
| **Commitments, contingencies and guarantees** | | |
| **Shareholders' equity** | | |
| Preferred stock; aggregate liquidation preference of **$11,203** and $11,853 | **11,203** | 11,853 |
| Common stock; **891,356,284** and 884,592,863 shares issued, and **367,741,973** and 374,808,805 shares outstanding | **9** | 9 |
| Share-based awards | **2,845** | 2,777 |
| Nonvoting common stock; no shares issued and outstanding | **–** | – |
| Additional paid-in capital | **54,005** | 53,357 |
| Retained earnings | **100,100** | 91,519 |
| Accumulated other comprehensive income/(loss) | **693** | (1,880) |
| Stock held in treasury, at cost; **523,614,313** and 509,784,060 shares | **(78,670)** | (75,392) |
| Total shareholders' equity | **90,185** | 82,243 |
| **Total liabilities and shareholders' equity** | **$931,796** | $916,776 |

The accompanying notes are an integral part of these consolidated financial statements.

# Consolidated Statements of Changes in Shareholders' Equity

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Preferred stock** | | | |
| Beginning balance | **$ 11,853** | $ 11,203 | $ 11,200 |
| Issued | **–** | 1,500 | 1,325 |
| Redeemed | **(650)** | (850) | (1,322) |
| Ending balance | **11,203** | 11,853 | 11,203 |
| **Common stock** | | | |
| Beginning balance | **9** | 9 | 9 |
| Issued | **–** | – | – |
| Ending balance | **9** | 9 | 9 |
| **Share-based awards** | | | |
| Beginning balance, as previously reported | **2,777** | 3,914 | 4,151 |
| Cumulative effect of change in accounting principle for forfeiture of share-based awards | **–** | 35 | – |
| Beginning balance, adjusted | **2,777** | 3,949 | 4,151 |
| Issuance and amortization of share-based awards | **1,355** | 1,810 | 2,143 |
| Delivery of common stock underlying share-based awards | **(1,175)** | (2,704) | (2,068) |
| Forfeiture of share-based awards | **(80)** | (89) | (102) |
| Exercise of share-based awards | **(32)** | (189) | (210) |
| Ending balance | **2,845** | 2,777 | 3,914 |
| **Additional paid-in capital** | | | |
| Beginning balance | **53,357** | 52,638 | 51,340 |
| Delivery of common stock underlying share-based awards | **1,751** | 2,934 | 2,282 |
| Cancellation of share-based awards in satisfaction of withholding tax requirements | **(1,118)** | (2,220) | (1,121) |
| Preferred stock issuance costs, net of reversals upon redemption | **15** | 8 | (10) |
| Excess net tax benefit related to share-based awards | **–** | – | 147 |
| Cash settlement of share-based awards | **–** | (3) | – |
| Ending balance | **54,005** | 53,357 | 52,638 |
| **Retained earnings** | | | |
| Beginning balance, as previously reported | **91,519** | 89,039 | 83,386 |
| Cumulative effect of change in accounting principle for: | | | |
| Revenue recognition from contracts with clients, net of tax | **(53)** | – | – |
| Forfeiture of share-based awards, net of tax | **–** | (24) | – |
| Debt valuation adjustment, net of tax | **–** | – | (305) |
| Beginning balance, adjusted | **91,466** | 89,015 | 83,081 |
| Net earnings | **10,459** | 4,286 | 7,398 |
| Dividends and dividend equivalents declared on common stock and share-based awards | **(1,226)** | (1,181) | (1,129) |
| Dividends declared on preferred stock | **(584)** | (587) | (577) |
| Preferred stock redemption discount/(premium) | **(15)** | (14) | 266 |
| Ending balance | **100,100** | 91,519 | 89,039 |
| **Accumulated other comprehensive income/(loss)** | | | |
| Beginning balance, as previously reported | **(1,880)** | (1,216) | (718) |
| Cumulative effect of change in accounting principle for debt valuation adjustment, net of tax | **–** | – | 305 |
| Beginning balance, adjusted | **(1,880)** | (1,216) | (413) |
| Other comprehensive income/(loss) | **2,573** | (664) | (803) |
| Ending balance | **693** | (1,880) | (1,216) |
| **Stock held in treasury, at cost** | | | |
| Beginning balance | **(75,392)** | (68,694) | (62,640) |
| Repurchased | **(3,294)** | (6,721) | (6,069) |
| Reissued | **21** | 34 | 22 |
| Other | **(5)** | (11) | (7) |
| Ending balance | **(78,670)** | (75,392) | (68,694) |
| **Total shareholders' equity** | **$ 90,185** | $ 82,243 | $ 86,893 |

The accompanying notes are an integral part of these consolidated financial statements.

# Consolidated Statements of Cash Flows

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Cash flows from operating activities** | | | |
| Net earnings | **$ 10,459** | $ 4,286 | $ 7,398 |
| Adjustments to reconcile net earnings to net cash provided by/(used for) operating activities: | | | |
| Depreciation and amortization | **1,328** | 1,152 | 998 |
| Deferred income taxes | **(2,645)** | 5,458 | 551 |
| Share-based compensation | **1,831** | 1,769 | 2,111 |
| Loss/(gain) related to extinguishment of unsecured borrowings | **(160)** | (114) | 3 |
| Provision for credit losses | **674** | 657 | 182 |
| Changes in operating assets and liabilities: | | | |
| Customer and other receivables and payables, net | **7,186** | (30,136) | (14,723) |
| Collateralized transactions (excluding other secured financings), net | **28,147** | 10,025 | 78 |
| Financial instruments owned (excluding available-for-sale securities) | **(23,381)** | (11,843) | 13,662 |
| Financial instruments sold, but not yet purchased | **(3,670)** | (5,296) | 1,960 |
| Other, net | **652** | 5,815 | (5,726) |
| Net cash provided by/(used for) operating activities | **20,421** | (18,227) | 6,494 |
| **Cash flows from investing activities** | | | |
| Purchase of property, leasehold improvements and equipment | **(7,982)** | (3,184) | (2,865) |
| Proceeds from sales of property, leasehold improvements and equipment | **3,711** | 574 | 381 |
| Net cash acquired in/(used for) business acquisitions | **(162)** | (2,383) | 14,922 |
| Purchase of investments | **(3,790)** | (9,853) | – |
| Proceeds from sales and paydowns of investments | **411** | 2,900 | 1,517 |
| Loans receivable, net | **(14,865)** | (16,693) | (4,280) |
| Net cash provided by/(used for) investing activities | **(22,677)** | (28,639) | 9,675 |
| **Cash flows from financing activities** | | | |
| Unsecured short-term borrowings, net | **2,337** | (501) | (1,506) |
| Other secured financings (short-term), net | **586** | (405) | (808) |
| Proceeds from issuance of other secured financings (long-term) | **4,996** | 7,401 | 4,186 |
| Repayment of other secured financings (long-term), including the current portion | **(9,482)** | (4,726) | (7,375) |
| Purchase of APEX, senior guaranteed securities and trust preferred securities | **(35)** | (237) | (1,171) |
| Proceeds from issuance of unsecured long-term borrowings | **45,927** | 58,347 | 50,763 |
| Repayment of unsecured long-term borrowings, including the current portion | **(37,243)** | (30,748) | (36,556) |
| Derivative contracts with a financing element, net | **2,294** | 1,684 | 2,115 |
| Deposits, net | **20,206** | 14,506 | 10,058 |
| Preferred stock redemption | **(650)** | (850) | – |
| Common stock repurchased | **(3,294)** | (6,772) | (6,078) |
| Settlement of share-based awards in satisfaction of withholding tax requirements | **(1,118)** | (2,223) | (1,128) |
| Dividends and dividend equivalents paid on common stock, preferred stock and share-based awards | **(1,810)** | (1,769) | (1,706) |
| Proceeds from issuance of preferred stock, net of issuance costs | **–** | 1,495 | 1,303 |
| Proceeds from issuance of common stock, including exercise of share-based awards | **38** | 7 | 6 |
| Cash settlement of share-based awards | **–** | (3) | – |
| Net cash provided by financing activities | **22,752** | 35,206 | 12,103 |
| Net increase/(decrease) in cash and cash equivalents | **20,496** | (11,660) | 28,272 |
| Cash and cash equivalents, beginning balance | **110,051** | 121,711 | 93,439 |
| **Cash and cash equivalents, ending balance** | **$130,547** | $110,051 | $121,711 |

**SUPPLEMENTAL DISCLOSURES:**

Cash payments for interest, net of capitalized interest, were $16.72 billion for 2018, $11.17 billion for 2017 and $7.14 billion for 2016, and cash payments for income taxes, net of refunds, were $1.27 billion for 2018, $1.42 billion for 2017 and $1.06 billion for 2016. Cash flows related to common stock repurchased includes common stock repurchased in the prior period for which settlement occurred during the current period and excludes common stock repurchased during the current period for which settlement occurred in the following period.

*Non-cash activities during 2018:*

- The firm received $773 million of loans receivable and $109 million of held-to-maturity securities in connection with the securitization of financial instruments owned and held for sale loans included in customer and other receivables.
- The firm exchanged $35 million of Trust Preferred Securities and common beneficial interests for $35 million of certain of the firm's junior subordinated debt.

*Non-cash activities during 2017:*

- The firm received $465 million of loans receivable and $107 million of held-to-maturity securities in connection with the securitization of financial instruments owned and held for sale loans included in customer and other receivables.
- The firm exchanged $237 million of Trust Preferred Securities and common beneficial interests for $248 million of the firm's junior subordinated debt.

*Non-cash activities during 2016:*

- The firm received $389 million of loans receivable and $112 million of held-to-maturity securities in connection with the securitization of financial instruments owned.
- The impact of adoption of ASU No. 2015-02 was a net reduction to both total assets and total liabilities of approximately $200 million. See Note 3 for further information.
- The firm sold assets of $1.81 billion and liabilities of $697 million, that were previously classified as held for sale, in exchange for $1.11 billion of financial instruments.
- The firm exchanged $1.04 billion of APEX for $1.31 billion of Series E and Series F Preferred Stock. See Note 19 for further information.
- The firm exchanged $127 million of senior guaranteed trust securities for $124 million of the firm's junior subordinated debt.

The accompanying notes are an integral part of these consolidated financial statements.

**Note 1.**

## Description of Business

The Goldman Sachs Group, Inc. (Group Inc. or parent company), a Delaware corporation, together with its consolidated subsidiaries (collectively, the firm), is a leading global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals. Founded in 1869, the firm is headquartered in New York and maintains offices in all major financial centers around the world.

The firm reports its activities in the following four business segments:

### Investment Banking

The firm provides a broad range of investment banking services to a diverse group of corporations, financial institutions, investment funds and governments. Services include strategic advisory assignments with respect to mergers and acquisitions, divestitures, corporate defense activities, restructurings, spin-offs and risk management, and debt and equity underwriting of public offerings and private placements, including local and cross-border transactions and acquisition financing, as well as derivative transactions directly related to these activities.

### Institutional Client Services

The firm facilitates client transactions and makes markets in fixed income, equity, currency and commodity products, primarily with institutional clients such as corporations, financial institutions, investment funds and governments. The firm also makes markets in and clears client transactions on major stock, options and futures exchanges worldwide and provides financing, securities lending and other prime brokerage services to institutional clients.

### Investing & Lending

The firm invests in and originates loans to provide financing to clients. These investments and loans are typically longer-term in nature. The firm makes investments, some of which are consolidated, including through its Merchant Banking business and its Special Situations Group, in debt securities and loans, public and private equity securities, infrastructure and real estate entities. Some of these investments are made indirectly through funds that the firm manages. The firm also makes unsecured loans through its digital platform, *Marcus: by Goldman Sachs* and secured loans through its digital platform, *Goldman Sachs Private Bank Select*.

### Investment Management

The firm provides investment management services and offers investment products (primarily through separately managed accounts and commingled vehicles, such as mutual funds and private investment funds) across all major asset classes to a diverse set of institutional and individual clients. The firm also offers wealth advisory services provided by the firm's subsidiary, The Ayco Company, L.P., including portfolio management and financial planning and counseling, and brokerage and other transaction services to high-net-worth individuals and families.

**Note 2.**

## Basis of Presentation

These consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States (U.S. GAAP) and include the accounts of Group Inc. and all other entities in which the firm has a controlling financial interest. Intercompany transactions and balances have been eliminated.

All references to 2018, 2017 and 2016 refer to the firm's years ended, or the dates, as the context requires, December 31, 2018, December 31, 2017 and December 31, 2016, respectively. Any reference to a future year refers to a year ending on December 31 of that year. Certain reclassifications have been made to previously reported amounts to conform to the current presentation.

## Note 3.
## Significant Accounting Policies

The firm's significant accounting policies include when and how to measure the fair value of assets and liabilities, accounting for goodwill and identifiable intangible assets, and when to consolidate an entity. See Notes 5 through 8 for policies on fair value measurements, Note 13 for policies on goodwill and identifiable intangible assets, and below and Note 12 for policies on consolidation accounting. All other significant accounting policies are either described below or included in the following footnotes:

| | |
|---|---|
| Financial Instruments Owned and Financial Instruments Sold, But Not Yet Purchased | Note 4 |
| Fair Value Measurements | Note 5 |
| Cash Instruments | Note 6 |
| Derivatives and Hedging Activities | Note 7 |
| Fair Value Option | Note 8 |
| Loans Receivable | Note 9 |
| Collateralized Agreements and Financings | Note 10 |
| Securitization Activities | Note 11 |
| Variable Interest Entities | Note 12 |
| Other Assets | Note 13 |
| Deposits | Note 14 |
| Short-Term Borrowings | Note 15 |
| Long-Term Borrowings | Note 16 |
| Other Liabilities | Note 17 |
| Commitments, Contingencies and Guarantees | Note 18 |
| Shareholders' Equity | Note 19 |
| Regulation and Capital Adequacy | Note 20 |
| Earnings Per Common Share | Note 21 |
| Transactions with Affiliated Funds | Note 22 |
| Interest Income and Interest Expense | Note 23 |
| Income Taxes | Note 24 |
| Business Segments | Note 25 |
| Credit Concentrations | Note 26 |
| Legal Proceedings | Note 27 |
| Employee Benefit Plans | Note 28 |
| Employee Incentive Plans | Note 29 |
| Parent Company | Note 30 |

### Consolidation

The firm consolidates entities in which the firm has a controlling financial interest. The firm determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity (VIE).

**Voting Interest Entities.** Voting interest entities are entities in which (i) the total equity investment at risk is sufficient to enable the entity to finance its activities independently and (ii) the equity holders have the power to direct the activities of the entity that most significantly impact its economic performance, the obligation to absorb the losses of the entity and the right to receive the residual returns of the entity. The usual condition for a controlling financial interest in a voting interest entity is ownership of a majority voting interest. If the firm has a controlling majority voting interest in a voting interest entity, the entity is consolidated.

**Variable Interest Entities.** A VIE is an entity that lacks one or more of the characteristics of a voting interest entity. The firm has a controlling financial interest in a VIE when the firm has a variable interest or interests that provide it with (i) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and (ii) the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE. See Note 12 for further information about VIEs.

**Equity-Method Investments.** When the firm does not have a controlling financial interest in an entity but can exert significant influence over the entity's operating and financial policies, the investment is accounted for either (i) under the equity method of accounting or (ii) at fair value by electing the fair value option available under U.S. GAAP. Significant influence generally exists when the firm owns 20% to 50% of the entity's common stock or in-substance common stock.

In general, the firm accounts for investments acquired after the fair value option became available, at fair value. In certain cases, the firm applies the equity method of accounting to new investments that are strategic in nature or closely related to the firm's principal business activities, when the firm has a significant degree of involvement in the cash flows or operations of the investee or when cost-benefit considerations are less significant. See Note 13 for further information about equity-method investments.

**Investment Funds.** The firm has formed numerous investment funds with third-party investors. These funds are typically organized as limited partnerships or limited liability companies for which the firm acts as general partner or manager. Generally, the firm does not hold a majority of the economic interests in these funds. These funds are usually voting interest entities and generally are not consolidated because third-party investors typically have rights to terminate the funds or to remove the firm as general partner or manager. Investments in these funds are generally measured at net asset value (NAV) and are included in financial instruments owned. See Notes 6, 18 and 22 for further information about investments in funds.

## Use of Estimates

Preparation of these consolidated financial statements requires management to make certain estimates and assumptions, the most important of which relate to fair value measurements, accounting for goodwill and identifiable intangible assets, the allowance for credit losses on loans receivable and lending commitments held for investment, provisions for losses that may arise from litigation and regulatory proceedings (including governmental investigations), and provisions for losses that may arise from tax audits. These estimates and assumptions are based on the best available information but actual results could be materially different.

## Revenue Recognition

**Financial Assets and Financial Liabilities at Fair Value.** Financial instruments owned and financial instruments sold, but not yet purchased are recorded at fair value either under the fair value option or in accordance with other U.S. GAAP. In addition, the firm has elected to account for certain of its other financial assets and financial liabilities at fair value by electing the fair value option. The fair value of a financial instrument is the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Financial assets are marked to bid prices and financial liabilities are marked to offer prices. Fair value measurements do not include transaction costs. Fair value gains or losses are generally included in market making for positions in Institutional Client Services and other principal transactions for positions in Investing & Lending. See Notes 5 through 8 for further information about fair value measurements.

**Revenue from Contracts with Clients.** Beginning in January 2018, the firm accounts for revenue earned from contracts with clients for services such as investment banking, investment management, and execution and clearing (contracts with clients) under ASU No. 2014-09, "Revenue from Contracts with Customers (Topic 606)." As such, revenues for these services are recognized when the performance obligations related to the underlying transaction are completed. See "Recent Accounting Developments — Revenue from Contracts with Customers (ASC 606)" for further information.

The firm's net revenues from contracts with clients subject to this ASU represent approximately 50% of the firm's total net revenues for 2018. This includes approximately 80% of the firm's investment banking revenues, substantially all of the investment management revenues, and commissions and fees for 2018. See Note 25 for information about the firm's net revenues by business segment.

### *Investment Banking*

**Advisory.** Fees from financial advisory assignments are recognized in revenues when the services related to the underlying transaction are completed under the terms of the assignment. Beginning in January 2018, non-refundable deposits and milestone payments in connection with financial advisory assignments are recognized in revenues upon completion of the underlying transaction or when the assignment is otherwise concluded. Prior to January 2018, non-refundable deposits and milestone payments were recognized in revenues in accordance with the terms of the contract.

Beginning in January 2018, certain expenses associated with financial advisory assignments are recognized when incurred. Client reimbursements for such expenses are included in financial advisory revenues. Prior to January 2018, such expenses were deferred until the related revenue was recognized or the assignment was otherwise concluded and were presented net of client reimbursements.

**Underwriting.** Fees from underwriting assignments are recognized in revenues upon completion of the underlying transaction based on the terms of the assignment.

Certain expenses associated with underwriting assignments are deferred until the related revenue is recognized or the assignment is otherwise concluded. Beginning in January 2018, such expenses are presented as operating expenses. Prior to January 2018, such expenses were presented net within underwriting revenues.

***Investment Management***

The firm earns management fees and incentive fees for investment management services, which are included in investment management revenues. The firm makes payments to brokers and advisors related to the placement of the firm's investment funds (distribution fees), which are included in brokerage, clearing, exchange and distribution fees.

**Management Fees.** Management fees for mutual funds are calculated as a percentage of daily net asset value and are received monthly. Management fees for hedge funds and separately managed accounts are calculated as a percentage of month-end net asset value and are generally received quarterly. Management fees for private equity funds are calculated as a percentage of monthly invested capital or committed capital and are received quarterly, semi-annually or annually, depending on the fund. Management fees are recognized over time in the period the investment management services are provided.

Distribution fees paid by the firm are calculated based on either a percentage of the management fee, the investment fund's net asset value or the committed capital. Beginning in January 2018, the firm presents such fees in brokerage, clearing, exchange and distribution fees. Prior to January 2018, where the firm was considered an agent to the arrangement, such fees were presented on a net basis in investment management revenues.

**Incentive Fees.** Incentive fees are calculated as a percentage of a fund's or separately managed account's return, or excess return above a specified benchmark or other performance target. Incentive fees are generally based on investment performance over a twelve-month period or over the life of a fund. Fees that are based on performance over a twelve-month period are subject to adjustment prior to the end of the measurement period. For fees that are based on investment performance over the life of the fund, future investment underperformance may require fees previously distributed to the firm to be returned to the fund.

Beginning in January 2018, incentive fees earned from a fund or separately managed account are recognized when it is probable that a significant reversal of such fees will not occur, which is generally when such fees are no longer subject to fluctuations in the market value of investments held by the fund or separately managed account. Therefore, incentive fees recognized during the period may relate to performance obligations satisfied in previous periods. Prior to January 2018, incentive fees were recognized only when all material contingencies were resolved.

***Commissions and Fees***

The firm earns commissions and fees from executing and clearing client transactions on stock, options and futures markets, as well as over-the-counter (OTC) transactions. Commissions and fees are recognized on the day the trade is executed. The firm also provides third-party research services to clients in connection with certain soft-dollar arrangements.

Beginning in January 2018, third-party research costs incurred by the firm in connection with soft-dollar arrangements are presented net within commissions and fees. Prior to January 2018, such costs were presented in brokerage, clearing, exchange and distribution fees.

***Remaining Performance Obligations***

Remaining performance obligations are services that the firm has committed to perform in the future in connection with its contracts with clients. The firm's remaining performance obligations are generally related to its financial advisory assignments and certain investment management activities. Revenues associated with remaining performance obligations relating to financial advisory assignments cannot be determined until the outcome of the transaction. For the firm's investment management activities, where fees are calculated based on the net asset value of the fund or separately managed account, future revenues associated with remaining performance obligations cannot be determined as such fees are subject to fluctuations in the market value of investments held by the fund or separately managed account.

The firm is able to determine the future revenues associated with management fees calculated based on committed capital. As of December 2018, substantially all of the firm's future net revenues associated with remaining performance obligations will be recognized through 2024. Annual revenues associated with such performance obligations average less than $250 million through 2024.

**Transfers of Financial Assets**

Transfers of financial assets are accounted for as sales when the firm has relinquished control over the assets transferred. For transfers of financial assets accounted for as sales, any gains or losses are recognized in net revenues. Assets or liabilities that arise from the firm's continuing involvement with transferred financial assets are initially recognized at fair value. For transfers of financial assets that are not accounted for as sales, the assets are generally included in financial instruments owned and the transfer is accounted for as a collateralized financing, with the related interest expense recognized over the life of the transaction. See Note 10 for further information about transfers of financial assets accounted for as collateralized financings and Note 11 for further information about transfers of financial assets accounted for as sales.

### Cash and Cash Equivalents

The firm defines cash equivalents as highly liquid overnight deposits held in the ordinary course of business. Cash and cash equivalents included cash and due from banks of \$10.66 billion as of December 2018 and \$10.79 billion as of December 2017. Cash and cash equivalents also included interest-bearing deposits with banks of \$119.89 billion as of December 2018 and \$99.26 billion as of December 2017.

The firm segregates cash for regulatory and other purposes related to client activity. Cash and cash equivalents segregated for regulatory and other purposes were \$23.14 billion as of December 2018 and \$18.44 billion as of December 2017. In addition, the firm segregates securities for regulatory and other purposes related to client activity. See Note 10 for further information about segregated securities.

### Customer and Other Receivables

Customer and other receivables included receivables from customers and counterparties of \$53.81 billion as of December 2018 and \$60.11 billion as of December 2017, and receivables from brokers, dealers and clearing organizations of \$25.50 billion as of December 2018 and \$24.68 billion as of December 2017. Such receivables primarily consist of customer margin loans, receivables resulting from unsettled transactions, collateral posted in connection with certain derivative transactions and certain transfers of assets accounted for as secured loans rather than purchases at fair value.

Substantially all of these receivables are accounted for at amortized cost net of estimated uncollectible amounts. Certain of the firm's customer and other receivables are accounted for at fair value under the fair value option, with changes in fair value generally included in market making revenues. See Note 8 for further information about customer and other receivables accounted for at fair value under the fair value option. In addition, the firm's customer and other receivables included \$3.83 billion as of December 2018 and \$4.63 billion as of December 2017 of loans held for sale accounted for at the lower of cost or fair value. See Note 5 for an overview of the firm's fair value measurement policies. As of both December 2018 and December 2017, the carrying value of receivables not accounted for at fair value generally approximated fair value. As these receivables are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these receivables been included in the firm's fair value hierarchy, substantially all would have been classified in level 2 as of both December 2018 and December 2017. Interest on customer and other receivables is recognized over the life of the transaction and included in interest income.

Customer and other receivables includes receivables from contracts with clients and, beginning in January 2018, also includes contract assets. Contract assets represent the firm's right to receive consideration for services provided in connection with its contracts with clients for which collection is conditional and not merely subject to the passage of time. As of December 2018, the firm's receivables from contracts with clients were \$1.94 billion and contract assets were not material.

### Customer and Other Payables

Customer and other payables included payables to customers and counterparties of \$173.99 billion as of December 2018 and \$171.50 billion as of December 2017, and payables to brokers, dealers and clearing organizations of \$6.24 billion as of December 2018 and \$6.67 billion as of December 2017. Such payables primarily consist of customer credit balances related to the firm's prime brokerage activities. Customer and other payables are accounted for at cost plus accrued interest, which generally approximates fair value. As these payables are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these payables been included in the firm's fair value hierarchy, substantially all would have been classified in level 2 as of both December 2018 and December 2017. Interest on customer and other payables is recognized over the life of the transaction and included in interest expense.

### Offsetting Assets and Liabilities

To reduce credit exposures on derivatives and securities financing transactions, the firm may enter into master netting agreements or similar arrangements (collectively, netting agreements) with counterparties that permit it to offset receivables and payables with such counterparties. A netting agreement is a contract with a counterparty that permits net settlement of multiple transactions with that counterparty, including upon the exercise of termination rights by a non-defaulting party. Upon exercise of such termination rights, all transactions governed by the netting agreement are terminated and a net settlement amount is calculated. In addition, the firm receives and posts cash and securities collateral with respect to its derivatives and securities financing transactions, subject to the terms of the related credit support agreements or similar arrangements (collectively, credit support agreements). An enforceable credit support agreement grants the non-defaulting party exercising termination rights the right to liquidate the collateral and apply the proceeds to any amounts owed. In order to assess enforceability of the firm's right of setoff under netting and credit support agreements, the firm evaluates various factors, including applicable bankruptcy laws, local statutes and regulatory provisions in the jurisdiction of the parties to the agreement.

Derivatives are reported on a net-by-counterparty basis (i.e., the net payable or receivable for derivative assets and liabilities for a given counterparty) in the consolidated statements of financial condition when a legal right of setoff exists under an enforceable netting agreement. Securities purchased under agreements to resell (resale agreements) and securities sold under agreements to repurchase (repurchase agreements) and securities borrowed and loaned transactions with the same term and currency are presented on a net-by-counterparty basis in the consolidated statements of financial condition when such transactions meet certain settlement criteria and are subject to netting agreements.

In the consolidated statements of financial condition, derivatives are reported net of cash collateral received and posted under enforceable credit support agreements, when transacted under an enforceable netting agreement. In the consolidated statements of financial condition, resale and repurchase agreements, and securities borrowed and loaned, are not reported net of the related cash and securities received or posted as collateral. See Note 10 for further information about collateral received and pledged, including rights to deliver or repledge collateral. See Notes 7 and 10 for further information about offsetting.

**Foreign Currency Translation**

Assets and liabilities denominated in non-U.S. currencies are translated at rates of exchange prevailing on the date of the consolidated statements of financial condition and revenues and expenses are translated at average rates of exchange for the period. Foreign currency remeasurement gains or losses on transactions in nonfunctional currencies are recognized in earnings. Gains or losses on translation of the financial statements of a non-U.S. operation, when the functional currency is other than the U.S. dollar, are included, net of hedges and taxes, in the consolidated statements of comprehensive income.

**Recent Accounting Developments**

**Revenue from Contracts with Customers (ASC 606).** In May 2014, the FASB issued ASU No. 2014-09. This ASU, as amended, provides comprehensive guidance on the recognition of revenue earned from contracts with customers arising from the transfer of goods and services, guidance on accounting for certain contract costs and new disclosures.

The firm adopted this ASU in January 2018 under a modified retrospective approach. As a result of adopting this ASU, the firm, among other things, delays recognition of non-refundable and milestone payments on financial advisory assignments until the assignments are completed, and recognizes certain investment management fees earlier than under the firm's previous revenue recognition policies.

The firm also prospectively changed the presentation of certain costs from a net presentation within revenues to a gross basis, and vice versa. Beginning in 2018, certain underwriting expenses, which were netted against investment banking revenues, and certain distribution fees, which were netted against investment management revenues, are presented gross as operating expenses. Costs incurred in connection with certain soft-dollar arrangements, which were presented gross as operating expenses, are presented net within commissions and fees.

The cumulative effect of adopting this ASU as of January 1, 2018 was a decrease to retained earnings of $53 million (net of tax). In addition, net revenues and operating expenses were both higher by approximately $300 million for 2018, due to the changes in the presentation of certain costs from a net presentation within revenues to a gross basis.

**Recognition and Measurement of Financial Assets and Financial Liabilities (ASC 825).** In January 2016, the FASB issued ASU No. 2016-01, "Financial Instruments (Topic 825) — Recognition and Measurement of Financial Assets and Financial Liabilities." This ASU amends certain aspects of recognition, measurement, presentation and disclosure of financial instruments. It includes a requirement to present separately in other comprehensive income changes in fair value attributable to a firm's own credit spreads (debt valuation adjustment or DVA), net of tax, on financial liabilities for which the fair value option was elected.

In January 2016, the firm early adopted this ASU for the requirements related to DVA and reclassified the cumulative DVA, a gain of $305 million (net of tax), from retained earnings to accumulated other comprehensive loss. The adoption of the remaining provisions of the ASU in January 2018 did not have a material impact on the firm's financial condition, results of operations or cash flows.

**Leases (ASC 842).** In February 2016, the FASB issued ASU No. 2016-02, "Leases (Topic 842)." This ASU requires that, for leases longer than one year, a lessee recognize in the statements of financial condition a right-of-use asset, representing the right to use the underlying asset for the lease term, and a lease liability, representing the liability to make lease payments. It also requires that for finance leases, a lessee recognize interest expense on the lease liability, separately from the amortization of the right-of-use asset in the statements of earnings, while for operating leases, such amounts should be recognized as a combined expense. It also requires that for qualifying sale-leaseback transactions the seller recognize any gain or loss (based on the estimated fair value of the asset at the time of sale) when control of the asset is transferred instead of amortizing it over the lease period. In addition, this ASU requires expanded disclosures about the nature and terms of lease agreements.

The firm adopted this ASU in January 2019 under a modified retrospective approach. The impact of adopting this ASU was a gross up of $1.77 billion on the firm's consolidated statements of financial condition and an increase to retained earnings of $12 million (net of tax) as of January 1, 2019.

**Improvements to Employee Share-Based Payment Accounting (ASC 718).** In March 2016, the FASB issued ASU No. 2016-09, "Compensation — Stock Compensation (Topic 718) — Improvements to Employee Share-Based Payment Accounting." This ASU includes a requirement that the tax effect related to the settlement of share-based awards be recorded in income tax benefit or expense in the statements of earnings rather than directly to additional paid-in capital. This change has no impact on total shareholders' equity and is required to be adopted prospectively. The ASU also allows for forfeitures to be recorded when they occur rather than estimated over the vesting period. This change is required to be applied on a modified retrospective basis.

The firm adopted the ASU in January 2017 and subsequent to the adoption, the tax effect related to the settlement of share-based awards is recognized in the statements of earnings rather than directly to additional paid-in capital. The firm also elected to account for forfeitures as they occur, rather than to estimate forfeitures over the vesting period, and the cumulative effect of this election upon adoption was an increase of $35 million to share-based awards and a decrease of $24 million (net of tax of $11 million) to retained earnings.

In addition, the ASU modifies the classification of certain share-based payment activities within the statements of cash flows. Upon adoption, the firm reclassified amounts related to such activities within the consolidated statements of cash flows, on a retrospective basis.

**Measurement of Credit Losses on Financial Instruments (ASC 326).** In June 2016, the FASB issued ASU No. 2016-13, "Financial Instruments — Credit Losses (Topic 326) — Measurement of Credit Losses on Financial Instruments." This ASU amends several aspects of the measurement of credit losses on financial instruments, including replacing the existing incurred credit loss model and other models with the Current Expected Credit Losses (CECL) model and amending certain aspects of accounting for purchased financial assets with deterioration in credit quality since origination.

Under CECL, the allowance for losses for financial assets that are measured at amortized cost reflects management's estimate of credit losses over the remaining expected life of the financial assets. Expected credit losses for newly recognized financial assets, as well as changes to expected credit losses during the period, would be recognized in earnings. For certain purchased financial assets with deterioration in credit quality since origination, an initial allowance would be recorded for expected credit losses and recognized as an increase to the purchase price rather than as an expense. The ASU eliminates the existing accounting guidance for Purchased Credit Impaired (PCI) loans. The ASU is effective for the firm in January 2020 under a modified retrospective approach with early adoption permitted beginning in January 2019. The firm plans to adopt this ASU on January 1, 2020.

Expected credit losses, including losses on off-balance-sheet exposures such as lending commitments, will be measured based on historical experience, current conditions and forecasts that affect the collectability of the reported amount.

The firm has substantially completed development of credit loss models for its significant loan portfolios and is in the process of validating data inputs to these models, while continuing to develop the policies, systems and controls that will be required to implement CECL. The firm currently expects to begin testing of these models in the first half of 2019. The firm currently expects that its allowance for credit losses will likely increase when CECL is adopted as the allowance will cover expected credit losses over the full expected life of the loan portfolios and will also take into account expected changes in future economic conditions. In addition, an allowance will be recorded for certain purchased loans with deterioration in credit quality since origination with a corresponding increase to their gross carrying value. The extent of the impact of adoption of this ASU on the firm's financial condition, results of operations and cash flows will depend on, among other things, the economic environment, and the size and type of loan portfolios held by the firm on the date of adoption.

**Classification of Certain Cash Receipts and Cash Payments (ASC 230).** In August 2016, the FASB issued ASU No. 2016-15, "Statement of Cash Flows (Topic 230) — Classification of Certain Cash Receipts and Cash Payments." This ASU provides guidance on the disclosure and classification of certain items within the statements of cash flows.

The firm adopted this ASU in January 2018 under a retrospective approach. The impact for 2017 was an increase of $485 million to net cash used for operating activities, a decrease of $477 million to net cash used for investing activities and an increase of $8 million to net cash provided by financing activities. The impact for 2016 was a decrease of $406 million to net cash provided by operating activities, an increase of $405 million to net cash provided by investing activities and an increase of $1 million to net cash provided by financing activities.

**Clarifying the Definition of a Business (ASC 805).** In January 2017, the FASB issued ASU No. 2017-01, "Business Combinations (Topic 805) — Clarifying the Definition of a Business." The ASU amends the definition of a business and provides a threshold which must be considered to determine whether a transaction is an acquisition (or disposal) of an asset or a business.

The firm adopted this ASU in January 2018 under a prospective approach. Adoption of the ASU did not have a material impact on the firm's financial condition, results of operations or cash flows. The firm expects that fewer transactions will be treated as acquisitions (or disposals) of businesses as a result of adopting this ASU.

**Simplifying the Test for Goodwill Impairment (ASC 350).** In January 2017, the FASB issued ASU No. 2017-04, "Intangibles — Goodwill and Other (Topic 350) — Simplifying the Test for Goodwill Impairment." The ASU simplifies the quantitative goodwill impairment test by eliminating the second step of the test. Under this ASU, impairment will be measured by comparing the estimated fair value of the reporting unit with its carrying value.

The firm early adopted this ASU in the fourth quarter of 2017. Adoption of the ASU did not have a material impact on the results of the firm's goodwill impairment test.

**Clarifying the Scope of Asset Derecognition Guidance and Accounting for Partial Sales of Nonfinancial Assets (ASC 610-20).** In February 2017, the FASB issued ASU No. 2017-05, "Other Income — Gains and Losses from the Derecognition of Nonfinancial Assets (Subtopic 610-20) — Clarifying the Scope of Asset Derecognition Guidance and Accounting for Partial Sales of Nonfinancial Assets." The ASU clarifies the scope of guidance applicable to sales of nonfinancial assets and also provides guidance on accounting for partial sales of such assets.

The firm adopted this ASU in January 2018 under a modified retrospective approach. Adoption of the ASU did not have an impact on the firm's financial condition, results of operations or cash flows.

**Targeted Improvements to Accounting for Hedging Activities (ASC 815).** In August 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815) — Targeted Improvements to Accounting for Hedging Activities." The ASU amends certain rules for hedging relationships, expands the types of strategies that are eligible for hedge accounting treatment to more closely align the results of hedge accounting with risk management activities and amends disclosure requirements related to fair value and net investment hedges.

The firm early adopted this ASU in January 2018 under a modified retrospective approach for hedge accounting treatment, and under a prospective approach for the amended disclosure requirements. Adoption of this ASU did not have a material impact on the firm's financial condition, results of operations or cash flows. See Note 7 for further information.

**Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income (ASC 220).** In February 2018, the FASB issued ASU No. 2018-02, "Income Statement — Reporting Comprehensive Income (Topic 220) — Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income." This ASU permits a reporting entity to reclassify the income tax effects of the Tax Cuts and Jobs Act (Tax Legislation) on items within accumulated other comprehensive income to retained earnings.

The firm adopted this ASU in January 2019 and did not elect to reclassify the income tax effects of Tax Legislation from accumulated other comprehensive income to retained earnings. Therefore, the adoption of the ASU did not have an impact on the firm's financial condition, results of operations or cash flows.

**Changes to the Disclosure Requirements for Fair Value Measurement (ASC 820).** In August 2018, the FASB issued ASU No. 2018-13, "Fair Value Measurement (Topic 820) — Changes to the Disclosure Requirements for Fair Value Measurement." This ASU, among other amendments, eliminates the requirement to disclose the amounts and reasons for transfers between level 1 and level 2 of the fair value hierarchy and modifies the disclosure requirement relating to investments in funds at NAV. The firm early adopted this ASU in the third quarter of 2018 and disclosures were modified in accordance with the ASU. See Notes 5 through 8 for further information.

**Note 4.**

## Financial Instruments Owned and Financial Instruments Sold, But Not Yet Purchased

Financial instruments owned and financial instruments sold, but not yet purchased are accounted for at fair value either under the fair value option or in accordance with other U.S. GAAP. See Note 8 for information about other financial assets and financial liabilities at fair value.

The table below presents financial instruments owned and financial instruments sold, but not yet purchased.

| *$ in millions* | Financial Instruments Owned | Financial Instruments Sold, But Not Yet Purchased |
|---|---|---|
| **As of December 2018** | | |
| Money market instruments | **$ 2,635** | **$ –** |
| Government and agency obligations: | | |
| U.S. | **110,616** | **5,080** |
| Non-U.S. | **43,607** | **25,347** |
| Loans and securities backed by: | | |
| Commercial real estate | **3,369** | **–** |
| Residential real estate | **12,949** | **1** |
| Corporate debt instruments | **31,207** | **10,411** |
| State and municipal obligations | **1,233** | **–** |
| Other debt obligations | **1,864** | **1** |
| Equity securities | **76,170** | **25,463** |
| Commodities | **3,729** | **–** |
| Investments in funds at NAV | **3,936** | **–** |
| Subtotal | **291,315** | **66,303** |
| Derivatives | **44,846** | **42,594** |
| **Total** | **$336,161** | **$108,897** |
| As of December 2017 | | |
| Money market instruments | $ 1,608 | $ – |
| Government and agency obligations: | | |
| U.S. | 76,418 | 17,911 |
| Non-U.S. | 33,956 | 23,311 |
| Loans and securities backed by: | | |
| Commercial real estate | 3,436 | 1 |
| Residential real estate | 11,993 | – |
| Corporate debt instruments | 33,683 | 7,153 |
| State and municipal obligations | 1,471 | – |
| Other debt obligations | 2,164 | 1 |
| Equity securities | 96,132 | 23,882 |
| Commodities | 3,194 | 40 |
| Investments in funds at NAV | 4,596 | – |
| Subtotal | 268,651 | 72,299 |
| Derivatives | 47,337 | 39,631 |
| Total | $315,988 | $111,930 |

In the table above:

- Money market instruments includes commercial paper, certificates of deposit and time deposits, substantially all of which have a maturity of less than one year.
- Corporate debt instruments includes corporate loans and debt securities.
- Equity securities includes public and private equities, exchange-traded funds and convertible debentures. Such amounts include investments accounted for at fair value under the fair value option where the firm would otherwise apply the equity method of accounting of $7.91 billion as of December 2018 and $8.49 billion as of December 2017.

### Gains and Losses from Market Making and Other Principal Transactions

The table below presents market making revenues by major product type and other principal transactions revenues.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Interest rates | **$ (2,056)** | $ 6,406 | $ (1,979) |
| Credit | **1,276** | 701 | 1,854 |
| Currencies | **4,582** | (3,249) | 6,158 |
| Equities | **5,186** | 3,162 | 2,873 |
| Commodities | **463** | 640 | 1,027 |
| **Market making** | **9,451** | 7,660 | 9,933 |
| **Other principal transactions** | **5,823** | 5,913 | 3,382 |
| **Total** | **$15,274** | $13,573 | $13,315 |

In the table above:

- Gains/(losses) include both realized and unrealized gains and losses, and are primarily related to the firm's financial instruments owned and financial instruments sold, but not yet purchased, including both derivative and non-derivative financial instruments.
- Gains/(losses) exclude related interest income and interest expense. See Note 23 for further information about interest income and interest expense.
- Gains/(losses) on other principal transactions are included in the firm's Investing & Lending segment. See Note 25 for net revenues, including net interest income, by product type for Investing & Lending, as well as the amount of net interest income included in Investing & Lending.
- Gains/(losses) are not representative of the manner in which the firm manages its business activities because many of the firm's market-making and client facilitation strategies utilize financial instruments across various product types. Accordingly, gains or losses in one product type frequently offset gains or losses in other product types. For example, most of the firm's longer-term derivatives across product types are sensitive to changes in interest rates and may be economically hedged with interest rate swaps. Similarly, a significant portion of the firm's cash instruments and derivatives across product types has exposure to foreign currencies and may be economically hedged with foreign currency contracts.

**Note 5.**

## Fair Value Measurements

The fair value of a financial instrument is the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Financial assets are marked to bid prices and financial liabilities are marked to offer prices. Fair value measurements do not include transaction costs. The firm measures certain financial assets and financial liabilities as a portfolio (i.e., based on its net exposure to market and/or credit risks).

The best evidence of fair value is a quoted price in an active market. If quoted prices in active markets are not available, fair value is determined by reference to prices for similar instruments, quoted prices or recent transactions in less active markets, or internally developed models that primarily use market-based or independently sourced inputs, including, but not limited to, interest rates, volatilities, equity or debt prices, foreign exchange rates, commodity prices, credit spreads and funding spreads (i.e., the spread or difference between the interest rate at which a borrower could finance a given financial instrument relative to a benchmark interest rate).

U.S. GAAP has a three-level hierarchy for disclosure of fair value measurements. This hierarchy prioritizes inputs to the valuation techniques used to measure fair value, giving the highest priority to level 1 inputs and the lowest priority to level 3 inputs. A financial instrument's level in this hierarchy is based on the lowest level of input that is significant to its fair value measurement. In evaluating the significance of a valuation input, the firm considers, among other factors, a portfolio's net risk exposure to that input. The fair value hierarchy is as follows:

**Level 1.** Inputs are unadjusted quoted prices in active markets to which the firm had access at the measurement date for identical, unrestricted assets or liabilities.

**Level 2.** Inputs to valuation techniques are observable, either directly or indirectly.

**Level 3.** One or more inputs to valuation techniques are significant and unobservable.

The fair values for substantially all of the firm's financial assets and financial liabilities are based on observable prices and inputs and are classified in levels 1 and 2 of the fair value hierarchy. Certain level 2 and level 3 financial assets and financial liabilities may require appropriate valuation adjustments that a market participant would require to arrive at fair value for factors such as counterparty and the firm's credit quality, funding risk, transfer restrictions, liquidity and bid/offer spreads. Valuation adjustments are generally based on market evidence.

See Notes 6 through 8 for further information about fair value measurements of cash instruments, derivatives and other financial assets and financial liabilities at fair value.

The table below presents financial assets and financial liabilities accounted for at fair value under the fair value option or in accordance with other U.S. GAAP.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Total level 1 financial assets | **$170,463** | $155,086 |
| Total level 2 financial assets | **354,515** | 395,606 |
| Total level 3 financial assets | **22,181** | 19,201 |
| Investments in funds at NAV | **3,936** | 4,596 |
| Counterparty and cash collateral netting | **(49,383)** | (56,366) |
| **Total financial assets at fair value** | **$501,712** | $518,123 |
| Total assets | **$931,796** | $916,776 |
| **Total level 3 financial assets divided by:** | | |
| Total assets | **2.4%** | 2.1% |
| Total financial assets at fair value | **4.4%** | 3.7% |
| Total level 1 financial liabilities | **$ 54,151** | $ 63,589 |
| Total level 2 financial liabilities | **258,335** | 261,719 |
| Total level 3 financial liabilities | **23,804** | 19,620 |
| Counterparty and cash collateral netting | **(39,786)** | (39,866) |
| **Total financial liabilities at fair value** | **$296,504** | $305,062 |
| **Total level 3 financial liabilities divided by total financial liabilities at fair value** | **8.0%** | 6.4% |

In the table above:

- Counterparty netting among positions classified in the same level is included in that level.
- Counterparty and cash collateral netting represents the impact on derivatives of netting across levels of the fair value hierarchy.

The table below presents a summary of level 3 financial assets.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Cash instruments | **$17,227** | $15,395 |
| Derivatives | **4,948** | 3,802 |
| Other financial assets | **6** | 4 |
| **Total** | **$22,181** | $19,201 |

Level 3 financial assets as of December 2018 increased compared with December 2017, primarily reflecting an increase in level 3 cash instruments. See Notes 6 through 8 for further information about level 3 financial assets (including information about unrealized gains and losses related to level 3 financial assets and financial liabilities, and transfers in and out of level 3).

**Note 6.**

## Cash Instruments

Cash instruments include U.S. government and agency obligations, non-U.S. government and agency obligations, mortgage-backed loans and securities, corporate debt instruments, equity securities, investments in funds at NAV, and other non-derivative financial instruments owned and financial instruments sold, but not yet purchased. See below for the types of cash instruments included in each level of the fair value hierarchy and the valuation techniques and significant inputs used to determine their fair values. See Note 5 for an overview of the firm's fair value measurement policies.

### Level 1 Cash Instruments

Level 1 cash instruments include certain money market instruments, U.S. government obligations, most non-U.S. government obligations, certain government agency obligations, certain corporate debt instruments and actively traded listed equities. These instruments are valued using quoted prices for identical unrestricted instruments in active markets.

The firm defines active markets for equity instruments based on the average daily trading volume both in absolute terms and relative to the market capitalization for the instrument. The firm defines active markets for debt instruments based on both the average daily trading volume and the number of days with trading activity.

### Level 2 Cash Instruments

Level 2 cash instruments include most money market instruments, most government agency obligations, certain non-U.S. government obligations, most mortgage-backed loans and securities, most corporate debt instruments, most state and municipal obligations, most other debt obligations, restricted or less liquid listed equities, commodities and certain lending commitments.

Valuations of level 2 cash instruments can be verified to quoted prices, recent trading activity for identical or similar instruments, broker or dealer quotations or alternative pricing sources with reasonable levels of price transparency. Consideration is given to the nature of the quotations (e.g., indicative or firm) and the relationship of recent market activity to the prices provided from alternative pricing sources.

Valuation adjustments are typically made to level 2 cash instruments (i) if the cash instrument is subject to transfer restrictions and/or (ii) for other premiums and liquidity discounts that a market participant would require to arrive at fair value. Valuation adjustments are generally based on market evidence.

### Level 3 Cash Instruments

Level 3 cash instruments have one or more significant valuation inputs that are not observable. Absent evidence to the contrary, level 3 cash instruments are initially valued at transaction price, which is considered to be the best initial estimate of fair value. Subsequently, the firm uses other methodologies to determine fair value, which vary based on the type of instrument. Valuation inputs and assumptions are changed when corroborated by substantive observable evidence, including values realized on sales.

### Valuation Techniques and Significant Inputs of Level 3 Cash Instruments

Valuation techniques of level 3 cash instruments vary by instrument, but are generally based on discounted cash flow techniques. The valuation techniques and the nature of significant inputs used to determine the fair values of each type of level 3 cash instrument are described below:

**Loans and Securities Backed by Commercial Real Estate.** Loans and securities backed by commercial real estate are directly or indirectly collateralized by a single commercial real estate property or a portfolio of properties, and may include tranches of varying levels of subordination. Significant inputs are generally determined based on relative value analyses and include:

- Market yields implied by transactions of similar or related assets and/or current levels and changes in market indices such as the CMBX (an index that tracks the performance of commercial mortgage bonds);

- Transaction prices in both the underlying collateral and instruments with the same or similar underlying collateral;
- A measure of expected future cash flows in a default scenario (recovery rates) implied by the value of the underlying collateral, which is mainly driven by current performance of the underlying collateral, capitalization rates and multiples. Recovery rates are expressed as a percentage of notional or face value of the instrument and reflect the benefit of credit enhancements on certain instruments; and
- Timing of expected future cash flows (duration) which, in certain cases, may incorporate the impact of other unobservable inputs (e.g., prepayment speeds).

**Loans and Securities Backed by Residential Real Estate.** Loans and securities backed by residential real estate are directly or indirectly collateralized by portfolios of residential real estate and may include tranches of varying levels of subordination. Significant inputs are generally determined based on relative value analyses, which incorporate comparisons to instruments with similar collateral and risk profiles. Significant inputs include:

- Market yields implied by transactions of similar or related assets;
- Transaction prices in both the underlying collateral and instruments with the same or similar underlying collateral;
- Cumulative loss expectations, driven by default rates, home price projections, residential property liquidation timelines, related costs and subsequent recoveries; and
- Duration, driven by underlying loan prepayment speeds and residential property liquidation timelines.

**Corporate Debt Instruments.** Corporate debt instruments includes corporate loans and debt securities. Significant inputs for corporate debt instruments are generally determined based on relative value analyses, which incorporate comparisons both to prices of credit default swaps that reference the same or similar underlying instrument or entity and to other debt instruments for the same issuer for which observable prices or broker quotations are available. Significant inputs include:

- Market yields implied by transactions of similar or related assets and/or current levels and trends of market indices, such as the CDX (an index that tracks the performance of corporate credit);
- Current performance and recovery assumptions and, where the firm uses credit default swaps to value the related cash instrument, the cost of borrowing the underlying reference obligation; and
- Duration.

**Equity Securities.** Equity securities includes private equity securities and convertible debentures. Recent third-party completed or pending transactions (e.g., merger proposals, tender offers, debt restructurings) are considered to be the best evidence for any change in fair value. When these are not available, the following valuation methodologies are used, as appropriate:

- Industry multiples (primarily EBITDA multiples) and public comparables;
- Transactions in similar instruments;
- Discounted cash flow techniques; and
- Third-party appraisals.

The firm also considers changes in the outlook for the relevant industry and financial performance of the issuer as compared to projected performance. Significant inputs include:

- Market and transaction multiples;
- Discount rates and capitalization rates; and
- For equity securities with debt-like features, market yields implied by transactions of similar or related assets, current performance and recovery assumptions, and duration.

**Other Cash Instruments.** Other cash instruments includes U.S. government and agency obligations, non-U.S. government and agency obligations, state and municipal obligations, and other debt obligations. Significant inputs are generally determined based on relative value analyses, which incorporate comparisons both to prices of credit default swaps that reference the same or similar underlying instrument or entity and to other debt instruments for the same issuer for which observable prices or broker quotations are available. Significant inputs include:

- Market yields implied by transactions of similar or related assets and/or current levels and trends of market indices;
- Current performance and recovery assumptions and, where the firm uses credit default swaps to value the related cash instrument, the cost of borrowing the underlying reference obligation; and
- Duration.

### Fair Value of Cash Instruments by Level

The table below presents cash instrument assets and liabilities at fair value by level within the fair value hierarchy.

| $ in millions | Level 1 | Level 2 | Level 3 | Total |
|---|---|---|---|---|
| **As of December 2018** | | | | |
| **Assets** | | | | |
| Money market instruments | **$ 1,489** | **$ 1,146** | **$ –** | **$ 2,635** |
| Government and agency obligations: | | | | |
| U.S. | **82,264** | **28,327** | **25** | **110,616** |
| Non-U.S. | **33,231** | **10,366** | **10** | **43,607** |
| Loans and securities backed by: | | | | |
| Commercial real estate | **–** | **2,350** | **1,019** | **3,369** |
| Residential real estate | **–** | **12,286** | **663** | **12,949** |
| Corporate debt instruments | **468** | **26,515** | **4,224** | **31,207** |
| State and municipal obligations | **–** | **1,210** | **23** | **1,233** |
| Other debt obligations | **–** | **1,326** | **538** | **1,864** |
| Equity securities | **52,989** | **12,456** | **10,725** | **76,170** |
| Commodities | **–** | **3,729** | **–** | **3,729** |
| Subtotal | **$170,441** | **$ 99,711** | **$17,227** | **$287,379** |
| Investments in funds at NAV | | | | **3,936** |
| **Total cash instrument assets** | | | | **$291,315** |
| **Liabilities** | | | | |
| Government and agency obligations: | | | | |
| U.S. | **$ (5,067)** | **$ (13)** | **$ –** | **$ (5,080)** |
| Non-U.S. | **(23,872)** | **(1,475)** | **–** | **(25,347)** |
| Loans and securities backed by residential real estate | **–** | **(1)** | **–** | **(1)** |
| Corporate debt instruments | **(4)** | **(10,376)** | **(31)** | **(10,411)** |
| Other debt obligations | **–** | **(1)** | **–** | **(1)** |
| Equity securities | **(25,147)** | **(298)** | **(18)** | **(25,463)** |
| **Total cash instrument liabilities** | **$ (54,090)** | **$(12,164)** | **$ (49)** | **$ (66,303)** |
| As of December 2017 | | | | |
| **Assets** | | | | |
| Money market instruments | $ 398 | $ 1,209 | $ 1 | $ 1,608 |
| Government and agency obligations: | | | | |
| U.S. | 50,796 | 25,622 | – | 76,418 |
| Non-U.S. | 27,070 | 6,882 | 4 | 33,956 |
| Loans and securities backed by: | | | | |
| Commercial real estate | – | 2,310 | 1,126 | 3,436 |
| Residential real estate | – | 11,325 | 668 | 11,993 |
| Corporate debt instruments | 752 | 29,661 | 3,270 | 33,683 |
| State and municipal obligations | – | 1,401 | 70 | 1,471 |
| Other debt obligations | – | 1,812 | 352 | 2,164 |
| Equity securities | 76,044 | 10,184 | 9,904 | 96,132 |
| Commodities | – | 3,194 | – | 3,194 |
| Subtotal | $155,060 | $ 93,600 | $15,395 | $264,055 |
| Investments in funds at NAV | | | | 4,596 |
| Total cash instrument assets | | | | $268,651 |
| **Liabilities** | | | | |
| Government and agency obligations: | | | | |
| U.S. | $ (17,845) | $ (66) | $ – | $ (17,911) |
| Non-U.S. | (21,820) | (1,491) | – | (23,311) |
| Loans and securities backed by commercial real estate | – | (1) | – | (1) |
| Corporate debt instruments | (2) | (7,099) | (52) | (7,153) |
| Other debt obligations | – | (1) | – | (1) |
| Equity securities | (23,866) | – | (16) | (23,882) |
| Commodities | – | (40) | – | (40) |
| Total cash instrument liabilities | $ (63,533) | $ (8,698) | $ (68) | $ (72,299) |

In the table above:

- Cash instrument assets are included in financial instruments owned and cash instrument liabilities are included in financial instruments sold, but not yet purchased.
- Cash instrument assets are shown as positive amounts and cash instrument liabilities are shown as negative amounts.
- Money market instruments includes commercial paper, certificates of deposit and time deposits, substantially all of which have a maturity of less than one year.
- Corporate debt instruments includes corporate loans and debt securities.
- Equity securities includes public and private equities, exchange-traded funds and convertible debentures.
- As of both December 2018 and December 2017, substantially all level 3 equity securities consisted of private equity securities.

### Significant Unobservable Inputs

The table below presents the amount of level 3 assets, and ranges and weighted averages of significant unobservable inputs used to value level 3 cash instruments.

| | Level 3 Assets and Range of Significant Unobservable Inputs (Weighted Average) as of December | |
|---|---|---|
| $ in millions | **2018** | 2017 |
| **Loans and securities backed by commercial real estate** | | |
| Level 3 assets | **$1,019** | $1,126 |
| Yield | **6.9% to 22.5% (12.4%)** | 4.6% to 22.0% (13.4%) |
| Recovery rate | **9.7% to 78.4% (42.9%)** | 14.3% to 89.0% (43.8%) |
| Duration (years) | **0.4 to 7.1 (3.7)** | 0.8 to 6.4 (2.1) |
| **Loans and securities backed by residential real estate** | | |
| Level 3 assets | **$663** | $668 |
| Yield | **2.6% to 19.3% (9.2%)** | 2.3% to 15.0% (8.3%) |
| Cumulative loss rate | **8.3% to 37.7% (19.2%)** | 12.5% to 43.0% (21.8%) |
| Duration (years) | **1.4 to 14.0 (6.7)** | 0.7 to 14.0 (6.9) |
| **Corporate debt instruments** | | |
| Level 3 assets | **$4,224** | $3,270 |
| Yield | **0.7% to 32.3% (11.9%)** | 3.6% to 24.5% (12.3%) |
| Recovery rate | **0.0% to 78.0% (57.8%)** | 0.0% to 85.3% (62.8%) |
| Duration (years) | **0.4 to 13.5 (3.4)** | 0.5 to 7.6 (3.2) |
| **Equity securities** | | |
| Level 3 assets | **$10,725** | $9,904 |
| Multiples | **1.0x to 23.6x (8.1x)** | 1.1x to 30.5x (8.9x) |
| Discount rate/yield | **6.5% to 22.1% (14.3%)** | 3.0% to 20.3% (14.0%) |
| Capitalization rate | **3.5% to 12.3% (6.1%)** | 4.3% to 12.0% (6.1%) |
| **Other cash instruments** | | |
| Level 3 assets | **$596** | $427 |
| Yield | **4.1% to 11.5% (9.2%)** | 4.0% to 11.7% (8.4%) |
| Duration (years) | **2.2 to 4.8 (2.8)** | 3.5 to 11.4 (5.1) |

In the table above:

- Ranges represent the significant unobservable inputs that were used in the valuation of each type of cash instrument.
- Weighted averages are calculated by weighting each input by the relative fair value of the cash instruments.
- The ranges and weighted averages of these inputs are not representative of the appropriate inputs to use when calculating the fair value of any one cash instrument. For example, the highest multiple for private equity securities is appropriate for valuing a specific private equity security but may not be appropriate for valuing any other private equity security. Accordingly, the ranges of inputs do not represent uncertainty in, or possible ranges of, fair value measurements of level 3 cash instruments.
- Increases in yield, discount rate, capitalization rate, duration or cumulative loss rate used in the valuation of level 3 cash instruments would have resulted in a lower fair value measurement, while increases in recovery rate or multiples would have resulted in a higher fair value measurement as of both December 2018 and December 2017. Due to the distinctive nature of each level 3 cash instrument, the interrelationship of inputs is not necessarily uniform within each product type.
- Loans and securities backed by commercial and residential real estate, corporate debt instruments and other cash instruments are valued using discounted cash flows, and equity securities are valued using market comparables and discounted cash flows.
- The fair value of any one instrument may be determined using multiple valuation techniques. For example, market comparables and discounted cash flows may be used together to determine fair value. Therefore, the level 3 balance encompasses both of these techniques.

### Level 3 Rollforward

The table below presents a summary of the changes in fair value for level 3 cash instrument assets and liabilities.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Total cash instrument assets** | | |
| Beginning balance | **$15,395** | $18,035 |
| Net realized gains/(losses) | **501** | 419 |
| Net unrealized gains/(losses) | **816** | 1,144 |
| Purchases | **2,286** | 1,635 |
| Sales | **(2,184)** | (3,315) |
| Settlements | **(2,595)** | (2,265) |
| Transfers into level 3 | **5,149** | 2,405 |
| Transfers out of level 3 | **(2,141)** | (2,663) |
| **Ending balance** | **$17,227** | $15,395 |
| **Total cash instrument liabilities** | | |
| Beginning balance | **$ (68)** | $ (62) |
| Net realized gains/(losses) | **6** | (8) |
| Net unrealized gains/(losses) | **(7)** | (28) |
| Purchases | **41** | 97 |
| Sales | **(26)** | (20) |
| Settlements | **8** | (32) |
| Transfers into level 3 | **(7)** | (18) |
| Transfers out of level 3 | **4** | 3 |
| **Ending balance** | **$ (49)** | $ (68) |

In the table above:

- Changes in fair value are presented for all cash instrument assets and liabilities that are classified in level 3 as of the end of the period.
- Net unrealized gains/(losses) relates to instruments that were still held at period-end.
- Purchases includes originations and secondary purchases.
- Transfers between levels of the fair value hierarchy are reported at the beginning of the reporting period in which they occur. If a cash instrument asset or liability was transferred to level 3 during a reporting period, its entire gain or loss for the period is classified in level 3.
- For level 3 cash instrument assets, increases are shown as positive amounts, while decreases are shown as negative amounts. For level 3 cash instrument liabilities, increases are shown as negative amounts, while decreases are shown as positive amounts.
- Level 3 cash instruments are frequently economically hedged with level 1 and level 2 cash instruments and/or level 1, level 2 or level 3 derivatives. Accordingly, gains or losses that are classified in level 3 can be partially offset by gains or losses attributable to level 1 or level 2 cash instruments and/or level 1, level 2 or level 3 derivatives. As a result, gains or losses included in the level 3 rollforward below do not necessarily represent the overall impact on the firm’s results of operations, liquidity or capital resources.

The table below disaggregates, by product type, the information for cash instrument assets included in the summary table above.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Loans and securities backed by commercial real estate** | | |
| Beginning balance | **$ 1,126** | $ 1,645 |
| Net realized gains/(losses) | **67** | 35 |
| Net unrealized gains/(losses) | **6** | 71 |
| Purchases | **133** | 176 |
| Sales | **(126)** | (319) |
| Settlements | **(411)** | (392) |
| Transfers into level 3 | **538** | 141 |
| Transfers out of level 3 | **(314)** | (231) |
| **Ending balance** | **$ 1,019** | $ 1,126 |
| **Loans and securities backed by residential real estate** | | |
| Beginning balance | **$ 668** | $ 845 |
| Net realized gains/(losses) | **53** | 37 |
| Net unrealized gains/(losses) | **16** | 96 |
| Purchases | **119** | 98 |
| Sales | **(209)** | (246) |
| Settlements | **(163)** | (104) |
| Transfers into level 3 | **242** | 21 |
| Transfers out of level 3 | **(63)** | (79) |
| **Ending balance** | **$ 663** | $ 668 |
| **Corporate debt instruments** | | |
| Beginning balance | **$ 3,270** | $ 4,640 |
| Net realized gains/(losses) | **214** | 145 |
| Net unrealized gains/(losses) | **(50)** | (13) |
| Purchases | **941** | 666 |
| Sales | **(480)** | (1,003) |
| Settlements | **(850)** | (1,062) |
| Transfers into level 3 | **1,754** | 1,130 |
| Transfers out of level 3 | **(575)** | (1,233) |
| **Ending balance** | **$ 4,224** | $ 3,270 |
| **Equity securities** | | |
| Beginning balance | **$ 9,904** | $10,263 |
| Net realized gains/(losses) | **157** | 185 |
| Net unrealized gains/(losses) | **776** | 982 |
| Purchases | **990** | 624 |
| Sales | **(1,319)** | (1,702) |
| Settlements | **(1,013)** | (559) |
| Transfers into level 3 | **2,413** | 1,113 |
| Transfers out of level 3 | **(1,183)** | (1,002) |
| **Ending balance** | **$10,725** | $ 9,904 |
| **Other cash instruments** | | |
| Beginning balance | **$ 427** | $ 642 |
| Net realized gains/(losses) | **10** | 17 |
| Net unrealized gains/(losses) | **68** | 8 |
| Purchases | **103** | 71 |
| Sales | **(50)** | (45) |
| Settlements | **(158)** | (148) |
| Transfers into level 3 | **202** | – |
| Transfers out of level 3 | **(6)** | (118) |
| **Ending balance** | **$ 596** | $ 427 |

**Level 3 Rollforward Commentary**

**Year Ended December 2018.** The net realized and unrealized gains on level 3 cash instrument assets of $1.32 billion (reflecting $501 million of net realized gains and $816 million of net unrealized gains) for 2018 included gains/(losses) of $(96) million reported in market making, $908 million reported in other principal transactions and $505 million reported in interest income.

The net unrealized gains on level 3 cash instrument assets for 2018 primarily reflected gains on private equity securities, principally driven by strong corporate performance and company-specific events.

Transfers into level 3 during 2018 primarily reflected transfers of certain private equity securities and corporate debt instruments from level 2, principally due to reduced price transparency as a result of a lack of market evidence, including fewer market transactions in these instruments.

Transfers out of level 3 during 2018 primarily reflected transfers of certain private equity securities and corporate debt instruments to level 2, principally due to increased price transparency as a result of market evidence, including market transactions in these instruments, and transfers of certain other corporate debt instruments to level 2, principally due to certain unobservable yield and duration inputs no longer being significant to the valuation of these instruments.

**Year Ended December 2017.** The net realized and unrealized gains on level 3 cash instrument assets of $1.56 billion (reflecting $419 million of net realized gains and $1.14 billion of net unrealized gains) for 2017 included gains/(losses) of $(99) million reported in market making, $1.13 billion reported in other principal transactions and $532 million reported in interest income.

The net unrealized gains on level 3 cash instrument assets for 2017 primarily reflected gains on private equity securities, principally driven by strong corporate performance and company-specific events.

Transfers into level 3 during 2017 primarily reflected transfers of certain corporate debt instruments and private equity securities from level 2, principally due to reduced price transparency as a result of a lack of market evidence, including fewer market transactions in these instruments.

Transfers out of level 3 during 2017 primarily reflected transfers of certain corporate debt instruments and private equity securities to level 2, principally due to increased price transparency as a result of market evidence, including market transactions in these instruments, and transfers of certain corporate debt instruments to level 2, principally due to certain unobservable yield and duration inputs no longer being significant to the valuation of these instruments.

### Available-for-Sale Securities

The table below presents information about cash instruments that are accounted for as available-for-sale.

| $ in millions | Amortized Cost | Fair Value | Weighted Average Yield |
|---|---|---|---|
| **As of December 2018** | | | |
| Less than 5 years | **$ 5,954** | **$ 5,879** | **2.10%** |
| Greater than 5 years | **6,231** | **6,153** | **2.44%** |
| **Total U.S. government obligations** | **12,185** | **12,032** | **2.28%** |
| **Total available-for-sale securities** | **$12,185** | **$12,032** | **2.28%** |
| As of December 2017 | | | |
| Less than 5 years | $ 3,834 | $ 3,800 | 1.95% |
| Greater than 5 years | 5,207 | 5,222 | 2.41% |
| Total U.S. government obligations | 9,041 | 9,022 | 2.22% |
| Less than 5 years | 19 | 19 | 0.43% |
| Greater than 5 years | 233 | 235 | 4.62% |
| Total other available-for-sale securities | 252 | 254 | 4.30% |
| Total available-for-sale securities | $ 9,293 | $ 9,276 | 2.27% |

In the table above:

- U.S. government obligations were classified in level 1 of the fair value hierarchy as of both December 2018 and December 2017.
- Other available-for-sale securities included corporate debt securities, other debt obligations, securities backed by commercial real estate and money market instruments, substantially all of which were classified in level 2 of the fair value hierarchy as of December 2017.
- The gross unrealized losses included in accumulated other comprehensive loss were $153 million as of December 2018 and were related to U.S. government obligations in a continuous unrealized loss position for greater than a year. Such losses were not material as of December 2017.
- Available-for-sale securities in an unrealized loss position are periodically reviewed for other-than-temporary impairment. The firm considers various factors, including market conditions, changes in issuer credit ratings, severity and duration of the unrealized losses, and the intent and ability to hold the security until recovery to determine if the securities are other-than-temporarily impaired. There were no such impairments during either 2018 or 2017.

### Investments in Funds at Net Asset Value Per Share

Cash instruments at fair value include investments in funds that are measured at NAV of the investment fund. The firm uses NAV to measure the fair value of its fund investments when (i) the fund investment does not have a readily determinable fair value and (ii) the NAV of the investment fund is calculated in a manner consistent with the measurement principles of investment company accounting, including measurement of the investments at fair value.

Substantially all of the firm's investments in funds at NAV consist of investments in firm-sponsored private equity, credit, real estate and hedge funds where the firm co-invests with third-party investors.

Private equity funds primarily invest in a broad range of industries worldwide, including leveraged buyouts, recapitalizations, growth investments and distressed investments. Credit funds generally invest in loans and other fixed income instruments and are focused on providing private high-yield capital for leveraged and management buyout transactions, recapitalizations, financings, refinancings, acquisitions and restructurings for private equity firms, private family companies and corporate issuers. Real estate funds invest globally, primarily in real estate companies, loan portfolios, debt recapitalizations and property. Private equity, credit and real estate funds are closed-end funds in which the firm's investments are generally not eligible for redemption. Distributions will be received from these funds as the underlying assets are liquidated or distributed, the timing of which is uncertain.

The firm also invests in hedge funds, primarily multi-disciplinary hedge funds that employ a fundamental bottom-up investment approach across various asset classes and strategies. The firm's investments in hedge funds primarily include interests where the underlying assets are illiquid in nature, and proceeds from redemptions will not be received until the underlying assets are liquidated or distributed, the timing of which is uncertain.

Many of the funds described above are "covered funds" as defined in the Volcker Rule of the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). The Board of Governors of the Federal Reserve System (FRB) extended the conformance period to July 2022 for the firm's investments in, and relationships with, certain legacy "illiquid funds" (as defined in the Volcker Rule) that were in place prior to December 2013. This extension is applicable to substantially all of the firm's remaining investments in, and relationships with, such covered funds.

The table below presents the fair value of investments in funds at NAV and the related unfunded commitments.

| *$ in millions* | Fair Value of Investments | Unfunded Commitments |
|---|---|---|
| **As of December 2018** | | |
| Private equity funds | **$2,683** | **$ 809** |
| Credit funds | **548** | **1,099** |
| Hedge funds | **161** | **–** |
| Real estate funds | **544** | **203** |
| **Total** | **$3,936** | **$2,111** |
| As of December 2017 | | |
| Private equity funds | $3,478 | $ 614 |
| Credit funds | 266 | 985 |
| Hedge funds | 223 | – |
| Real estate funds | 629 | 201 |
| Total | $4,596 | $1,800 |

### Note 7.

## Derivatives and Hedging Activities

### Derivative Activities

Derivatives are instruments that derive their value from underlying asset prices, indices, reference rates and other inputs, or a combination of these factors. Derivatives may be traded on an exchange (exchange-traded) or they may be privately negotiated contracts, which are usually referred to as OTC derivatives. Certain of the firm's OTC derivatives are cleared and settled through central clearing counterparties (OTC-cleared), while others are bilateral contracts between two counterparties (bilateral OTC).

**Market Making.** As a market maker, the firm enters into derivative transactions to provide liquidity to clients and to facilitate the transfer and hedging of their risks. In this role, the firm typically acts as principal and is required to commit capital to provide execution, and maintains inventory in response to, or in anticipation of, client demand.

**Risk Management.** The firm also enters into derivatives to actively manage risk exposures that arise from its market-making and investing and lending activities in derivative and cash instruments. The firm's holdings and exposures are hedged, in many cases, on either a portfolio or risk-specific basis, as opposed to an instrument-by-instrument basis. The offsetting impact of this economic hedging is reflected in the same business segment as the related revenues. In addition, the firm may enter into derivatives designated as hedges under U.S. GAAP. These derivatives are used to manage interest rate exposure in certain fixed-rate unsecured long-term and short-term borrowings, and deposits, and to manage foreign currency exposure on the net investment in certain non-U.S. operations.

The firm enters into various types of derivatives, including:

- **Futures and Forwards.** Contracts that commit counterparties to purchase or sell financial instruments, commodities or currencies in the future.
- **Swaps.** Contracts that require counterparties to exchange cash flows such as currency or interest payment streams. The amounts exchanged are based on the specific terms of the contract with reference to specified rates, financial instruments, commodities, currencies or indices.
- **Options.** Contracts in which the option purchaser has the right, but not the obligation, to purchase from or sell to the option writer financial instruments, commodities or currencies within a defined time period for a specified price.

Derivatives are reported on a net-by-counterparty basis (i.e., the net payable or receivable for derivative assets and liabilities for a given counterparty) when a legal right of setoff exists under an enforceable netting agreement (counterparty netting). Derivatives are accounted for at fair value, net of cash collateral received or posted under enforceable credit support agreements (cash collateral netting). Derivative assets are included in financial instruments owned and derivative liabilities are included in financial instruments sold, but not yet purchased. Realized and unrealized gains and losses on derivatives not designated as hedges are included in market making and other principal transactions in Note 4.

The tables below present the gross fair value and the notional amounts of derivative contracts by major product type, the amounts of counterparty and cash collateral netting in the consolidated statements of financial condition, as well as cash and securities collateral posted and received under enforceable credit support agreements that do not meet the criteria for netting under U.S. GAAP.

| | As of December 2018 | | As of December 2017 | |
|---|---|---|---|---|
| *$ in millions* | **Derivative Assets** | **Derivative Liabilities** | Derivative Assets | Derivative Liabilities |
| **Not accounted for as hedges** | | | | |
| Exchange-traded | **$ 760** | **$ 1,553** | $ 554 | $ 644 |
| OTC-cleared | **5,040** | **3,552** | 5,392 | 2,773 |
| Bilateral OTC | **227,274** | **211,091** | 274,986 | 249,750 |
| **Total interest rates** | **233,074** | **216,196** | 280,932 | 253,167 |
| OTC-cleared | **4,778** | **4,517** | 5,727 | 5,670 |
| Bilateral OTC | **14,658** | **13,784** | 16,966 | 15,600 |
| **Total credit** | **19,436** | **18,301** | 22,693 | 21,270 |
| Exchange-traded | **11** | **16** | 23 | 363 |
| OTC-cleared | **656** | **800** | 988 | 847 |
| Bilateral OTC | **85,772** | **87,953** | 94,481 | 95,127 |
| **Total currencies** | **86,439** | **88,769** | 95,492 | 96,337 |
| Exchange-traded | **4,445** | **4,093** | 4,135 | 3,854 |
| OTC-cleared | **433** | **439** | 197 | 197 |
| Bilateral OTC | **12,746** | **15,595** | 9,748 | 12,097 |
| **Total commodities** | **17,624** | **20,127** | 14,080 | 16,148 |
| Exchange-traded | **13,431** | **11,765** | 10,552 | 10,335 |
| Bilateral OTC | **34,687** | **40,668** | 40,735 | 45,253 |
| **Total equities** | **48,118** | **52,433** | 51,287 | 55,588 |
| **Subtotal** | **404,691** | **395,826** | 464,484 | 442,510 |
| **Accounted for as hedges** | | | | |
| OTC-cleared | **2** | **–** | 21 | – |
| Bilateral OTC | **3,024** | **7** | 2,309 | 3 |
| **Total interest rates** | **3,026** | **7** | 2,330 | 3 |
| OTC-cleared | **25** | **53** | 15 | 30 |
| Bilateral OTC | **54** | **61** | 34 | 114 |
| **Total currencies** | **79** | **114** | 49 | 144 |
| **Subtotal** | **3,105** | **121** | 2,379 | 147 |
| **Total gross fair value** | **$ 407,796** | **$ 395,947** | $ 466,863 | $ 442,657 |
| **Offset in consolidated statements of financial condition** | | | | |
| Exchange-traded | **$ (14,377)** | **$ (14,377)** | $ (12,963) | $ (12,963) |
| OTC-cleared | **(8,888)** | **(8,888)** | (9,267) | (9,267) |
| Bilateral OTC | **(290,961)** | **(290,961)** | (341,824) | (341,824) |
| **Counterparty netting** | **(314,226)** | **(314,226)** | (364,054) | (364,054) |
| OTC-cleared | **(1,389)** | **(164)** | (2,423) | (180) |
| Bilateral OTC | **(47,335)** | **(38,963)** | (53,049) | (38,792) |
| **Cash collateral netting** | **(48,724)** | **(39,127)** | (55,472) | (38,972) |
| **Total amounts offset** | **$(362,950)** | **$(353,353)** | $(419,526) | $(403,026) |
| **Included in consolidated statements of financial condition** | | | | |
| Exchange-traded | **$ 4,270** | **$ 3,050** | $ 2,301 | $ 2,233 |
| OTC-cleared | **657** | **309** | 650 | 70 |
| Bilateral OTC | **39,919** | **39,235** | 44,386 | 37,328 |
| **Total** | **$ 44,846** | **$ 42,594** | $ 47,337 | $ 39,631 |
| **Not offset in consolidated statements of financial condition** | | | | |
| Cash collateral | **$ (614)** | **$ (1,328)** | $ (602) | $ (2,375) |
| Securities collateral | **(12,740)** | **(8,414)** | (13,947) | (8,722) |
| **Total** | **$ 31,492** | **$ 32,852** | $ 32,788 | $ 28,534 |

| | Notional Amounts as of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Not accounted for as hedges** | | |
| Exchange-traded | **$ 5,139,159** | $10,212,510 |
| OTC-cleared | **14,290,327** | 14,739,556 |
| Bilateral OTC | **12,858,248** | 12,862,328 |
| **Total interest rates** | **32,287,734** | 37,814,394 |
| OTC-cleared | **394,494** | 386,163 |
| Bilateral OTC | **762,653** | 868,226 |
| **Total credit** | **1,157,147** | 1,254,389 |
| Exchange-traded | **5,599** | 10,450 |
| OTC-cleared | **113,360** | 98,549 |
| Bilateral OTC | **6,596,741** | 7,331,516 |
| **Total currencies** | **6,715,700** | 7,440,515 |
| Exchange-traded | **259,287** | 239,749 |
| OTC-cleared | **1,516** | 3,925 |
| Bilateral OTC | **244,958** | 250,547 |
| **Total commodities** | **505,761** | 494,221 |
| Exchange-traded | **635,988** | 655,485 |
| Bilateral OTC | **1,070,211** | 1,127,812 |
| **Total equities** | **1,706,199** | 1,783,297 |
| **Subtotal** | **42,372,541** | 48,786,816 |
| **Accounted for as hedges** | | |
| OTC-cleared | **85,681** | 52,785 |
| Bilateral OTC | **12,022** | 15,188 |
| **Total interest rates** | **97,703** | 67,973 |
| OTC-cleared | **2,911** | 2,210 |
| Bilateral OTC | **8,089** | 8,347 |
| **Total currencies** | **11,000** | 10,557 |
| **Subtotal** | **108,703** | 78,530 |
| **Total notional amounts** | **$42,481,244** | $48,865,346 |

In the tables above:

- Gross fair values exclude the effects of both counterparty netting and collateral, and therefore are not representative of the firm's exposure.
- Where the firm has received or posted collateral under credit support agreements, but has not yet determined such agreements are enforceable, the related collateral has not been netted.
- Notional amounts, which represent the sum of gross long and short derivative contracts, provide an indication of the volume of the firm's derivative activity and do not represent anticipated losses.
- Total gross fair value of derivatives included derivative assets of $10.68 billion as of December 2018 and $11.24 billion as of December 2017, and derivative liabilities of $11.95 billion as of December 2018 and $13.00 billion as of December 2017, which are not subject to an enforceable netting agreement or are subject to a netting agreement that the firm has not yet determined to be enforceable.
- During the second quarter of 2018, consistent with the rules of a clearing organization, the firm elected to consider its transactions with that clearing organization as settled each day. As of December 2017, the impact of this change would have been a reduction in gross interest rate derivative assets of $3.6 billion and gross interest rate derivative liabilities of $1.9 billion, and a corresponding decrease in counterparty and cash collateral netting, with no impact to the consolidated statements of financial condition.

- On November 19, 2018, a clearing organization revised its rules to calculate notional amounts for certain exchange-traded derivative contracts. The impact of this rule change, as of the effective date, was a decrease in the notional amounts of derivative contracts of approximately $7 trillion, substantially all of which related to interest rate derivatives, with no change to their fair value.

### Valuation Techniques for Derivatives

The firm's level 2 and level 3 derivatives are valued using derivative pricing models (e.g., discounted cash flow models, correlation models, and models that incorporate option pricing methodologies, such as Monte Carlo simulations). Price transparency of derivatives can generally be characterized by product type, as described below.

- **Interest Rate.** In general, the key inputs used to value interest rate derivatives are transparent, even for most long-dated contracts. Interest rate swaps and options denominated in the currencies of leading industrialized nations are characterized by high trading volumes and tight bid/offer spreads. Interest rate derivatives that reference indices, such as an inflation index, or the shape of the yield curve (e.g., 10-year swap rate vs. 2-year swap rate) are more complex, but the key inputs are generally observable.

- **Credit.** Price transparency for credit default swaps, including both single names and baskets of credits, varies by market and underlying reference entity or obligation. Credit default swaps that reference indices, large corporates and major sovereigns generally exhibit the most price transparency. For credit default swaps with other underliers, price transparency varies based on credit rating, the cost of borrowing the underlying reference obligations, and the availability of the underlying reference obligations for delivery upon the default of the issuer. Credit default swaps that reference loans, asset-backed securities and emerging market debt instruments tend to have less price transparency than those that reference corporate bonds. In addition, more complex credit derivatives, such as those sensitive to the correlation between two or more underlying reference obligations, generally have less price transparency.

- **Currency.** Prices for currency derivatives based on the exchange rates of leading industrialized nations, including those with longer tenors, are generally transparent. The primary difference between the price transparency of developed and emerging market currency derivatives is that emerging markets tend to be observable for contracts with shorter tenors.

- **Commodity.** Commodity derivatives include transactions referenced to energy (e.g., oil and natural gas), metals (e.g., precious and base) and soft commodities (e.g., agricultural). Price transparency varies based on the underlying commodity, delivery location, tenor and product quality (e.g., diesel fuel compared to unleaded gasoline). In general, price transparency for commodity derivatives is greater for contracts with shorter tenors and contracts that are more closely aligned with major and/or benchmark commodity indices.

- **Equity.** Price transparency for equity derivatives varies by market and underlier. Options on indices and the common stock of corporates included in major equity indices exhibit the most price transparency. Equity derivatives generally have observable market prices, except for contracts with long tenors or reference prices that differ significantly from current market prices. More complex equity derivatives, such as those sensitive to the correlation between two or more individual stocks, generally have less price transparency.

Liquidity is essential to observability of all product types. If transaction volumes decline, previously transparent prices and other inputs may become unobservable. Conversely, even highly structured products may at times have trading volumes large enough to provide observability of prices and other inputs. See Note 5 for an overview of the firm's fair value measurement policies.

### Level 1 Derivatives

Level 1 derivatives include short-term contracts for future delivery of securities when the underlying security is a level 1 instrument, and exchange-traded derivatives if they are actively traded and are valued at their quoted market price.

### Level 2 Derivatives

Level 2 derivatives include OTC derivatives for which all significant valuation inputs are corroborated by market evidence and exchange-traded derivatives that are not actively traded and/or that are valued using models that calibrate to market-clearing levels of OTC derivatives.

The selection of a particular model to value a derivative depends on the contractual terms of and specific risks inherent in the instrument, as well as the availability of pricing information in the market. For derivatives that trade in liquid markets, model selection does not involve significant management judgment because outputs of models can be calibrated to market-clearing levels.

Valuation models require a variety of inputs, such as contractual terms, market prices, yield curves, discount rates (including those derived from interest rates on collateral received and posted as specified in credit support agreements for collateralized derivatives), credit curves, measures of volatility, prepayment rates, loss severity rates and correlations of such inputs. Significant inputs to the valuations of level 2 derivatives can be verified to market transactions, broker or dealer quotations or other alternative pricing sources with reasonable levels of price transparency. Consideration is given to the nature of the quotations (e.g., indicative or firm) and the relationship of recent market activity to the prices provided from alternative pricing sources.

**Level 3 Derivatives**

Level 3 derivatives are valued using models which utilize observable level 1 and/or level 2 inputs, as well as unobservable level 3 inputs. The significant unobservable inputs used to value the firm's level 3 derivatives are described below.

- For level 3 interest rate and currency derivatives, significant unobservable inputs include correlations of certain currencies and interest rates (e.g., the correlation between Euro inflation and Euro interest rates). In addition, for level 3 interest rate derivatives, significant unobservable inputs include specific interest rate volatilities.
- For level 3 credit derivatives, significant unobservable inputs include illiquid credit spreads and upfront credit points, which are unique to specific reference obligations and reference entities, recovery rates and certain correlations required to value credit derivatives (e.g., the likelihood of default of the underlying reference obligation relative to one another).
- For level 3 commodity derivatives, significant unobservable inputs include volatilities for options with strike prices that differ significantly from current market prices and prices or spreads for certain products for which the product quality or physical location of the commodity is not aligned with benchmark indices.
- For level 3 equity derivatives, significant unobservable inputs generally include equity volatility inputs for options that are long-dated and/or have strike prices that differ significantly from current market prices. In addition, the valuation of certain structured trades requires the use of level 3 correlation inputs, such as the correlation of the price performance of two or more individual stocks or the correlation of the price performance for a basket of stocks to another asset class such as commodities.

Subsequent to the initial valuation of a level 3 derivative, the firm updates the level 1 and level 2 inputs to reflect observable market changes and any resulting gains and losses are classified in level 3. Level 3 inputs are changed when corroborated by evidence such as similar market transactions, third-party pricing services and/or broker or dealer quotations or other empirical market data. In circumstances where the firm cannot verify the model value by reference to market transactions, it is possible that a different valuation model could produce a materially different estimate of fair value. See below for further information about significant unobservable inputs used in the valuation of level 3 derivatives.

**Valuation Adjustments**

Valuation adjustments are integral to determining the fair value of derivative portfolios and are used to adjust the mid-market valuations produced by derivative pricing models to the appropriate exit price valuation. These adjustments incorporate bid/offer spreads, the cost of liquidity, credit valuation adjustments and funding valuation adjustments, which account for the credit and funding risk inherent in the uncollateralized portion of derivative portfolios. The firm also makes funding valuation adjustments to collateralized derivatives where the terms of the agreement do not permit the firm to deliver or repledge collateral received. Market-based inputs are generally used when calibrating valuation adjustments to market-clearing levels.

In addition, for derivatives that include significant unobservable inputs, the firm makes model or exit price adjustments to account for the valuation uncertainty present in the transaction.

### Fair Value of Derivatives by Level

The table below presents the fair value of derivatives on a gross basis by level and major product type, as well as the impact of netting.

| $ in millions | Level 1 | Level 2 | Level 3 | Total |
|---|---|---|---|---|
| **As of December 2018** | | | | |
| **Assets** | | | | |
| Interest rates | **$ 12** | **$ 235,680** | **$ 408** | **$ 236,100** |
| Credit | **–** | **15,992** | **3,444** | **19,436** |
| Currencies | **–** | **85,837** | **681** | **86,518** |
| Commodities | **–** | **17,193** | **431** | **17,624** |
| Equities | **10** | **47,168** | **940** | **48,118** |
| Gross fair value | **22** | **401,870** | **5,904** | **407,796** |
| Counterparty netting in levels | **–** | **(312,611)** | **(956)** | **(313,567)** |
| Subtotal | **$ 22** | **$ 89,259** | **$ 4,948** | **$ 94,229** |
| Cross-level counterparty netting | | | | **(659)** |
| Cash collateral netting | | | | **(48,724)** |
| **Net fair value** | | | | **$ 44,846** |
| **Liabilities** | | | | |
| Interest rates | **$(24)** | **$(215,662)** | **$ (517)** | **$(216,203)** |
| Credit | **–** | **(16,529)** | **(1,772)** | **(18,301)** |
| Currencies | **–** | **(88,663)** | **(220)** | **(88,883)** |
| Commodities | **–** | **(19,808)** | **(319)** | **(20,127)** |
| Equities | **(37)** | **(49,910)** | **(2,486)** | **(52,433)** |
| Gross fair value | **(61)** | **(390,572)** | **(5,314)** | **(395,947)** |
| Counterparty netting in levels | **–** | **312,611** | **956** | **313,567** |
| Subtotal | **$(61)** | **$ (77,961)** | **$(4,358)** | **$ (82,380)** |
| Cross-level counterparty netting | | | | **659** |
| Cash collateral netting | | | | **39,127** |
| **Net fair value** | | | | **$ (42,594)** |
| As of December 2017 | | | | |
| **Assets** | | | | |
| Interest rates | $ 18 | $ 282,933 | $ 311 | $ 283,262 |
| Credit | – | 19,053 | 3,640 | 22,693 |
| Currencies | – | 95,401 | 140 | 95,541 |
| Commodities | – | 13,727 | 353 | 14,080 |
| Equities | 8 | 50,870 | 409 | 51,287 |
| Gross fair value | 26 | 461,984 | 4,853 | 466,863 |
| Counterparty netting in levels | – | (362,109) | (1,051) | (363,160) |
| Subtotal | $ 26 | $ 99,875 | $ 3,802 | $ 103,703 |
| Cross-level counterparty netting | | | | (894) |
| Cash collateral netting | | | | (55,472) |
| Net fair value | | | | $ 47,337 |
| **Liabilities** | | | | |
| Interest rates | $(28) | $(252,421) | $ (721) | $(253,170) |
| Credit | – | (19,135) | (2,135) | (21,270) |
| Currencies | – | (96,160) | (321) | (96,481) |
| Commodities | – | (15,842) | (306) | (16,148) |
| Equities | (28) | (53,902) | (1,658) | (55,588) |
| Gross fair value | (56) | (437,460) | (5,141) | (442,657) |
| Counterparty netting in levels | – | 362,109 | 1,051 | 363,160 |
| Subtotal | $(56) | $ (75,351) | $(4,090) | $ (79,497) |
| Cross-level counterparty netting | | | | 894 |
| Cash collateral netting | | | | 38,972 |
| Net fair value | | | | $ (39,631) |

In the table above:

- The gross fair values exclude the effects of both counterparty netting and collateral netting, and therefore are not representative of the firm's exposure.
- Counterparty netting is reflected in each level to the extent that receivable and payable balances are netted within the same level and is included in counterparty netting in levels. Where the counterparty netting is across levels, the netting is included in cross-level counterparty netting.
- Derivative assets are shown as positive amounts and derivative liabilities are shown as negative amounts.

### Significant Unobservable Inputs

The table below presents the amount of level 3 assets (liabilities), and ranges, averages and medians of significant unobservable inputs used to value level 3 derivatives.

| | Level 3 Assets (Liabilities) and Range of Significant Unobservable Inputs (Average/Median) as of December | |
|---|---|---|
| $ in millions | **2018** | 2017 |
| **Interest rates, net** | **$(109)** | $(410) |
| Correlation | **(10)% to 86% (66%/64%)** | (10)% to 95% (71%/79%) |
| Volatility (bps) | **31 to 150 (74/65)** | 31 to 150 (84/78) |
| **Credit, net** | **$1,672** | $1,505 |
| Correlation | **N/A** | 28% to 84% (61%/60%) |
| Credit spreads (bps) | **1 to 810 (109/63)** | 1 to 633 (69/42) |
| Upfront credit points | **2 to 99 (44/40)** | 0 to 97 (42/38) |
| Recovery rates | **25% to 70% (40%/40%)** | 22% to 73% (68%/73%) |
| **Currencies, net** | **$461** | $(181) |
| Correlation | **10% to 70% (40%/36%)** | 49% to 72% (61%/62%) |
| **Commodities, net** | **$112** | $47 |
| Volatility | **10% to 75% (28%/27%)** | 9% to 79% (24%/24%) |
| Natural gas spread | **$(2.32) to $4.68 ($(0.26)/$(0.30))** | $(2.38) to $3.34 ($(0.22)/$(0.12)) |
| Oil spread | **$(3.44) to $16.62 ($4.53/$3.94)** | $(2.86) to $23.61 ($6.47/$2.35) |
| **Equities, net** | **$(1,546)** | $(1,249) |
| Correlation | **(68)% to 97% (48%/51%)** | (36)% to 94% (50%/52%) |
| Volatility | **3% to 102% (20%/18%)** | 4% to 72% (24%/22%) |

In the table above:

- Derivative assets are shown as positive amounts and derivative liabilities are shown as negative amounts.
- Ranges represent the significant unobservable inputs that were used in the valuation of each type of derivative.
- Averages represent the arithmetic average of the inputs and are not weighted by the relative fair value or notional of the respective financial instruments. An average greater than the median indicates that the majority of inputs are below the average. For example, the difference between the average and the median for credit spreads indicates that the majority of the inputs fall in the lower end of the range.

- The ranges, averages and medians of these inputs are not representative of the appropriate inputs to use when calculating the fair value of any one derivative. For example, the highest correlation for interest rate derivatives is appropriate for valuing a specific interest rate derivative but may not be appropriate for valuing any other interest rate derivative. Accordingly, the ranges of inputs do not represent uncertainty in, or possible ranges of, fair value measurements of level 3 derivatives.
- Interest rates, currencies and equities derivatives are valued using option pricing models, credit derivatives are valued using option pricing, correlation and discounted cash flow models, and commodities derivatives are valued using option pricing and discounted cash flow models.
- The fair value of any one instrument may be determined using multiple valuation techniques. For example, option pricing models and discounted cash flows models are typically used together to determine fair value. Therefore, the level 3 balance encompasses both of these techniques.
- Correlation was not significant to the valuation of level 3 credit derivatives as of December 2018.
- Correlation within currencies and equities includes cross-product type correlation.
- Natural gas spread represents the spread per million British thermal units of natural gas.
- Oil spread represents the spread per barrel of oil and refined products.

### Range of Significant Unobservable Inputs

The following is information about the ranges of significant unobservable inputs used to value the firm's level 3 derivative instruments:

- **Correlation.** Ranges for correlation cover a variety of underliers both within one product type (e.g., equity index and equity single stock names) and across product types (e.g., correlation of an interest rate and a currency), as well as across regions. Generally, cross-product type correlation inputs are used to value more complex instruments and are lower than correlation inputs on assets within the same derivative product type.
- **Volatility.** Ranges for volatility cover numerous underliers across a variety of markets, maturities and strike prices. For example, volatility of equity indices is generally lower than volatility of single stocks.
- **Credit spreads, upfront credit points and recovery rates.** The ranges for credit spreads, upfront credit points and recovery rates cover a variety of underliers (index and single names), regions, sectors, maturities and credit qualities (high-yield and investment-grade). The broad range of this population gives rise to the width of the ranges of significant unobservable inputs.
- **Commodity prices and spreads.** The ranges for commodity prices and spreads cover variability in products, maturities and delivery locations.

### Sensitivity of Fair Value Measurement to Changes in Significant Unobservable Inputs

The following is a description of the directional sensitivity of the firm's level 3 fair value measurements, as of both December 2018 and December 2017, to changes in significant unobservable inputs, in isolation:

- **Correlation.** In general, for contracts where the holder benefits from the convergence of the underlying asset or index prices (e.g., interest rates, credit spreads, foreign exchange rates, inflation rates and equity prices), an increase in correlation results in a higher fair value measurement.
- **Volatility.** In general, for purchased options, an increase in volatility results in a higher fair value measurement.
- **Credit spreads, upfront credit points and recovery rates.** In general, the fair value of purchased credit protection increases as credit spreads or upfront credit points increase or recovery rates decrease. Credit spreads, upfront credit points and recovery rates are strongly related to distinctive risk factors of the underlying reference obligations, which include reference entity-specific factors such as leverage, volatility and industry, market-based risk factors, such as borrowing costs or liquidity of the underlying reference obligation, and macroeconomic conditions.
- **Commodity prices and spreads.** In general, for contracts where the holder is receiving a commodity, an increase in the spread (price difference from a benchmark index due to differences in quality or delivery location) or price results in a higher fair value measurement.

Due to the distinctive nature of each of the firm's level 3 derivatives, the interrelationship of inputs is not necessarily uniform within each product type.

### Level 3 Rollforward

The table below presents a summary of the changes in fair value for level 3 derivatives.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Total level 3 derivatives** | | |
| Beginning balance | **$ (288)** | $(1,217) |
| Net realized gains/(losses) | **(113)** | (119) |
| Net unrealized gains/(losses) | **1,251** | (436) |
| Purchases | **612** | 301 |
| Sales | **(1,510)** | (611) |
| Settlements | **573** | 1,891 |
| Transfers into level 3 | **34** | (39) |
| Transfers out of level 3 | **31** | (58) |
| **Ending balance** | **$ 590** | $ (288) |

In the table above:

- Changes in fair value are presented for all derivative assets and liabilities that are classified in level 3 as of the end of the period.
- Net unrealized gains/(losses) relates to instruments that were still held at period-end.
- Transfers between levels of the fair value hierarchy are reported at the beginning of the reporting period in which they occur. If a derivative was transferred into level 3 during a reporting period, its entire gain or loss for the period is classified in level 3.
- Positive amounts for transfers into level 3 and negative amounts for transfers out of level 3 represent net transfers of derivative assets. Negative amounts for transfers into level 3 and positive amounts for transfers out of level 3 represent net transfers of derivative liabilities.
- A derivative with level 1 and/or level 2 inputs is classified in level 3 in its entirety if it has at least one significant level 3 input.
- If there is one significant level 3 input, the entire gain or loss from adjusting only observable inputs (i.e., level 1 and level 2 inputs) is classified in level 3.
- Gains or losses that have been classified in level 3 resulting from changes in level 1 or level 2 inputs are frequently offset by gains or losses attributable to level 1 or level 2 derivatives and/or level 1, level 2 and level 3 cash instruments. As a result, gains/(losses) included in the level 3 rollforward below do not necessarily represent the overall impact on the firm's results of operations, liquidity or capital resources.

The table below disaggregates, by major product type, the information for level 3 derivatives included in the summary table above.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Interest rates, net** | | |
| Beginning balance | **$ (410)** | $ (381) |
| Net realized gains/(losses) | **(51)** | (62) |
| Net unrealized gains/(losses) | **122** | 20 |
| Purchases | **8** | 4 |
| Sales | **(2)** | (14) |
| Settlements | **171** | 30 |
| Transfers into level 3 | **(9)** | (12) |
| Transfers out of level 3 | **62** | 5 |
| **Ending balance** | **$ (109)** | $ (410) |
| **Credit, net** | | |
| Beginning balance | **$ 1,505** | $ 2,504 |
| Net realized gains/(losses) | **(23)** | 42 |
| Net unrealized gains/(losses) | **2** | (188) |
| Purchases | **53** | 20 |
| Sales | **(65)** | (27) |
| Settlements | **244** | (739) |
| Transfers into level 3 | **(35)** | 3 |
| Transfers out of level 3 | **(9)** | (110) |
| **Ending balance** | **$ 1,672** | $ 1,505 |
| **Currencies, net** | | |
| Beginning balance | **$ (181)** | $ 3 |
| Net realized gains/(losses) | **(51)** | (39) |
| Net unrealized gains/(losses) | **372** | (192) |
| Purchases | **36** | 4 |
| Sales | **(25)** | (3) |
| Settlements | **212** | 62 |
| Transfers into level 3 | **101** | (9) |
| Transfers out of level 3 | **(3)** | (7) |
| **Ending balance** | **$ 461** | $ (181) |
| **Commodities, net** | | |
| Beginning balance | **$ 47** | $ 73 |
| Net realized gains/(losses) | **18** | (4) |
| Net unrealized gains/(losses) | **61** | 216 |
| Purchases | **42** | 102 |
| Sales | **(64)** | (301) |
| Settlements | **12** | (27) |
| Transfers into level 3 | **21** | (25) |
| Transfers out of level 3 | **(25)** | 13 |
| **Ending balance** | **$ 112** | $ 47 |
| **Equities, net** | | |
| Beginning balance | **$(1,249)** | $(3,416) |
| Net realized gains/(losses) | **(6)** | (56) |
| Net unrealized gains/(losses) | **694** | (292) |
| Purchases | **473** | 171 |
| Sales | **(1,354)** | (266) |
| Settlements | **(66)** | 2,565 |
| Transfers into level 3 | **(44)** | 4 |
| Transfers out of level 3 | **6** | 41 |
| **Ending balance** | **$(1,546)** | $(1,249) |

### Level 3 Rollforward Commentary

**Year Ended December 2018.** The net realized and unrealized gains on level 3 derivatives of $1.14 billion (reflecting $113 million of net realized losses and $1.25 billion of net unrealized gains) for 2018 included gains of $1.11 billion reported in market making and $28 million reported in other principal transactions.

The net unrealized gains on level 3 derivatives for 2018 were primarily attributable to gains on certain equity derivatives, reflecting the impact of a decrease in certain equity prices and gains on certain currency derivatives, primarily reflecting the impact of changes in foreign exchange rates.

Both transfers into level 3 derivatives and transfers out of level 3 derivatives during 2018 were not material.

**Year Ended December 2017.** The net realized and unrealized losses on level 3 derivatives of $555 million (reflecting $119 million of net realized losses and $436 million of net unrealized losses) for 2017 included losses of $90 million reported in market making and $465 million reported in other principal transactions.

The net unrealized losses on level 3 derivatives for 2017 were primarily attributable to losses on certain equity derivatives, reflecting the impact of changes in equity prices, losses on certain currency derivatives, primarily reflecting the impact of changes in foreign exchanges rates, and losses on certain credit derivatives, reflecting the impact of tighter credit spreads, partially offset by gains on certain commodity derivatives, reflecting the impact of an increase in commodity prices.

Transfers into level 3 derivatives during 2017 were not material.

Transfers out of level 3 derivatives during 2017 primarily reflected transfers of certain credit derivatives assets to level 2, principally due to certain unobservable inputs no longer being significant to the valuation of these derivatives.

### OTC Derivatives

The table below presents the fair values of OTC derivative assets and liabilities by tenor and major product type.

| *$ in millions* | Less than 1 Year | 1 - 5 Years | Greater than 5 Years | Total |
|---|---|---|---|---|
| **As of December 2018** | | | | |
| **Assets** | | | | |
| Interest rates | **$ 2,810** | **$13,177** | **$47,426** | **$ 63,413** |
| Credit | **807** | **3,676** | **3,364** | **7,847** |
| Currencies | **10,976** | **5,076** | **6,486** | **22,538** |
| Commodities | **4,978** | **2,101** | **145** | **7,224** |
| Equities | **4,962** | **5,244** | **1,329** | **11,535** |
| Counterparty netting in tenors | **(3,409)** | **(3,883)** | **(2,822)** | **(10,114)** |
| Subtotal | **$21,124** | **$25,391** | **$55,928** | **$102,443** |
| Cross-tenor counterparty netting | | | | **(13,143)** |
| Cash collateral netting | | | | **(48,724)** |
| **Total OTC derivative assets** | | | | **$40,576** |
| **Liabilities** | | | | |
| Interest rates | **$ 4,193** | **$ 9,153** | **$29,377** | **$ 42,723** |
| Credit | **1,127** | **4,173** | **1,412** | **6,712** |
| Currencies | **13,553** | **6,871** | **4,474** | **24,898** |
| Commodities | **4,271** | **2,663** | **3,145** | **10,079** |
| Equities | **9,278** | **5,178** | **3,060** | **17,516** |
| Counterparty netting in tenors | **(3,409)** | **(3,883)** | **(2,822)** | **(10,114)** |
| Subtotal | **$29,013** | **$24,155** | **$38,646** | **$ 91,814** |
| Cross-tenor counterparty netting | | | | **(13,143)** |
| Cash collateral netting | | | | **(39,127)** |
| **Total OTC derivative liabilities** | | | | **$ 39,544** |
| As of December 2017 | | | | |
| **Assets** | | | | |
| Interest rates | $ 3,717 | $15,445 | $57,200 | $ 76,362 |
| Credit | 760 | 4,079 | 3,338 | 8,177 |
| Currencies | 12,184 | 6,219 | 7,245 | 25,648 |
| Commodities | 3,175 | 2,526 | 181 | 5,882 |
| Equities | 4,969 | 5,607 | 1,387 | 11,963 |
| Counterparty netting in tenors | (3,719) | (4,594) | (2,807) | (11,120) |
| Subtotal | $21,086 | $29,282 | $66,544 | $116,912 |
| Cross-tenor counterparty netting | | | | (16,404) |
| Cash collateral netting | | | | (55,472) |
| Total OTC derivative assets | | | | $ 45,036 |
| **Liabilities** | | | | |
| Interest rates | $ 4,517 | $ 8,471 | $33,193 | $46,181 |
| Credit | 2,078 | 3,588 | 1,088 | 6,754 |
| Currencies | 14,326 | 7,119 | 4,802 | 26,247 |
| Commodities | 3,599 | 2,167 | 2,465 | 8,231 |
| Equities | 6,453 | 6,647 | 3,381 | 16,481 |
| Counterparty netting in tenors | (3,719) | (4,594) | (2,807) | (11,120) |
| Subtotal | $27,254 | $23,398 | $42,122 | $ 92,774 |
| Cross-tenor counterparty netting | | | | (16,404) |
| Cash collateral netting | | | | (38,972) |
| Total OTC derivative liabilities | | | | $ 37,398 |

In the table above:

- Tenor is based on remaining contractual maturity.
- Counterparty netting within the same product type and tenor category is included within such product type and tenor category.
- Counterparty netting across product types within the same tenor category is included in counterparty netting in tenors. Where the counterparty netting is across tenor categories, the netting is included in cross-tenor counterparty netting.

### Credit Derivatives

The firm enters into a broad array of credit derivatives in locations around the world to facilitate client transactions and to manage the credit risk associated with market-making and investing and lending activities. Credit derivatives are actively managed based on the firm's net risk position. Credit derivatives are generally individually negotiated contracts and can have various settlement and payment conventions. Credit events include failure to pay, bankruptcy, acceleration of indebtedness, restructuring, repudiation and dissolution of the reference entity.

The firm enters into the following types of credit derivatives:

- **Credit Default Swaps.** Single-name credit default swaps protect the buyer against the loss of principal on one or more bonds, loans or mortgages (reference obligations) in the event the issuer of the reference obligations suffers a credit event. The buyer of protection pays an initial or periodic premium to the seller and receives protection for the period of the contract. If there is no credit event, as defined in the contract, the seller of protection makes no payments to the buyer. If a credit event occurs, the seller of protection is required to make a payment to the buyer, calculated according to the terms of the contract.

- **Credit Options.** In a credit option, the option writer assumes the obligation to purchase or sell a reference obligation at a specified price or credit spread. The option purchaser buys the right, but does not assume the obligation, to sell the reference obligation to, or purchase it from, the option writer. The payments on credit options depend either on a particular credit spread or the price of the reference obligation.

- **Credit Indices, Baskets and Tranches.** Credit derivatives may reference a basket of single-name credit default swaps or a broad-based index. If a credit event occurs in one of the underlying reference obligations, the protection seller pays the protection buyer. The payment is typically a pro-rata portion of the transaction's total notional amount based on the underlying defaulted reference obligation. In certain transactions, the credit risk of a basket or index is separated into various portions (tranches), each having different levels of subordination. The most junior tranches cover initial defaults and once losses exceed the notional amount of these junior tranches, any excess loss is covered by the next most senior tranche.

- **Total Return Swaps.** A total return swap transfers the risks relating to economic performance of a reference obligation from the protection buyer to the protection seller. Typically, the protection buyer receives a floating rate of interest and protection against any reduction in fair value of the reference obligation, and the protection seller receives the cash flows associated with the reference obligation, plus any increase in the fair value of the reference obligation.

The firm economically hedges its exposure to written credit derivatives primarily by entering into offsetting purchased credit derivatives with identical underliers. Substantially all of the firm's purchased credit derivative transactions are with financial institutions and are subject to stringent collateral thresholds. In addition, upon the occurrence of a specified trigger event, the firm may take possession of the reference obligations underlying a particular written credit derivative, and consequently may, upon liquidation of the reference obligations, recover amounts on the underlying reference obligations in the event of default.

As of December 2018, written credit derivatives had a total gross notional amount of $554.17 billion and purchased credit derivatives had a total gross notional amount of $603.00 billion, for total net notional purchased protection of $48.83 billion. As of December 2017, written credit derivatives had a total gross notional amount of $611.04 billion and purchased credit derivatives had a total gross notional amount of $643.37 billion, for total net notional purchased protection of $32.33 billion. Substantially all of the firm's written and purchased credit derivatives are credit default swaps.

The table below presents information about credit derivatives.

| | Credit Spread on Underlier (basis points) | | | | |
|---|---|---|---|---|---|
| *$ in millions* | 0 - 250 | 251 - 500 | 501 - 1,000 | Greater than 1,000 | Total |
| **As of December 2018** | | | | | |
| **Maximum Payout/Notional Amount of Written Credit Derivatives by Tenor** | | | | | |
| Less than 1 year | **$145,828** | **$ 9,763** | **$ 1,151** | **$ 3,848** | **$160,590** |
| 1 – 5 years | **298,228** | **21,100** | **13,835** | **7,520** | **340,683** |
| Greater than 5 years | **45,690** | **5,966** | **1,121** | **122** | **52,899** |
| **Total** | **$489,746** | **$36,829** | **$16,107** | **$11,490** | **$554,172** |
| **Maximum Payout/Notional Amount of Purchased Credit Derivatives** | | | | | |
| Offsetting | **$413,445** | **$25,373** | **$14,243** | **$ 8,841** | **$461,902** |
| Other | **115,754** | **14,273** | **7,555** | **3,513** | **141,095** |
| **Fair Value of Written Credit Derivatives** | | | | | |
| Asset | **$ 8,656** | **$ 543** | **$ 95** | **$ 80** | **$ 9,374** |
| Liability | **1,990** | **1,415** | **1,199** | **3,368** | **7,972** |
| **Net asset/(liability)** | **$ 6,666** | **$ (872)** | **$ (1,104)** | **$ (3,288)** | **$ 1,402** |
| As of December 2017 | | | | | |
| **Maximum Payout/Notional Amount of Written Credit Derivatives by Tenor** | | | | | |
| Less than 1 year | $182,446 | $ 8,531 | $ 705 | $ 4,067 | $195,749 |
| 1 – 5 years | 335,872 | 10,201 | 8,747 | 7,553 | 362,373 |
| Greater than 5 years | 49,440 | 2,142 | 817 | 519 | 52,918 |
| Total | $567,758 | $20,874 | $10,269 | $12,139 | $611,040 |
| **Maximum Payout/Notional Amount of Purchased Credit Derivatives** | | | | | |
| Offsetting | $492,325 | $13,424 | $ 9,395 | $10,663 | $525,807 |
| Other | 99,861 | 14,483 | 1,777 | 1,442 | 117,563 |
| **Fair Value of Written Credit Derivatives** | | | | | |
| Asset | $ 14,317 | $ 513 | $ 208 | $ 155 | $ 15,193 |
| Liability | 896 | 402 | 752 | 3,920 | 5,970 |
| Net asset/(liability) | $ 13,421 | $ 111 | $ (544) | $ (3,765) | $ 9,223 |

In the table above:

- Fair values exclude the effects of both netting of receivable balances with payable balances under enforceable netting agreements, and netting of cash received or posted under enforceable credit support agreements, and therefore are not representative of the firm's credit exposure.
- Tenor is based on remaining contractual maturity.
- The credit spread on the underlier, together with the tenor of the contract, are indicators of payment/performance risk. The firm is less likely to pay or otherwise be required to perform where the credit spread and the tenor are lower.
- Offsetting purchased credit derivatives represent the notional amount of purchased credit derivatives that economically hedge written credit derivatives with identical underliers.
- Other purchased credit derivatives represent the notional amount of all other purchased credit derivatives not included in offsetting.

### Impact of Credit Spreads on Derivatives

On an ongoing basis, the firm realizes gains or losses relating to changes in credit risk through the unwind of derivative contracts and changes in credit mitigants.

The net gains/(losses), including hedges, attributable to the impact of changes in credit exposure and credit spreads (counterparty and the firm's) on derivatives was $371 million for 2018, $66 million for 2017 and $85 million for 2016.

### Bifurcated Embedded Derivatives

The table below presents the fair value and the notional amount of derivatives that have been bifurcated from their related borrowings.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Fair value of assets | **$ 980** | $ 882 |
| Fair value of liabilities | **1,297** | 1,200 |
| **Net liability** | **$ 317** | $ 318 |
| **Notional amount** | **$10,229** | $9,578 |

In the table above, these derivatives, which are recorded at fair value, primarily consist of interest rate, equity and commodity products and are included in unsecured short-term borrowings and unsecured long-term borrowings with the related borrowings. See Note 8 for further information.

### Derivatives with Credit-Related Contingent Features

Certain of the firm's derivatives have been transacted under bilateral agreements with counterparties who may require the firm to post collateral or terminate the transactions based on changes in the firm's credit ratings. The firm assesses the impact of these bilateral agreements by determining the collateral or termination payments that would occur assuming a downgrade by all rating agencies. A downgrade by any one rating agency, depending on the agency's relative ratings of the firm at the time of the downgrade, may have an impact which is comparable to the impact of a downgrade by all rating agencies.

The table below presents information about net derivative liabilities under such bilateral agreements (excluding application of collateral posted), the related fair value of collateral posted and the additional collateral or termination payments that could have been called by counterparties in the event of a one-notch and two-notch downgrade in the firm's credit ratings.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Net derivative liabilities under bilateral agreements | **$29,583** | $29,877 |
| Collateral posted | **$24,393** | $25,329 |
| Additional collateral or termination payments: | | |
| One-notch downgrade | **$ 262** | $ 358 |
| Two-notch downgrade | **$ 959** | $ 1,856 |

### Hedge Accounting

The firm applies hedge accounting for (i) certain interest rate swaps used to manage the interest rate exposure of certain fixed-rate unsecured long-term and short-term borrowings and certain fixed-rate certificates of deposit and (ii) certain foreign currency forward contracts and foreign currency-denominated debt used to manage foreign currency exposures on the firm's net investment in certain non-U.S. operations.

To qualify for hedge accounting, the hedging instrument must be highly effective at reducing the risk from the exposure being hedged. Additionally, the firm must formally document the hedging relationship at inception and assess the hedging relationship at least on a quarterly basis to ensure the hedging instrument continues to be highly effective over the life of the hedging relationship.

### Fair Value Hedges

The firm designates certain interest rate swaps as fair value hedges of certain fixed-rate unsecured long-term and short-term debt and fixed-rate certificates of deposit. These interest rate swaps hedge changes in fair value attributable to the designated benchmark interest rate (e.g., London Interbank Offered Rate (LIBOR) or Overnight Index Swap Rate), effectively converting a substantial portion of fixed-rate obligations into floating-rate obligations.

The firm applies a statistical method that utilizes regression analysis when assessing the effectiveness of its fair value hedging relationships in achieving offsetting changes in the fair values of the hedging instrument and the risk being hedged (i.e., interest rate risk). An interest rate swap is considered highly effective in offsetting changes in fair value attributable to changes in the hedged risk when the regression analysis results in a coefficient of determination of 80% or greater and a slope between 80% and 125%.

For qualifying fair value hedges, gains or losses on derivatives are included in interest expense. The change in fair value of the hedged item attributable to the risk being hedged is reported as an adjustment to its carrying value (hedging adjustment) and is also included in interest expense. When a derivative is no longer designated as a hedge, any remaining difference between the carrying value and par value of the hedged item is amortized to interest expense over the remaining life of the hedged item using the effective interest method. See Note 23 for further information about interest income and interest expense.

The table below presents the gains/(losses) from interest rate derivatives accounted for as hedges and the related hedged borrowings and deposits, and total interest expense.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Interest rate hedges | **$ (1,854)** | $ (2,867) | $(1,480) |
| Hedged borrowings and deposits | **$ 1,295** | $ 2,183 | $ 834 |
| Interest expense | **$15,912** | $10,181 | $ 7,104 |

In the table above:

- The difference between gains/(losses) from interest rate hedges and hedged borrowings and deposits was primarily due to the amortization of prepaid credit spreads resulting from the passage of time.
- Hedge ineffectiveness was $(684) million for 2017 and $(646) million for 2016.

The table below presents the carrying value of the hedged items that are currently designated in a hedging relationship and the related cumulative hedging adjustment (increase/(decrease)) from current and prior hedging relationships included in such carrying values.

| | **As of December 2018** | |
|---|---|---|
| *$ in millions* | **Carrying Value** | **Cumulative Hedging Adjustment** |
| Deposits | **$11,924** | **$ (156)** |
| Unsecured short-term borrowings | **$ 4,450** | **$ (12)** |
| Unsecured long-term borrowings | **$68,839** | **$2,759** |

In the table above, cumulative hedging adjustment included $1.74 billion of hedging adjustments from prior hedging relationships that were de-designated and substantially all were related to unsecured long-term borrowings.

In addition, as of December 2018, cumulative hedging adjustments for items no longer designated in a hedging relationship were $1.51 billion and substantially all were related to unsecured long-term borrowings.

### Net Investment Hedges

The firm seeks to reduce the impact of fluctuations in foreign exchange rates on its net investments in certain non-U.S. operations through the use of foreign currency forward contracts and foreign currency-denominated debt. For foreign currency forward contracts designated as hedges, the effectiveness of the hedge is assessed based on the overall changes in the fair value of the forward contracts (i.e., based on changes in forward rates). For foreign currency-denominated debt designated as a hedge, the effectiveness of the hedge is assessed based on changes in spot rates.

Beginning in January 2018, in accordance with ASU No. 2017-12 for qualifying net investment hedges, all gains or losses on the hedging instruments are included in currency translation. Prior to January 2018, gains or losses on the hedging instruments, only to the extent effective, were included in currency translation.

The table below presents the gains/(losses) from net investment hedging.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Hedges: | | | |
| Foreign currency forward contract | **$577** | $(805) | $135 |
| Foreign currency-denominated debt | **$ (50)** | $ (67) | $ (85) |

Gains or losses on individual net investments in non-U.S. operations are reclassified to earnings from accumulated other comprehensive income when such net investments are sold or substantially liquidated. The gross and net gains and losses on hedges and the related net investments in non-U.S. operations reclassified to earnings from accumulated other comprehensive income were not material for 2018. The net gain reclassified to earnings from accumulated other comprehensive income was $41 million (reflecting a gain of $205 million related to hedges and a loss of $164 million on the related net investments in non-U.S. operations) for 2017 and $28 million (reflecting a gain of $167 million related to hedges and a loss of $139 million on the related net investments in non-U.S. operations) for 2016. The gain/(loss) related to ineffectiveness was not material for 2017 or 2016.

The firm had designated $1.99 billion as of December 2018 and $1.81 billion as of December 2017 of foreign currency-denominated debt, included in unsecured long-term borrowings and unsecured short-term borrowings, as hedges of net investments in non-U.S. subsidiaries.

Note 8.

## Fair Value Option

### Other Financial Assets and Financial Liabilities at Fair Value

In addition to cash and derivative instruments included in financial instruments owned and financial instruments sold, but not yet purchased, the firm accounts for certain of its other financial assets and financial liabilities at fair value, substantially all under the fair value option. The primary reasons for electing the fair value option are to:

- Reflect economic events in earnings on a timely basis;
- Mitigate volatility in earnings from using different measurement attributes (e.g., transfers of financial instruments owned accounted for as financings are recorded at fair value, whereas the related secured financing would be recorded on an accrual basis absent electing the fair value option); and
- Address simplification and cost-benefit considerations (e.g., accounting for hybrid financial instruments at fair value in their entirety versus bifurcation of embedded derivatives and hedge accounting for debt hosts).

Hybrid financial instruments are instruments that contain bifurcatable embedded derivatives and do not require settlement by physical delivery of nonfinancial assets (e.g., physical commodities). If the firm elects to bifurcate the embedded derivative from the associated debt, the derivative is accounted for at fair value and the host contract is accounted for at amortized cost, adjusted for the effective portion of any fair value hedges. If the firm does not elect to bifurcate, the entire hybrid financial instrument is accounted for at fair value under the fair value option.

Other financial assets and financial liabilities accounted for at fair value under the fair value option include:

- Repurchase agreements and substantially all resale agreements;
- Securities borrowed and loaned in Fixed Income, Currency and Commodities Client Execution (FICC Client Execution);
- Substantially all other secured financings, including transfers of assets accounted for as financings;
- Certain unsecured short-term and long-term borrowings, substantially all of which are hybrid financial instruments;
- Certain customer and other receivables, including transfers of assets accounted for as secured loans and certain margin loans; and
- Certain time deposits (deposits with no stated maturity are not eligible for a fair value option election), including structured certificates of deposit, which are hybrid financial instruments.

**Fair Value of Other Financial Assets and Financial Liabilities by Level**

The table below presents, by level within the fair value hierarchy, other financial assets and financial liabilities at fair value, substantially all of which are accounted for at fair value under the fair value option.

| *$ in millions* | Level 1 | Level 2 | Level 3 | Total |
|---|---|---|---|---|
| **As of December 2018** | | | | |
| **Assets** | | | | |
| Resale agreements | **$ –** | **$ 139,220** | **$ –** | **$ 139,220** |
| Securities borrowed | **–** | **23,142** | **–** | **23,142** |
| Customer and other receivables | **–** | **3,183** | **6** | **3,189** |
| **Total** | **$ –** | **$ 165,545** | **$ 6** | **$ 165,551** |
| **Liabilities** | | | | |
| Deposits | **$ –** | **$ (17,892)** | **$ (3,168)** | **$ (21,060)** |
| Repurchase agreements | **–** | **(78,694)** | **(29)** | **(78,723)** |
| Securities loaned | **–** | **(3,241)** | **–** | **(3,241)** |
| Other secured financings | **–** | **(20,734)** | **(170)** | **(20,904)** |
| Unsecured borrowings: | | | | |
| Short-term | **–** | **(12,887)** | **(4,076)** | **(16,963)** |
| Long-term | **–** | **(34,761)** | **(11,823)** | **(46,584)** |
| Other liabilities | **–** | **(1)** | **(131)** | **(132)** |
| **Total** | **$ –** | **$(168,210)** | **$(19,397)** | **$(187,607)** |
| As of December 2017 | | | | |
| **Assets** | | | | |
| Resale agreements | $ – | $ 120,420 | $ – | $ 120,420 |
| Securities borrowed | – | 78,189 | – | 78,189 |
| Customer and other receivables | – | 3,522 | 4 | 3,526 |
| Total | $ – | $ 202,131 | $ 4 | $ 202,135 |
| **Liabilities** | | | | |
| Deposits | $ – | $ (19,934) | $ (2,968) | $ (22,902) |
| Repurchase agreements | – | (84,681) | (37) | (84,718) |
| Securities loaned | – | (5,357) | – | (5,357) |
| Other secured financings | – | (23,956) | (389) | (24,345) |
| Unsecured borrowings: | | | | |
| Short-term | – | (12,310) | (4,594) | (16,904) |
| Long-term | – | (31,204) | (7,434) | (38,638) |
| Other liabilities | – | (228) | (40) | (268) |
| Total | $ – | $(177,670) | $(15,462) | $(193,132) |

In the table above, other financial assets are shown as positive amounts and other financial liabilities are shown as negative amounts.

**Valuation Techniques and Significant Inputs**

Other financial assets and financial liabilities at fair value are generally valued based on discounted cash flow techniques, which incorporate inputs with reasonable levels of price transparency, and are generally classified in level 2 because the inputs are observable. Valuation adjustments may be made for liquidity and for counterparty and the firm's credit quality.

See below for information about the significant inputs used to value other financial assets and financial liabilities at fair value, including the ranges of significant unobservable inputs used to value the level 3 instruments within these categories. These ranges represent the significant unobservable inputs that were used in the valuation of each type of other financial assets and financial liabilities at fair value. The ranges and weighted averages of these inputs are not representative of the appropriate inputs to use when calculating the fair value of any one instrument. For example, the highest yield presented below for other secured financings is appropriate for valuing a specific agreement in that category but may not be appropriate for valuing any other agreements in that category. Accordingly, the ranges of inputs presented below do not represent uncertainty in, or possible ranges of, fair value measurements of the firm's level 3 other financial assets and financial liabilities.

**Resale and Repurchase Agreements and Securities Borrowed and Loaned.** The significant inputs to the valuation of resale and repurchase agreements and securities borrowed and loaned are funding spreads, the amount and timing of expected future cash flows and interest rates. As of both December 2018 and December 2017, the firm had no level 3 resale agreements, securities borrowed or securities loaned. As of both December 2018 and December 2017, the firm's level 3 repurchase agreements were not material. See Note 10 for further information about collateralized agreements and financings.

**Other Secured Financings.** The significant inputs to the valuation of other secured financings at fair value are the amount and timing of expected future cash flows, interest rates, funding spreads, the fair value of the collateral delivered by the firm (which is determined using the amount and timing of expected future cash flows, market prices, market yields and recovery assumptions) and the frequency of additional collateral calls. As of December 2018, the firm's level 3 other secured financings were not material. The ranges of significant unobservable inputs used to value level 3 other secured financings as of December 2017 are as follows:

- Yield: 0.6% to 13.0% (weighted average: 3.3%)
- Duration: 0.7 to 11.0 years (weighted average: 2.7 years)

Generally, increases in yield or duration, in isolation, would have resulted in a lower fair value measurement as of December 2017. Due to the distinctive nature of each of the firm's level 3 other secured financings, the interrelationship of inputs is not necessarily uniform across such financings. See Note 10 for further information about collateralized agreements and financings.

**Unsecured Short-term and Long-term Borrowings.** The significant inputs to the valuation of unsecured short-term and long-term borrowings at fair value are the amount and timing of expected future cash flows, interest rates, the credit spreads of the firm, as well as commodity prices in the case of prepaid commodity transactions. The inputs used to value the embedded derivative component of hybrid financial instruments are consistent with the inputs used to value the firm's other derivative instruments. See Note 7 for further information about derivatives, Note 15 for further information about unsecured short-term borrowings, and Note 16 for further information about long-term borrowings.

Certain of the firm's unsecured short-term and long-term borrowings are classified in level 3, substantially all of which are hybrid financial instruments. As the significant unobservable inputs used to value hybrid financial instruments primarily relate to the embedded derivative component of these borrowings, these inputs are incorporated in the firm's derivative disclosures related to unobservable inputs in Note 7.

**Customer and Other Receivables.** Customer and other receivables at fair value primarily consist of prepaid commodity transactions and transfers of assets accounted for as secured loans rather than purchases. The significant inputs to the valuation of such receivables are commodity prices, interest rates, the amount and timing of expected future cash flows and funding spreads. As of both December 2018 and December 2017, the firm's level 3 customer and other receivables were not material.

**Deposits.** The significant inputs to the valuation of time deposits are interest rates and the amount and timing of future cash flows. The inputs used to value the embedded derivative component of hybrid financial instruments are consistent with the inputs used to value the firm's other derivative instruments. See Note 7 for further information about derivatives and Note 14 for further information about deposits.

The firm's deposits that are classified in level 3 are hybrid financial instruments. As the significant unobservable inputs used to value hybrid financial instruments primarily relate to the embedded derivative component of these deposits, these inputs are incorporated in the firm's derivative disclosures related to unobservable inputs in Note 7.

## Level 3 Rollforward

The table below presents a summary of the changes in fair value for level 3 other financial assets and financial liabilities accounted for at fair value.

| | Year Ended December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Total other financial assets** | | |
| Beginning balance | **$ 4** | $ 55 |
| Net unrealized gains/(losses) | **2** | – |
| Purchases | **–** | 1 |
| Settlements | **–** | (52) |
| **Ending balance** | **$ 6** | $ 4 |
| **Total other financial liabilities** | | |
| Beginning balance | **$(15,462)** | $(14,979) |
| Net realized gains/(losses) | **(491)** | (362) |
| Net unrealized gains/(losses) | **2,013** | (1,047) |
| Purchases | **–** | (3) |
| Sales | **–** | 1 |
| Issuances | **(11,935)** | (8,382) |
| Settlements | **7,010** | 6,859 |
| Transfers into level 3 | **(1,416)** | (611) |
| Transfers out of level 3 | **884** | 3,062 |
| **Ending balance** | **$(19,397)** | $(15,462) |

In the table above:

- Changes in fair value are presented for all other financial assets and financial liabilities that are classified in level 3 as of the end of the period.
- Net unrealized gains/(losses) relates to instruments that were still held at period-end.
- Transfers between levels of the fair value hierarchy are reported at the beginning of the reporting period in which they occur. If a financial asset or financial liability was transferred to level 3 during a reporting period, its entire gain or loss for the period is classified in level 3.
- For level 3 other financial assets, increases are shown as positive amounts, while decreases are shown as negative amounts. For level 3 other financial liabilities, increases are shown as negative amounts, while decreases are shown as positive amounts.
- Level 3 other financial assets and financial liabilities are frequently economically hedged with cash instruments and derivatives. Accordingly, gains or losses that are classified in level 3 can be partially offset by gains or losses attributable to level 1, 2 or 3 cash instruments or derivatives. As a result, gains or losses included in the level 3 rollforward below do not necessarily represent the overall impact on the firm's results of operations, liquidity or capital resources.

The table below disaggregates, by the consolidated statements of financial condition line items, the information for other financial liabilities included in the summary table above.

| | Year Ended December | |
|---|---|---|
| $ in millions | **2018** | 2017 |
| **Deposits** | | |
| Beginning balance | **$ (2,968)** | $(3,173) |
| Net realized gains/(losses) | **(25)** | (6) |
| Net unrealized gains/(losses) | **272** | (239) |
| Issuances | **(796)** | (661) |
| Settlements | **298** | 232 |
| Transfers into level 3 | **(8)** | – |
| Transfers out of level 3 | **59** | 879 |
| **Ending balance** | **$ (3,168)** | $(2,968) |
| **Repurchase agreements** | | |
| Beginning balance | **$ (37)** | $ (66) |
| Net unrealized gains/(losses) | **2** | (1) |
| Settlements | **6** | 30 |
| **Ending balance** | **$ (29)** | $ (37) |
| **Other secured financings** | | |
| Beginning balance | **$ (389)** | $ (557) |
| Net realized gains/(losses) | **(15)** | 17 |
| Net unrealized gains/(losses) | **11** | (40) |
| Purchases | **–** | (3) |
| Sales | **–** | 1 |
| Issuances | **(8)** | (32) |
| Settlements | **157** | 171 |
| Transfers into level 3 | **(10)** | (12) |
| Transfers out of level 3 | **84** | 66 |
| **Ending balance** | **$ (170)** | $ (389) |
| **Unsecured short-term borrowings** | | |
| Beginning balance | **$ (4,594)** | $(3,896) |
| Net realized gains/(losses) | **(125)** | (332) |
| Net unrealized gains/(losses) | **558** | (230) |
| Issuances | **(4,564)** | (4,599) |
| Settlements | **4,481** | 3,675 |
| Transfers into level 3 | **(72)** | (131) |
| Transfers out of level 3 | **240** | 919 |
| **Ending balance** | **$ (4,076)** | $(4,594) |
| **Unsecured long-term borrowings** | | |
| Beginning balance | **$ (7,434)** | $(7,225) |
| Net realized gains/(losses) | **(349)** | (60) |
| Net unrealized gains/(losses) | **1,262** | (559) |
| Issuances | **(6,545)** | (3,071) |
| Settlements | **2,068** | 2,751 |
| Transfers into level 3 | **(1,326)** | (468) |
| Transfers out of level 3 | **501** | 1,198 |
| **Ending balance** | **$(11,823)** | $(7,434) |
| **Other liabilities** | | |
| Beginning balance | **$ (40)** | $ (62) |
| Net realized gains/(losses) | **23** | 19 |
| Net unrealized gains/(losses) | **(92)** | 22 |
| Issuances | **(22)** | (19) |
| **Ending balance** | **$ (131)** | $ (40) |

### Level 3 Rollforward Commentary

**Year Ended December 2018.** The net realized and unrealized gains on level 3 other financial liabilities of $1.52 billion (reflecting $491 million of net realized losses and $2.01 billion of net unrealized gains) for 2018 included gains/(losses) of $883 million reported in market making, $(1) million reported in other principal transactions and $(1) million reported in interest expense in the consolidated statements of earnings, and gains of $641 million reported in debt valuation adjustment in the consolidated statements of comprehensive income.

The net unrealized gains on level 3 other financial liabilities for 2018 primarily reflected gains on certain hybrid financial instruments included in unsecured long-term borrowings, principally due to the impact of wider credit spreads and increases in interest rates, and gains on certain hybrid financial instruments included in unsecured short-term borrowings, principally due to a decrease in global equity prices.

Transfers into level 3 other financial liabilities during 2018 primarily reflected transfers of certain hybrid financial instruments included in unsecured long-term borrowings from level 2, principally due to reduced transparency of certain inputs used to value these instruments as a result of a lack of market transactions in similar instruments.

Transfers out of level 3 other financial liabilities during 2018 primarily reflected transfers of certain hybrid financial instruments included in unsecured long-term and short-term borrowings to level 2, principally due to increased transparency of certain volatility and correlation inputs used to value these instruments.

**Year Ended December 2017.** The net realized and unrealized losses on level 3 other financial liabilities of $1.41 billion (reflecting $362 million of net realized losses and $1.05 billion of net unrealized losses) for 2017 included losses of $1.20 billion reported in market making, $45 million reported in other principal transactions and $10 million reported in interest expense in the consolidated statements of earnings, and losses of $149 million reported in debt valuation adjustment in the consolidated statements of comprehensive income.

The net unrealized losses on level 3 other financial liabilities for 2017 primarily reflected losses on certain hybrid financial instruments included in unsecured long-term and short-term borrowings, principally due to an increase in global equity prices and the impact of tighter credit spreads, and losses on certain hybrid financial instruments included in deposits, principally due to the impact of an increase in the market value of the underlying assets.

Transfers into level 3 other financial liabilities during 2017 primarily reflected transfers of certain hybrid financial instruments included in unsecured long-term borrowings from level 2, principally due to reduced transparency of volatility inputs used to value these instruments.

Transfers out of level 3 other financial liabilities during 2017 primarily reflected transfers of certain hybrid financial instruments included in unsecured long-term and short-term borrowings to level 2, principally due to increased transparency of certain inputs used to value these instruments as a result of market transactions in similar instruments, and transfers of certain hybrid financial instruments included in deposits to level 2, principally due to increased transparency of correlation and volatility inputs used to value these instruments.

### Gains and Losses on Financial Assets and Financial Liabilities Accounted for at Fair Value Under the Fair Value Option

The table below presents the gains and losses recognized in earnings as a result of the firm electing to apply the fair value option to certain financial assets and financial liabilities.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Unsecured short-term borrowings | **$1,443** | $(2,585) | $(1,028) |
| Unsecured long-term borrowings | **926** | (1,357) | 584 |
| Other liabilities | **(68)** | 222 | (55) |
| Other | **349** | (620) | (630) |
| **Total** | **$2,650** | $(4,340) | $(1,129) |

In the table above:

- Gains/(losses) are included in market making and other principal transactions.
- Gains/(losses) exclude contractual interest, which is included in interest income and interest expense, for all instruments other than hybrid financial instruments. See Note 23 for further information about interest income and interest expense.
- Gains/(losses) included in unsecured short-term and long-term borrowings were substantially all related to the embedded derivative component of hybrid financial instruments for 2018, 2017 and 2016. These gains and losses would have been recognized under other U.S. GAAP even if the firm had not elected to account for the entire hybrid financial instrument at fair value.
- Other primarily consists of gains/(losses) on customer and other receivables, deposits and other secured financings.

Excluding the gains and losses on the instruments accounted for at fair value under the fair value option described above, market making and other principal transactions primarily represent gains and losses on financial instruments owned and financial instruments sold, but not yet purchased.

### Loans and Lending Commitments

The table below presents the difference between the aggregate fair value and the aggregate contractual principal amount for loans and long-term receivables for which the fair value option was elected.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Performing loans and long-term receivables** | | |
| Aggregate contractual principal in excess of fair value | **$1,837** | $ 952 |
| **Loans on nonaccrual status and/or more than 90 days past due** | | |
| Aggregate contractual principal in excess of fair value | **$5,260** | $5,266 |
| Aggregate fair value of loans on nonaccrual status and/or more than 90 days past due | **$2,010** | $2,104 |

In the table above, the aggregate contractual principal amount of loans on nonaccrual status and/or more than 90 days past due (which excludes loans carried at zero fair value and considered uncollectible) exceeds the related fair value primarily because the firm regularly purchases loans, such as distressed loans, at values significantly below the contractual principal amounts.

The fair value of unfunded lending commitments for which the fair value option was elected was a liability of $45 million as of December 2018 and $31 million as of December 2017, and the related total contractual amount of these lending commitments was $7.72 billion as of December 2018 and $9.94 billion as of December 2017. See Note 18 for further information about lending commitments.

### Long-Term Debt Instruments

The difference between the aggregate contractual principal amount and the related fair value of long-term other secured financings for which the fair value option was elected was not material as of both December 2018 and December 2017. The aggregate contractual principal amount of unsecured long-term borrowings for which the fair value option was elected exceeded the related fair value by $2.38 billion as of December 2018 and $1.69 billion as of December 2017. The amounts above include both principal- and non-principal-protected long-term borrowings.

### Impact of Credit Spreads on Loans and Lending Commitments

The estimated net gain attributable to changes in instrument-specific credit spreads on loans and lending commitments for which the fair value option was elected was $211 million for 2018, $268 million for 2017 and $281 million for 2016. The firm generally calculates the fair value of loans and lending commitments for which the fair value option is elected by discounting future cash flows at a rate which incorporates the instrument-specific credit spreads. For floating-rate loans and lending commitments, substantially all changes in fair value are attributable to changes in instrument-specific credit spreads, whereas for fixed-rate loans and lending commitments, changes in fair value are also attributable to changes in interest rates.

### Debt Valuation Adjustment

The firm calculates the fair value of financial liabilities for which the fair value option is elected by discounting future cash flows at a rate which incorporates the firm's credit spreads.

The table below presents information about the net DVA gains/(losses) on financial liabilities for which the fair value option was elected.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| DVA (pre-tax) | **$3,389** | $(1,232) | $(844) |
| DVA (net of tax) | **$2,553** | $ (807) | $(544) |

In the table above:

- DVA (net of tax) is included in debt valuation adjustment in the consolidated statements of comprehensive income.
- The gains/(losses) reclassified to earnings from accumulated other comprehensive loss upon extinguishment of such financial liabilities were not material for 2018, 2017 and 2016.

**Note 9.**

## Loans Receivable

Loans receivable consists of loans held for investment that are accounted for at amortized cost net of allowance for loan losses. Interest on loans receivable is recognized over the life of the loan and is recorded on an accrual basis.

The table below presents information about loans receivable.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Corporate loans | **$37,283** | $30,749 |
| PWM loans | **17,219** | 16,591 |
| Commercial real estate loans | **11,441** | 7,987 |
| Residential real estate loans | **7,284** | 6,234 |
| Consumer loans | **4,536** | 1,912 |
| Other loans | **3,893** | 3,263 |
| Total loans receivable, gross | **81,656** | 66,736 |
| Allowance for loan losses | **(1,066)** | (803) |
| **Total loans receivable** | **$80,590** | $65,933 |

The fair value of loans receivable was $80.74 billion as of December 2018 and $66.29 billion as of December 2017. Had these loans been carried at fair value and included in the fair value hierarchy, $40.64 billion as of December 2018 and $38.75 billion as of December 2017 would have been classified in level 2, and $40.10 billion as of December 2018 and $27.54 billion as of December 2017 would have been classified in level 3.

The following is a description of the captions in the table above:

- **Corporate Loans.** Corporate loans includes term loans, revolving lines of credit, letter of credit facilities and bridge loans, and are principally used for operating liquidity and general corporate purposes, or in connection with acquisitions. Corporate loans may be secured or unsecured, depending on the loan purpose, the risk profile of the borrower and other factors. Loans receivable related to the firm's relationship lending activities are reported within corporate loans.
- **Private Wealth Management (PWM) Loans.** PWM loans includes loans extended by the private bank. These loans are used to finance investments in both financial and nonfinancial assets, bridge cash flow timing gaps or provide liquidity for other needs. Substantially all of such loans are secured by securities or other assets.
- **Commercial Real Estate Loans.** Commercial real estate loans includes loans extended by the firm that are directly or indirectly secured by hotels, retail stores, multifamily housing complexes and commercial and industrial properties. Commercial real estate loans also includes loans purchased by the firm.

- **Residential Real Estate Loans.** Residential real estate loans includes loans extended by the firm to clients who warehouse assets that are directly or indirectly secured by residential real estate. Residential real estate loans also includes loans purchased by the firm.
- **Consumer Loans.** Consumer loans represents unsecured consumer loans originated by the firm.
- **Other Loans.** Other loans primarily includes loans extended to clients who warehouse assets that are directly or indirectly secured by consumer loans, including auto loans and private student loans. Other loans also includes unsecured consumer loans purchased by the firm.

## Lending Commitments

The table below presents information about lending commitments that are held for investment and accounted for on an accrual basis.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Corporate | **$113,484** | $118,553 |
| Other | **7,513** | 5,951 |
| **Total** | **$120,997** | $124,504 |

In the table above:

- Corporate lending commitments primarily relates to the firm's relationship lending activities.
- Other lending commitments primarily relates to lending commitments extended to clients who warehouse assets backed by real estate and other assets and in connection with commercial real estate financing.
- The carrying value of lending commitments were liabilities of $443 million (including allowance for losses of $286 million) as of December 2018 and $423 million (including allowance for losses of $274 million) as of December 2017.
- The estimated fair value of such lending commitments were liabilities of $3.78 billion as of December 2018 and $2.27 billion as of December 2017. Had these lending commitments been carried at fair value and included in the fair value hierarchy, $1.12 billion as of December 2018 and $772 million as of December 2017 would have been classified in level 2, and $2.66 billion as of December 2018 and $1.50 billion as of December 2017 would have been classified in level 3.

## PCI Loans

Loans receivable includes PCI loans, which represent acquired loans or pools of loans with evidence of credit deterioration subsequent to their origination and where it is probable, at acquisition, that the firm will not be able to collect all contractually required payments. Loans acquired within the same reporting period, which have at least two common risk characteristics, one of which relates to their credit risk, are eligible to be pooled together and considered a single unit of account. PCI loans are initially recorded at the acquisition price and the difference between the acquisition price and the expected cash flows (accretable yield) is recognized as interest income over the life of such loans or pools of loans on an effective yield method. Expected cash flows on PCI loans are determined using various inputs and assumptions, including default rates, loss severities, recoveries, amount and timing of prepayments and other macroeconomic indicators.

The tables below present information about PCI loans.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Commercial real estate loans | **$ 581** | $1,116 |
| Residential real estate loans | **2,457** | 3,327 |
| Other loans | **4** | 10 |
| **Total gross carrying value** | **$3,042** | $4,453 |
| **Total outstanding principal balance** | **$5,576** | $9,512 |
| **Total accretable yield** | **$ 459** | $ 662 |

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Acquired during the period** | | | |
| Fair value | **$ 839** | $1,769 | $2,514 |
| Expected cash flows | **$ 937** | $1,961 | $2,818 |
| Contractually required cash flows | **$1,881** | $4,092 | $6,389 |

In the table above:

- Fair value, expected cash flows and contractually required cash flows were as of the acquisition date.
- Expected cash flows represents the cash flows expected to be received over the life of the loan or as a result of liquidation of the underlying collateral.
- Contractually required cash flows represents cash flows required to be repaid by the borrower over the life of the loan.

### Credit Quality

**Risk Assessment.** The firm's risk assessment process includes evaluating the credit quality of its loans receivable. For loans receivable (excluding PCI and consumer loans) and lending commitments, the firm performs credit reviews which include initial and ongoing analyses of its borrowers. A credit review is an independent analysis of the capacity and willingness of a borrower to meet its financial obligations, resulting in an internal credit rating. The determination of internal credit ratings also incorporates assumptions with respect to the nature of and outlook for the borrower's industry and the economic environment. The firm also assigns a regulatory risk rating to such loans based on the definitions provided by the U.S. federal bank regulatory agencies.

The firm enters into economic hedges to mitigate credit risk on certain loans receivable and corporate lending commitments (both of which are held for investment) related to the firm's relationship lending activities. Such hedges are accounted for at fair value. See Note 18 for further information about these lending commitments and associated hedges.

The table below presents gross loans receivable (excluding PCI and consumer loans of $7.58 billion as of December 2018 and $6.37 billion as of December 2017) and lending commitments by an internally determined public rating agency equivalent and by regulatory risk rating.

| *$ in millions* | Loans | Lending Commitments | Total |
|---|---|---|---|
| **Credit Rating Equivalent As of December 2018** | | | |
| Investment-grade | **$28,290** | **$ 81,959** | **$110,249** |
| Non-investment-grade | **45,788** | **39,038** | **84,826** |
| **Total** | **$74,078** | **$120,997** | **$195,075** |
| As of December 2017 | | | |
| Investment-grade | $24,192 | $ 89,409 | $113,601 |
| Non-investment-grade | 36,179 | 35,095 | 71,274 |
| Total | $60,371 | $124,504 | $184,875 |
| **Regulatory Risk Rating As of December 2018** | | | |
| Non-criticized/pass | **$70,153** | **$117,923** | **$188,076** |
| Criticized | **3,925** | **3,074** | **6,999** |
| **Total** | **$74,078** | **$120,997** | **$195,075** |
| As of December 2017 | | | |
| Non-criticized/pass | $56,720 | $119,427 | $176,147 |
| Criticized | 3,651 | 5,077 | 8,728 |
| Total | $60,371 | $124,504 | $184,875 |

In the table above, non-criticized/pass loans and lending commitments represent loans and lending commitments that are performing and/or do not demonstrate adverse characteristics that are likely to result in a credit loss.

For consumer loans, an important credit-quality indicator is the Fair Isaac Corporation (FICO) credit score, which measures a borrower's creditworthiness by considering factors such as payment and credit history. FICO credit scores are refreshed periodically by the firm to assess the updated creditworthiness of the borrower.

The table below presents gross consumer loans receivable and the concentration by refreshed FICO credit score.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Consumer loans, gross** | **$4,536** | $1,912 |
| **Refreshed FICO credit score** | | |
| Greater than or equal to 660 | **88%** | 89% |
| Less than 660 | **12%** | 11% |
| **Total** | **100%** | 100% |

For PCI loans, the firm's risk assessment process includes reviewing certain key metrics, such as delinquency status, collateral values, expected cash flows and other risk factors.

**Impaired Loans.** Loans receivable (excluding PCI loans) are determined to be impaired when it is probable that the firm will not collect all principal and interest due under the contractual terms. At that time, loans are generally placed on nonaccrual status and all accrued but uncollected interest is reversed against interest income and interest subsequently collected is recognized on a cash basis to the extent the loan balance is deemed collectible. Otherwise, all cash received is used to reduce the outstanding loan balance. A loan is considered past due when a principal or interest payment has not been made according to its contractual terms.

In certain circumstances, the firm may also modify the original terms of a loan agreement by granting a concession to a borrower experiencing financial difficulty. Such modifications are considered troubled debt restructurings and typically include interest rate reductions, payment extensions, and modification of loan covenants. Loans modified in a troubled debt restructuring are considered impaired and are subject to specific loan-level reserves.

The gross carrying value of impaired loans receivable (excluding PCI loans) on nonaccrual status was $838 million as of December 2018 and $845 million as of December 2017. Such loans included $27 million as of December 2018 and $61 million as of December 2017 of corporate loans that were modified in a troubled debt restructuring. The firm did not have any lending commitments related to these loans as of both December 2018 and December 2017. The amount of loans 30 days or more past due was $208 million as of December 2018 and $567 million as of December 2017.

When it is determined that the firm cannot reasonably estimate expected cash flows on PCI loans or pools of loans, such loans are placed on nonaccrual status.

### Allowance for Credit Losses

The firm's allowance for credit losses consists of the allowance for losses on loans and lending commitments.

The firm's allowance for loan losses consists of specific loan-level reserves, portfolio level reserves and reserves on PCI loans, as described below:

- Specific loan-level reserves are determined on loans (excluding PCI loans) that exhibit credit quality weakness and are therefore individually evaluated for impairment.
- Portfolio level reserves are determined on loans (excluding PCI loans) not evaluated for specific loan-level reserves by aggregating groups of loans with similar risk characteristics and estimating the probable loss inherent in the portfolio.
- Reserves on PCI loans are recorded when it is determined that the expected cash flows, which are reassessed on a quarterly basis, will be lower than those used to establish the current effective yield for such loans or pools of loans. If the expected cash flows are determined to be significantly higher than those used to establish the current effective yield, such increases are initially recognized as a reduction to any previously recorded allowances for loan losses and any remaining increases are recognized as interest income prospectively over the life of the loan or pools of loans as an increase to the effective yield.

The allowance for loan losses is determined using various risk factors, including industry default and loss data, current macroeconomic indicators, borrower's capacity to meet its financial obligations, borrower's country of risk, loan seniority and collateral type. In addition, for loans backed by real estate, risk factors include loan to value ratio, debt service ratio and home price index. Risk factors for consumer loans include FICO credit scores and delinquency status.

Management's estimate of loan losses entails judgment about loan collectability at the reporting dates, and there are uncertainties inherent in those judgments. While management uses the best information available to determine this estimate, future adjustments to the allowance may be necessary based on, among other things, changes in the economic environment or variances between actual results and the original assumptions used. Loans are charged off against the allowance for loan losses when deemed to be uncollectible.

The firm also records an allowance for losses on lending commitments that are held for investment and accounted for on an accrual basis. Such allowance is determined using the same methodology as the allowance for loan losses, while also taking into consideration the probability of drawdowns or funding, and is included in other liabilities.

The table below presents gross loans receivable and lending commitments by impairment methodology.

| *$ in millions* | Specific | Portfolio | PCI | Total |
|---|---|---|---|---|
| **As of December 2018** | | | | |
| **Loans Receivable** | | | | |
| Corporate loans | **$358** | **$ 36,925** | **$ –** | **$ 37,283** |
| PWM loans | **46** | **17,173** | **–** | **17,219** |
| Commercial real estate loans | **9** | **10,851** | **581** | **11,441** |
| Residential real estate loans | **425** | **4,402** | **2,457** | **7,284** |
| Consumer loans | **–** | **4,536** | **–** | **4,536** |
| Other loans | **–** | **3,889** | **4** | **3,893** |
| **Total** | **$838** | **$ 77,776** | **$3,042** | **$ 81,656** |
| **Lending Commitments** | | | | |
| Corporate | **$ 31** | **$113,453** | **$ –** | **$113,484** |
| Other | **–** | **7,513** | **–** | **7,513** |
| **Total** | **$ 31** | **$120,966** | **$ –** | **$120,997** |
| As of December 2017 | | | | |
| **Loans Receivable** | | | | |
| Corporate loans | $377 | $ 30,372 | $ – | $ 30,749 |
| PWM loans | 163 | 16,428 | – | 16,591 |
| Commercial real estate loans | – | 6,871 | 1,116 | 7,987 |
| Residential real estate loans | 231 | 2,676 | 3,327 | 6,234 |
| Consumer loans | – | 1,912 | – | 1,912 |
| Other loans | 74 | 3,179 | 10 | 3,263 |
| Total | $845 | $ 61,438 | $4,453 | $ 66,736 |
| **Lending Commitments** | | | | |
| Corporate | $ 53 | $118,500 | $ – | $118,553 |
| Other | – | 5,951 | – | 5,951 |
| Total | $ 53 | $124,451 | $ – | $124,504 |

In the table above:

- Gross loans receivable and lending commitments, subject to specific loan-level reserves, included $484 million as of December 2018 and $492 million as of December 2017 of impaired loans and lending commitments, which did not require a reserve as the loan was deemed to be recoverable.
- Gross loans receivable deemed impaired and subject to specific loan-level reserves as a percentage of total gross loans receivable was 1.0% as of December 2018 and 1.3% as of December 2017.

The table below presents information about the allowance for credit losses.

| | Year Ended December 2018 | | Year Ended December 2017 | |
|---|---|---|---|---|
| *$ in millions* | **Loans Receivable** | **Lending Commitments** | Loans Receivable | Lending Commitments |
| **Changes in the allowance for credit losses** | | | | |
| Beginning balance | **$ 803** | **$274** | $ 509 | $212 |
| Net charge-offs | **(337)** | **–** | (203) | – |
| Provision | **654** | **20** | 574 | 83 |
| Other | **(54)** | **(8)** | (77) | (21) |
| **Ending balance** | **$1,066** | **$286** | $ 803 | $274 |
| **Allowance for losses by impairment methodology** | | | | |
| Specific | **$ 102** | **$ 3** | $ 119 | $ 14 |
| Portfolio | **848** | **283** | 518 | 260 |
| PCI | **116** | **–** | 166 | – |
| **Total** | **$1,066** | **$286** | $ 803 | $274 |

In the table above:

- Net charge-offs were primarily related to consumer loans and commercial real estate PCI loans for 2018 and primarily related to corporate loans for 2017.
- The provision for credit losses was primarily related to consumer loans and corporate loans for 2018 and primarily related to corporate loans and lending commitments, and commercial real estate loans for 2017.
- Other represents the reduction to the allowance related to loans and lending commitments transferred to held for sale.
- Portfolio level reserves were primarily related to corporate loans and lending commitments, specific loan-level reserves were substantially all related to corporate loans and reserves on PCI loans were related to real estate loans.
- Substantially all of the allowance for losses on lending commitments was related to corporate lending commitments.
- Allowance for loan losses as a percentage of total gross loans receivable was 1.3% as of December 2018 and 1.2% as of December 2017.
- Net charge-offs as a percentage of average total gross loans receivable were 0.5% for 2018 and 0.4% for 2017.

### Note 10.

## Collateralized Agreements and Financings

Collateralized agreements are resale agreements and securities borrowed. Collateralized financings are repurchase agreements, securities loaned and other secured financings. The firm enters into these transactions in order to, among other things, facilitate client activities, invest excess cash, acquire securities to cover short positions and finance certain firm activities.

Collateralized agreements and financings are presented on a net-by-counterparty basis when a legal right of setoff exists. Interest on collateralized agreements, which is included in interest income, and collateralized financings, which is included in interest expense, is recognized over the life of the transaction. See Note 23 for further information about interest income and interest expense.

The table below presents the carrying value of resale and repurchase agreements and securities borrowed and loaned transactions.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Resale agreements | **$139,258** | $120,822 |
| Securities borrowed | **$135,285** | $190,848 |
| Repurchase agreements | **$ 78,723** | $ 84,718 |
| Securities loaned | **$ 11,808** | $ 14,793 |

In the table above:

- Substantially all resale agreements and all repurchase agreements are carried at fair value under the fair value option. See Note 8 for further information about the valuation techniques and significant inputs used to determine fair value.
- Securities borrowed of $23.14 billion as of December 2018 and $78.19 billion as of December 2017, and securities loaned of $3.24 billion as of December 2018 and $5.36 billion as of December 2017 were at fair value.

### Resale and Repurchase Agreements

A resale agreement is a transaction in which the firm purchases financial instruments from a seller, typically in exchange for cash, and simultaneously enters into an agreement to resell the same or substantially the same financial instruments to the seller at a stated price plus accrued interest at a future date.

A repurchase agreement is a transaction in which the firm sells financial instruments to a buyer, typically in exchange for cash, and simultaneously enters into an agreement to repurchase the same or substantially the same financial instruments from the buyer at a stated price plus accrued interest at a future date.

Even though repurchase and resale agreements (including "repos- and reverses-to-maturity") involve the legal transfer of ownership of financial instruments, they are accounted for as financing arrangements because they require the financial instruments to be repurchased or resold before or at the maturity of the agreement. The financial instruments purchased or sold in resale and repurchase agreements typically include U.S. government and agency, and investment-grade sovereign obligations.

The firm receives financial instruments purchased under resale agreements and makes delivery of financial instruments sold under repurchase agreements. To mitigate credit exposure, the firm monitors the market value of these financial instruments on a daily basis, and delivers or obtains additional collateral due to changes in the market value of the financial instruments, as appropriate. For resale agreements, the firm typically requires collateral with a fair value approximately equal to the carrying value of the relevant assets in the consolidated statements of financial condition.

### Securities Borrowed and Loaned Transactions

In a securities borrowed transaction, the firm borrows securities from a counterparty in exchange for cash or securities. When the firm returns the securities, the counterparty returns the cash or securities. Interest is generally paid periodically over the life of the transaction.

In a securities loaned transaction, the firm lends securities to a counterparty in exchange for cash or securities. When the counterparty returns the securities, the firm returns the cash or securities posted as collateral. Interest is generally paid periodically over the life of the transaction.

The firm receives securities borrowed and makes delivery of securities loaned. To mitigate credit exposure, the firm monitors the market value of these securities on a daily basis, and delivers or obtains additional collateral due to changes in the market value of the securities, as appropriate. For securities borrowed transactions, the firm typically requires collateral with a fair value approximately equal to the carrying value of the securities borrowed transaction.

Securities borrowed and loaned within FICC Client Execution are recorded at fair value under the fair value option. See Note 8 for further information about securities borrowed and loaned accounted for at fair value.

Securities borrowed and loaned within Securities Services are recorded based on the amount of cash collateral advanced or received plus accrued interest. As these agreements generally can be terminated on demand, they exhibit little, if any, sensitivity to changes in interest rates. Therefore, the carrying value of such agreements approximates fair value. As these agreements are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these agreements been included in the firm's fair value hierarchy, they would have been classified in level 2 as of both December 2018 and December 2017.

### Offsetting Arrangements

The table below presents the gross and net resale and repurchase agreements and securities borrowed and loaned transactions, and the related amount of counterparty netting included in the consolidated statements of financial condition, as well as the amounts of counterparty netting and cash and securities collateral not offset in the consolidated statements of financial condition.

| | Assets | | Liabilities | |
|---|---|---|---|---|
| *$ in millions* | Resale agreements | Securities borrowed | Repurchase agreements | Securities loaned |
| **As of December 2018** | | | | |
| **Included in consolidated statements of financial condition** | | | | |
| Gross carrying value | **$ 246,284** | **$ 139,556** | **$ 185,749** | **$ 16,079** |
| Counterparty netting | **(107,026)** | **(4,271)** | **(107,026)** | **(4,271)** |
| **Total** | **139,258** | **135,285** | **78,723** | **11,808** |
| **Amounts not offset** | | | | |
| Counterparty netting | **(5,870)** | **(1,104)** | **(5,870)** | **(1,104)** |
| Collateral | **(130,707)** | **(127,340)** | **(70,691)** | **(10,491)** |
| **Total** | **$ 2,681** | **$ 6,841** | **$ 2,162** | **$ 213** |
| As of December 2017 | | | | |
| **Included in consolidated statements of financial condition** | | | | |
| Gross carrying value | $ 209,972 | $ 195,783 | $ 173,868 | $ 19,728 |
| Counterparty netting | (89,150) | (4,935) | (89,150) | (4,935) |
| Total | 120,822 | 190,848 | 84,718 | 14,793 |
| **Amounts not offset** | | | | |
| Counterparty netting | (5,441) | (4,412) | (5,441) | (4,412) |
| Collateral | (113,305) | (177,679) | (76,793) | (9,731) |
| Total | $ 2,076 | $ 8,757 | $ 2,484 | $ 650 |

In the table above:

- Substantially all of the gross carrying values of these arrangements are subject to enforceable netting agreements.
- Where the firm has received or posted collateral under credit support agreements, but has not yet determined such agreements are enforceable, the related collateral has not been netted.
- Amounts not offset includes counterparty netting that does not meet the criteria for netting under U.S. GAAP and the fair value of collateral received or posted subject to enforceable credit support agreements.

### Gross Carrying Value of Repurchase Agreements and Securities Loaned

The table below presents the gross carrying value of repurchase agreements and securities loaned by class of collateral pledged.

| $ in millions | Repurchase agreements | Securities loaned |
|---|---|---|
| **As of December 2018** | | |
| Money market instruments | **$ 100** | **$ –** |
| U.S. government and agency obligations | **88,060** | **–** |
| Non-U.S. government and agency obligations | **84,443** | **2,438** |
| Securities backed by commercial real estate | **3** | **–** |
| Securities backed by residential real estate | **221** | **–** |
| Corporate debt securities | **5,495** | **195** |
| State and municipal obligations | **25** | **–** |
| Equity securities | **7,402** | **13,446** |
| **Total** | **$185,749** | **$16,079** |
| As of December 2017 | | |
| Money market instruments | $ 97 | $ – |
| U.S. government and agency obligations | 80,591 | – |
| Non-U.S. government and agency obligations | 73,031 | 2,245 |
| Securities backed by commercial real estate | 43 | – |
| Securities backed by residential real estate | 338 | – |
| Corporate debt securities | 7,140 | 1,145 |
| Other debt obligations | 55 | – |
| Equity securities | 12,573 | 16,338 |
| Total | $173,868 | $19,728 |

The table below presents the gross carrying value of repurchase agreements and securities loaned by maturity date.

| | As of December 2018 | |
|---|---|---|
| $ in millions | **Repurchase agreements** | **Securities loaned** |
| No stated maturity and overnight | **$ 65,764** | **$ 8,300** |
| 2 - 30 days | **82,482** | **4,273** |
| 31 - 90 days | **14,636** | **774** |
| 91 days - 1 year | **17,137** | **2,503** |
| Greater than 1 year | **5,730** | **229** |
| **Total** | **$185,749** | **$16,079** |

In the table above:

- Repurchase agreements and securities loaned that are repayable prior to maturity at the option of the firm are reflected at their contractual maturity dates.
- Repurchase agreements and securities loaned that are redeemable prior to maturity at the option of the holder are reflected at the earliest dates such options become exercisable.

### Other Secured Financings

In addition to repurchase agreements and securities loaned transactions, the firm funds certain assets through the use of other secured financings and pledges financial instruments and other assets as collateral in these transactions. These other secured financings consist of:

- Liabilities of consolidated VIEs;
- Transfers of assets accounted for as financings rather than sales (e.g., collateralized central bank financings, pledged commodities, bank loans and mortgage whole loans); and
- Other structured financing arrangements.

Other secured financings includes nonrecourse arrangements. Nonrecourse other secured financings were $8.47 billion as of December 2018 and $5.31 billion as of December 2017.

The firm has elected to apply the fair value option to substantially all other secured financings because the use of fair value eliminates non-economic volatility in earnings that would arise from using different measurement attributes. See Note 8 for further information about other secured financings that are accounted for at fair value.

Other secured financings that are not recorded at fair value are recorded based on the amount of cash received plus accrued interest, which generally approximates fair value. As these financings are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these financings been included in the firm's fair value hierarchy, they would have been primarily classified in level 2 as of both December 2018 and December 2017.

The table below presents information about other secured financings.

| $ in millions | U.S. Dollar | Non-U.S. Dollar | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| Other secured financings (short-term): | | | |
| At fair value | **$ 3,528** | **$ 6,027** | **$ 9,555** |
| At amortized cost | **–** | **–** | **–** |
| Other secured financings (long-term): | | | |
| At fair value | **9,010** | **2,339** | **11,349** |
| At amortized cost | **529** | **–** | **529** |
| **Total other secured financings** | **$13,067** | **$ 8,366** | **$21,433** |
| **Other secured financings collateralized by:** | | | |
| Financial instruments | **$ 8,960** | **$ 7,550** | **$16,510** |
| Other assets | **$ 4,107** | **$ 816** | **$ 4,923** |
| As of December 2017 | | | |
| Other secured financings (short-term): | | | |
| At fair value | $ 7,704 | $ 6,856 | $14,560 |
| At amortized cost | – | 336 | 336 |
| Other secured financings (long-term): | | | |
| At fair value | 6,779 | 3,006 | 9,785 |
| At amortized cost | 107 | – | 107 |
| Total other secured financings | $14,590 | $10,198 | $24,788 |
| Other secured financings collateralized by: | | | |
| Financial instruments | $12,454 | $ 9,870 | $22,324 |
| Other assets | $ 2,136 | $ 328 | $ 2,464 |

In the table above:

- Short-term other secured financings includes financings maturing within one year of the financial statement date and financings that are redeemable within one year of the financial statement date at the option of the holder.
- U.S. dollar-denominated long-term other secured financings at amortized cost had a weighted average interest rate of 4.02% as of December 2018 and 3.89% as of December 2017. These rates include the effect of hedging activities.
- Non-U.S. dollar-denominated short-term other secured financings at amortized cost had a weighted average interest rate of 2.61% as of December 2017. This rate includes the effect of hedging activities.
- Total other secured financings included $2.40 billion as of December 2018 and $1.55 billion as of December 2017 related to transfers of financial assets accounted for as financings rather than sales. Such financings were collateralized by financial assets of $2.41 billion as of December 2018 and $1.57 billion as of December 2017, both primarily included in financial instruments owned.
- Other secured financings collateralized by financial instruments included $12.41 billion as of December 2018 and $16.61 billion as of December 2017 of other secured financings collateralized by financial instruments owned, and included $4.10 billion as of December 2018 and $5.71 billion as of December 2017 of other secured financings collateralized by financial instruments received as collateral and repledged.

The table below presents other secured financings by maturity.

| $ in millions | As of December 2018 |
|---|---|
| Other secured financings (short-term) | **$ 9,555** |
| Other secured financings (long-term): | |
| 2020 | **4,435** |
| 2021 | **1,276** |
| 2022 | **2,387** |
| 2023 | **776** |
| 2024 - thereafter | **3,004** |
| Total other secured financings (long-term) | **11,878** |
| **Total other secured financings** | **$21,433** |

In the table above:

- Long-term other secured financings that are repayable prior to maturity at the option of the firm are reflected at their contractual maturity dates.
- Long-term other secured financings that are redeemable prior to maturity at the option of the holder are reflected at the earliest dates such options become exercisable.

### Collateral Received and Pledged

The firm receives cash and securities (e.g., U.S. government and agency obligations, other sovereign and corporate obligations, as well as equity securities) as collateral, primarily in connection with resale agreements, securities borrowed, derivative transactions and customer margin loans. The firm obtains cash and securities as collateral on an upfront or contingent basis for derivative instruments and collateralized agreements to reduce its credit exposure to individual counterparties.

In many cases, the firm is permitted to deliver or repledge financial instruments received as collateral when entering into repurchase agreements and securities loaned transactions, primarily in connection with secured client financing activities. The firm is also permitted to deliver or repledge these financial instruments in connection with other secured financings, collateralized derivative transactions and firm or customer settlement requirements.

The firm also pledges certain financial instruments owned in connection with repurchase agreements, securities loaned transactions and other secured financings, and other assets (substantially all real estate and cash) in connection with other secured financings to counterparties who may or may not have the right to deliver or repledge them.

The table below presents financial instruments at fair value received as collateral that were available to be delivered or repledged and were delivered or repledged.

| | As of December | |
|---|---|---|
| $ in millions | **2018** | 2017 |
| Collateral available to be delivered or repledged | **$681,516** | $763,984 |
| Collateral that was delivered or repledged | **$565,625** | $599,565 |

In the table above, collateral available to be delivered or repledged excludes $14.10 billion as of December 2018 and $1.52 billion as of December 2017 of securities received under resale agreements and securities borrowed transactions that contractually had the right to be delivered or repledged, but were segregated for regulatory and other purposes.

The table below presents information about assets pledged.

| | As of December | |
|---|---|---|
| $ in millions | **2018** | 2017 |
| Financial instruments owned pledged to counterparties that: | | |
| Had the right to deliver or repledge | **$ 55,081** | $ 50,335 |
| Did not have the right to deliver or repledge | **$ 73,540** | $ 78,656 |
| Other assets pledged to counterparties that did not have the right to deliver or repledge | **$ 8,037** | $ 4,838 |

The firm also segregated securities included in financial instruments owned of $23.03 billion as of December 2018 and $10.42 billion as of December 2017 for regulatory and other purposes. See Note 3 for information about segregated cash.

**Note 11.**

## Securitization Activities

The firm securitizes residential and commercial mortgages, corporate bonds, loans and other types of financial assets by selling these assets to securitization vehicles (e.g., trusts, corporate entities and limited liability companies) or through a resecuritization. The firm acts as underwriter of the beneficial interests that are sold to investors. The firm's residential mortgage securitizations are primarily in connection with government agency securitizations.

Beneficial interests issued by securitization entities are debt or equity instruments that give the investors rights to receive all or portions of specified cash inflows to a securitization vehicle and include senior and subordinated interests in principal, interest and/or other cash inflows. The proceeds from the sale of beneficial interests are used to pay the transferor for the financial assets sold to the securitization vehicle or to purchase securities which serve as collateral.

The firm accounts for a securitization as a sale when it has relinquished control over the transferred financial assets. Prior to securitization, the firm generally accounts for assets pending transfer at fair value and therefore does not typically recognize significant gains or losses upon the transfer of assets. Net revenues from underwriting activities are recognized in connection with the sales of the underlying beneficial interests to investors.

For transfers of financial assets that are not accounted for as sales, the assets remain in financial instruments owned and the transfer is accounted for as a collateralized financing, with the related interest expense recognized over the life of the transaction. See Note 10 for further information about collateralized financings and Note 23 for further information about interest expense.

The firm generally receives cash in exchange for the transferred assets but may also have continuing involvement with the transferred financial assets, including ownership of beneficial interests in securitized financial assets, primarily in the form of debt instruments. The firm may also purchase senior or subordinated securities issued by securitization vehicles (which are typically VIEs) in connection with secondary market-making activities.

The primary risks included in beneficial interests and other interests from the firm's continuing involvement with securitization vehicles are the performance of the underlying collateral, the position of the firm's investment in the capital structure of the securitization vehicle and the market yield for the security. These interests primarily are accounted for at fair value and classified in level 2 of the fair value hierarchy. Beneficial interests and other interests not accounted for at fair value are carried at amounts that approximate fair value. See Notes 5 through 8 for further information about fair value measurements.

The table below presents the amount of financial assets securitized and the cash flows received on retained interests in securitization entities in which the firm had continuing involvement as of the end of the period.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Residential mortgages | **$21,229** | $18,142 | $12,164 |
| Commercial mortgages | **8,745** | 7,872 | 233 |
| Other financial assets | **1,914** | 481 | 181 |
| **Total financial assets securitized** | **$31,888** | $26,495 | $12,578 |
| **Retained interests cash flows** | **$ 296** | $ 264 | $ 189 |

The table below presents information about nonconsolidated securitization entities to which the firm sold assets and has continuing involvement.

| *$ in millions* | Outstanding Principal Amount | Retained Interests | Purchased Interests |
|---|---|---|---|
| **As of December 2018** | | | |
| U.S. government agency-issued collateralized mortgage obligations | **$24,506** | **$1,758** | **$29** |
| Other residential mortgage-backed | **19,560** | **941** | **15** |
| Other commercial mortgage-backed | **15,088** | **448** | **10** |
| Corporate debt and other asset-backed | **3,311** | **133** | **3** |
| **Total** | **$62,465** | **$3,280** | **$57** |
| As of December 2017 | | | |
| U.S. government agency-issued collateralized mortgage obligations | $20,232 | $1,120 | $16 |
| Other residential mortgage-backed | 10,558 | 711 | 17 |
| Other commercial mortgage-backed | 7,916 | 228 | 7 |
| Corporate debt and other asset-backed | 2,108 | 56 | 1 |
| Total | $40,814 | $2,115 | $41 |

In the table above:

- The outstanding principal amount is presented for the purpose of providing information about the size of the securitization entities and is not representative of the firm's risk of loss.
- The firm's risk of loss from retained or purchased interests is limited to the carrying value of these interests.

- Purchased interests represent senior and subordinated interests, purchased in connection with secondary market-making activities, in securitization entities in which the firm also holds retained interests.
- Substantially all of the total outstanding principal amount and total retained interests relate to securitizations during 2014 and thereafter as of December 2018, and relate to securitizations during 2012 and thereafter as of December 2017.
- The fair value of retained interests was $3.28 billion as of December 2018 and $2.13 billion as of December 2017.

In addition to the interests in the table above, the firm had other continuing involvement in the form of derivative transactions and commitments with certain nonconsolidated VIEs. The carrying value of these derivatives and commitments was a net asset of $75 million as of December 2018 and $86 million as of December 2017, and the notional amount of these derivatives and commitments was $1.09 billion as of December 2018 and $1.26 billion as of December 2017. The notional amounts of these derivatives and commitments are included in maximum exposure to loss in the nonconsolidated VIE table in Note 12.

The table below presents information about the weighted average key economic assumptions used in measuring the fair value of mortgage-backed retained interests.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Fair value of retained interests | **$ 3,151** | $2,071 |
| Weighted average life (years) | **7.2** | 6.0 |
| Constant prepayment rate | **11.9%** | 9.4% |
| Impact of 10% adverse change | **$ (27)** | $ (19) |
| Impact of 20% adverse change | **$ (53)** | $ (35) |
| Discount rate | **4.7%** | 4.2% |
| Impact of 10% adverse change | **$ (75)** | $ (35) |
| Impact of 20% adverse change | **$ (147)** | $ (70) |

In the table above:

- Amounts do not reflect the benefit of other financial instruments that are held to mitigate risks inherent in these retained interests.
- Changes in fair value based on an adverse variation in assumptions generally cannot be extrapolated because the relationship of the change in assumptions to the change in fair value is not usually linear.
- The impact of a change in a particular assumption is calculated independently of changes in any other assumption. In practice, simultaneous changes in assumptions might magnify or counteract the sensitivities disclosed above.
- The constant prepayment rate is included only for positions for which it is a key assumption in the determination of fair value.
- The discount rate for retained interests that relate to U.S. government agency-issued collateralized mortgage obligations does not include any credit loss. Expected credit loss assumptions are reflected in the discount rate for the remainder of retained interests.

The firm has other retained interests not reflected in the table above with a fair value of $133 million and a weighted average life of 4.2 years as of December 2018, and a fair value of $56 million and a weighted average life of 4.5 years as of December 2017. Due to the nature and fair value of certain of these retained interests, the weighted average assumptions for constant prepayment and discount rates and the related sensitivity to adverse changes are not meaningful as of both December 2018 and December 2017. The firm's maximum exposure to adverse changes in the value of these interests is the carrying value of $133 million as of December 2018 and $56 million as of December 2017.

**Note 12.**

## Variable Interest Entities

A variable interest in a VIE is an investment (e.g., debt or equity) or other interest (e.g., derivatives or loans and lending commitments) that will absorb portions of the VIE's expected losses and/or receive portions of the VIE's expected residual returns.

The firm's variable interests in VIEs include senior and subordinated debt; loans and lending commitments; limited and general partnership interests; preferred and common equity; derivatives that may include foreign currency, equity and/or credit risk; guarantees; and certain of the fees the firm receives from investment funds. Certain interest rate, foreign currency and credit derivatives the firm enters into with VIEs are not variable interests because they create, rather than absorb, risk.

VIEs generally finance the purchase of assets by issuing debt and equity securities that are either collateralized by or indexed to the assets held by the VIE. The debt and equity securities issued by a VIE may include tranches of varying levels of subordination. The firm's involvement with VIEs includes securitization of financial assets, as described in Note 11, and investments in and loans to other types of VIEs, as described below. See Note 11 for further information about securitization activities, including the definition of beneficial interests. See Note 3 for the firm's consolidation policies, including the definition of a VIE.

### VIE Consolidation Analysis

The enterprise with a controlling financial interest in a VIE is known as the primary beneficiary and consolidates the VIE. The firm determines whether it is the primary beneficiary of a VIE by performing an analysis that principally considers:

- Which variable interest holder has the power to direct the activities of the VIE that most significantly impact the VIE's economic performance;
- Which variable interest holder has the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE;
- The VIE's purpose and design, including the risks the VIE was designed to create and pass through to its variable interest holders;
- The VIE's capital structure;
- The terms between the VIE and its variable interest holders and other parties involved with the VIE; and
- Related-party relationships.

The firm reassesses its evaluation of whether an entity is a VIE when certain reconsideration events occur. The firm reassesses its determination of whether it is the primary beneficiary of a VIE on an ongoing basis based on current facts and circumstances.

### VIE Activities

The firm is principally involved with VIEs through the following business activities:

**Mortgage-Backed VIEs.** The firm sells residential and commercial mortgage loans and securities to mortgage-backed VIEs and may retain beneficial interests in the assets sold to these VIEs. The firm purchases and sells beneficial interests issued by mortgage-backed VIEs in connection with market-making activities. In addition, the firm may enter into derivatives with certain of these VIEs, primarily interest rate swaps, which are typically not variable interests. The firm generally enters into derivatives with other counterparties to mitigate its risk.

**Real Estate, Credit- and Power-Related and Other Investing VIEs.** The firm purchases equity and debt securities issued by and makes loans to VIEs that hold real estate, performing and nonperforming debt, distressed loans, power-related assets and equity securities. The firm generally does not sell assets to, or enter into derivatives with, these VIEs.

**Corporate Debt and Other Asset-Backed VIEs.** The firm structures VIEs that issue notes to clients, purchases and sells beneficial interests issued by corporate debt and other asset-backed VIEs in connection with market-making activities, and makes loans to VIEs that warehouse corporate debt. Certain of these VIEs synthetically create the exposure for the beneficial interests they issue by entering into credit derivatives with the firm, rather than purchasing the underlying assets. In addition, the firm may enter into derivatives, such as total return swaps, with certain corporate debt and other asset-backed VIEs, under which the firm pays the VIE a return due to the beneficial interest holders and receives the return on the collateral owned by the VIE. The collateral owned by these VIEs is primarily other asset-backed loans and securities. The firm generally can be removed as the total return swap counterparty and enters into derivatives with other counterparties to mitigate its risk related to these swaps. The firm may sell assets to the corporate debt and other asset-backed VIEs it structures.

**Principal-Protected Note VIEs.** The firm structures VIEs that issue principal-protected notes to clients. These VIEs own portfolios of assets, principally with exposure to hedge funds. Substantially all of the principal protection on the notes issued by these VIEs is provided by the asset portfolio rebalancing that is required under the terms of the notes. The firm enters into total return swaps with these VIEs under which the firm pays the VIE the return due to the principal-protected note holders and receives the return on the assets owned by the VIE. The firm may enter into derivatives with other counterparties to mitigate its risk. The firm also obtains funding through these VIEs.

**Investments in Funds.** The firm makes equity investments in certain investment fund VIEs it manages and is entitled to receive fees from these VIEs. The firm generally does not sell assets to, or enter into derivatives with, these VIEs.

### Nonconsolidated VIEs

The table below presents a summary of the nonconsolidated VIEs in which the firm holds variable interests.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Total nonconsolidated VIEs** | | |
| Assets in VIEs | **$118,186** | $97,962 |
| Carrying value of variable interests — assets | **9,543** | 8,425 |
| Carrying value of variable interests — liabilities | **478** | 214 |
| **Maximum exposure to loss:** | | |
| Retained interests | **3,280** | 2,115 |
| Purchased interests | **983** | 1,172 |
| Commitments and guarantees | **2,745** | 3,462 |
| Derivatives | **8,975** | 8,644 |
| Loans and investments | **4,728** | 4,216 |
| **Total maximum exposure to loss** | **$ 20,711** | $19,609 |

In the table above:

- The nature of the firm's variable interests can take different forms, as described in the rows under maximum exposure to loss.
- The firm's exposure to the obligations of VIEs is generally limited to its interests in these entities. In certain instances, the firm provides guarantees, including derivative guarantees, to VIEs or holders of variable interests in VIEs.
- The maximum exposure to loss excludes the benefit of offsetting financial instruments that are held to mitigate the risks associated with these variable interests.
- The maximum exposure to loss from retained interests, purchased interests, and loans and investments is the carrying value of these interests.
- The maximum exposure to loss from commitments and guarantees, and derivatives is the notional amount, which does not represent anticipated losses and has not been reduced by unrealized losses. As a result, the maximum exposure to loss exceeds liabilities recorded for commitments and guarantees, and derivatives.

The table below disaggregates, by principal business activity, the information for nonconsolidated VIEs included in the summary table above.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Mortgage-backed** | | |
| Assets in VIEs | **$73,262** | $55,153 |
| Carrying value of variable interests — assets | **4,090** | 3,128 |
| **Maximum exposure to loss:** | | |
| Retained interests | **3,147** | 2,059 |
| Purchased interests | **941** | 1,067 |
| Commitments and guarantees | **35** | 11 |
| Derivatives | **77** | 99 |
| **Total maximum exposure to loss** | **$ 4,200** | $ 3,236 |
| **Real estate, credit- and power-related and other investing** | | |
| Assets in VIEs | **$18,851** | $15,539 |
| Carrying value of variable interests — assets | **3,601** | 3,289 |
| Carrying value of variable interests — liabilities | **20** | 2 |
| **Maximum exposure to loss:** | | |
| Commitments and guarantees | **1,543** | 1,617 |
| Derivatives | **113** | 238 |
| Loans and investments | **3,572** | 3,051 |
| **Total maximum exposure to loss** | **$ 5,228** | $ 4,906 |
| **Corporate debt and other asset-backed** | | |
| Assets in VIEs | **$15,842** | $16,251 |
| Carrying value of variable interests — assets | **1,563** | 1,660 |
| Carrying value of variable interests — liabilities | **458** | 212 |
| **Maximum exposure to loss:** | | |
| Retained interests | **133** | 56 |
| Purchased interests | **42** | 105 |
| Commitments and guarantees | **1,113** | 1,779 |
| Derivatives | **8,782** | 8,303 |
| Loans and investments | **867** | 817 |
| **Total maximum exposure to loss** | **$10,937** | $11,060 |
| **Investments in funds** | | |
| Assets in VIEs | **$10,231** | $11,019 |
| Carrying value of variable interests — assets | **289** | 348 |
| **Maximum exposure to loss:** | | |
| Commitments and guarantees | **54** | 55 |
| Derivatives | **3** | 4 |
| Loans and investments | **289** | 348 |
| **Total maximum exposure to loss** | **$ 346** | $ 407 |

As of both December 2018 and December 2017, the carrying values of the firm's variable interests in nonconsolidated VIEs are included in the consolidated statements of financial condition as follows:

- Mortgage-backed: Assets were primarily included in financial instruments owned.
- Real estate, credit- and power-related and other investing: Assets were primarily included in financial instruments owned and liabilities were included in financial instruments sold, but not yet purchased and other liabilities.
- Corporate debt and other asset-backed: Assets were primarily included in loans receivable and liabilities were included in financial instruments sold, but not yet purchased.
- Investments in funds: Assets were included in financial instruments owned.

### Consolidated VIEs

The table below presents a summary of the carrying value and classification of assets and liabilities in consolidated VIEs.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Total consolidated VIEs** | | |
| *Assets* | | |
| Cash and cash equivalents | **$ 84** | $ 275 |
| Customer and other receivables | **2** | 2 |
| Loans receivable | **319** | 427 |
| Financial instruments owned | **2,034** | 1,194 |
| Other assets | **1,261** | 1,273 |
| **Total** | **$3,700** | $3,171 |
| *Liabilities* | | |
| Other secured financings | **$1,204** | $1,023 |
| Financial instruments sold, but not yet purchased | **20** | 15 |
| Unsecured short-term borrowings | **45** | 79 |
| Unsecured long-term borrowings | **207** | 225 |
| Other liabilities | **1,100** | 577 |
| **Total** | **$2,576** | $1,919 |

In the table above:

- Assets and liabilities are presented net of intercompany eliminations and exclude the benefit of offsetting financial instruments that are held to mitigate the risks associated with the firm's variable interests.
- VIEs in which the firm holds a majority voting interest are excluded if (i) the VIE meets the definition of a business and (ii) the VIE's assets can be used for purposes other than the settlement of its obligations.
- Substantially all assets can only be used to settle obligations of the VIE.

The table below disaggregates, by principal business activity, the information for consolidated VIEs included in the summary table above.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Real estate, credit-related and other investing** | | |
| *Assets* | | |
| Cash and cash equivalents | **$ 84** | $ 275 |
| Loans receivable | **269** | 375 |
| Financial instruments owned | **1,815** | 896 |
| Other assets | **1,258** | 1,267 |
| **Total** | **$ 3,426** | $ 2,813 |
| *Liabilities* | | |
| Other secured financings | **$ 596** | $ 327 |
| Financial instruments sold, but not yet purchased | **20** | 15 |
| Other liabilities | **1,100** | 577 |
| **Total** | **$ 1,716** | $ 919 |
| **Mortgage-backed and other asset-backed** | | |
| *Assets* | | |
| Customer and other receivables | **$ 2** | $ 2 |
| Loans receivable | **50** | 52 |
| Financial instruments owned | **210** | 242 |
| Other assets | **3** | 6 |
| **Total** | **$ 265** | $ 302 |
| *Liabilities* | | |
| Other secured financings | **$ 140** | $ 207 |
| **Total** | **$ 140** | $ 207 |
| **Principal-protected notes** | | |
| *Assets* | | |
| Financial instruments owned | **$ 9** | $ 56 |
| **Total** | **$ 9** | $ 56 |
| *Liabilities* | | |
| Other secured financings | **$ 468** | $ 489 |
| Unsecured short-term borrowings | **45** | 79 |
| Unsecured long-term borrowings | **207** | 225 |
| **Total** | **$ 720** | $ 793 |

In the table above:

- The majority of the assets in principal-protected notes VIEs are intercompany and are eliminated in consolidation.
- Creditors and beneficial interest holders of real estate, credit-related and other investing VIEs, and mortgage-backed and other asset-backed VIEs do not have recourse to the general credit of the firm.

### Note 13.

## Other Assets

The table below presents other assets by type.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Property, leasehold improvements and equipment | **$18,317** | $15,094 |
| Goodwill and identifiable intangible assets | **4,082** | 4,038 |
| Income tax-related assets | **1,529** | 3,728 |
| Miscellaneous receivables and other | **6,712** | 5,486 |
| **Total** | **$30,640** | $28,346 |

In the table above:

- Property, leasehold improvements and equipment is net of accumulated depreciation and amortization of \$9.08 billion as of December 2018 and \$8.28 billion as of December 2017. Property, leasehold improvements and equipment included \$5.57 billion as of December 2018 and \$5.97 billion as of December 2017 that the firm uses in connection with its operations, and \$896 million as of December 2018 and \$982 million as of December 2017 of foreclosed real estate primarily related to PCI loans. The remainder is held by investment entities, including VIEs, consolidated by the firm. Substantially all property and equipment is depreciated on a straight-line basis over the useful life of the asset. Leasehold improvements are amortized on a straight-line basis over the shorter of the useful life of the improvement or the term of the lease. Capitalized costs of software developed or obtained for internal use are amortized on a straight-line basis over three years.
- The decrease in income tax-related assets from December 2017 to December 2018 reflected a decrease in net current tax receivables, as the net deferred tax liability related to the Tax Legislation repatriation tax became current and was netted against current tax receivables. See Note 24 for further information about Tax Legislation.
- Miscellaneous receivables and other included debt securities accounted for as held-to-maturity of \$1.29 billion as of December 2018 and \$800 million as of December 2017. As of December 2018, these securities were primarily backed by residential real estate and had maturities of greater than ten years. As of December 2017 these securities were backed by residential real estate and had maturities of greater than ten years. Held-to-maturity securities are carried at amortized cost and the carrying value of these securities approximated fair value as of both December 2018 and December 2017. As these securities are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these securities been included in the firm's fair value hierarchy, they would have been primarily classified in level 2 as of December 2018 and substantially all would have been classified in level 2 as of December 2017.
- Miscellaneous receivables and other included investments in qualified affordable housing projects of \$653 million as of December 2018 and \$679 million as of December 2017.

- Miscellaneous receivables and other included assets classified as held for sale of $1.01 billion as of December 2018 related to the firm's new European headquarters in London. During the third quarter of 2018, the firm entered into a sale and leaseback agreement, which closed in January 2019, to sell this property for $1.53 billion. The assets were classified as held for sale during the fourth quarter of 2018 when the construction of the property was substantially completed. Substantially all of the sale proceeds in excess of the carrying value of the property will be recognized over the life of the lease as a reduction to occupancy expense. In accordance with ASU No. 2016-02, the firm recorded a right-of-use asset upon the closing of the sale and lease back agreement in January 2019. See Note 3 for information about ASU No. 2016-02.
- Miscellaneous receivables and other included other assets classified as held for sale of $365 million as of December 2018 and $634 million as of December 2017 related to the firm's consolidated investments within its Investing & Lending segment, substantially all of which consisted of property and equipment.
- Miscellaneous receivables and other included equity-method investments of $357 million as of December 2018 and $275 million as of December 2017.

### Goodwill and Identifiable Intangible Assets

**Goodwill.** The table below presents the carrying value of goodwill.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Investment Banking: | | |
| Financial Advisory | **$ 98** | $ 98 |
| Underwriting | **183** | 183 |
| Institutional Client Services: | | |
| FICC Client Execution | **269** | 269 |
| Equities client execution | **2,403** | 2,403 |
| Securities services | **105** | 105 |
| Investing & Lending | **91** | 2 |
| Investment Management | **609** | 605 |
| **Total** | **$3,758** | $3,665 |

Goodwill is the cost of acquired companies in excess of the fair value of net assets, including identifiable intangible assets, at the acquisition date.

Goodwill is assessed for impairment annually in the fourth quarter or more frequently if events occur or circumstances change that indicate an impairment may exist. When assessing goodwill for impairment, first, qualitative factors are assessed to determine whether it is more likely than not that the estimated fair value of a reporting unit is less than its estimated carrying value. If the results of the qualitative assessment are not conclusive, a quantitative goodwill test is performed.

The quantitative goodwill test compares the estimated fair value of each reporting unit with its estimated net book value (including goodwill and identifiable intangible assets). If the reporting unit's estimated fair value exceeds its estimated net book value, goodwill is not impaired. An impairment is recognized if the estimated fair value of a reporting unit is less than its estimated net book value. To estimate the fair value of each reporting unit, a relative value technique is used because the firm believes market participants would use this technique to value the firm's reporting units. The relative value technique applies observable price-to-earnings multiples or price-to-book multiples and projected return on equity of comparable competitors to reporting units' net earnings or net book value. The estimated net book value of each reporting unit reflects an allocation of total shareholders' equity and represents the estimated amount of total shareholders' equity required to support the activities of the reporting unit under currently applicable regulatory capital requirements.

In the fourth quarter of 2018, the firm assessed goodwill for impairment for each of its reporting units by performing a qualitative assessment. Multiple factors were assessed with respect to each of the firm's reporting units to determine whether it was more likely than not that the estimated fair value of any of these reporting units was less than its estimated carrying value. The qualitative assessment also considered changes since the prior quantitative tests.

The firm considered the following factors in the qualitative assessment performed in the fourth quarter when evaluating whether it was more likely than not that the fair value of a reporting unit was less than its carrying value:

- **Performance Indicators.** During 2018, the firm's net revenues, diluted earnings per common share, return on average common shareholders' equity (ROE) and book value per common share all increased compared with 2017. The firm's operating expenses increased, reflecting investments in growth and higher client activity. Despite the increase in expenses, the efficiency ratio (total operating expenses divided by total net revenues) and pre-tax margin for 2018 remained stable compared with 2017 and there were no significant negative changes to the firm's overall cost structure since the prior quantitative goodwill tests were performed.
- **Firm and Industry Events.** There were no events, entity-specific or otherwise, that would have had a significant negative impact on the valuation of the firm's reporting units.
- **Macroeconomic Indicators.** Since the prior quantitative goodwill tests, the firm's general operating environment improved amid stronger global economic growth.

- **Fair Value Indicators.** Since the prior quantitative goodwill tests, fair value indicators in the market improved as global equity prices generally increased and credit spreads generally tightened. For the firm and most publicly traded participants in its industry, stock prices increased since the prior tests. In addition, price-to-book multiples generally remained greater than 1.0x and price-to-earnings multiples, while generally lower, remained relatively solid.

As a result of the qualitative assessment, the firm determined that it was more likely than not that the estimated fair value of each of the reporting units exceeded its respective carrying value. Therefore, the firm determined that goodwill for each reporting unit was not impaired and that a quantitative goodwill test was not required.

Subsequent to the qualitative assessment, the firm's stock price declined towards the end of the year. Due to the short period of time of this decline and continued favorable outlook for the firm's performance, the firm determined that this was not a triggering event for further assessment.

**Identifiable Intangible Assets.** The table below presents identifiable intangible assets by segment and type.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **By Segment** | | |
| Institutional Client Services: | | |
| FICC Client Execution | **$ 10** | $ 37 |
| Equities client execution | **37** | 88 |
| Investing & Lending | **178** | 140 |
| Investment Management | **99** | 108 |
| **Total** | **$ 324** | $ 373 |
| **By Type** | | |
| **Customer lists** | | |
| Gross carrying value | **$ 1,117** | $ 1,091 |
| Accumulated amortization | **(970)** | (903) |
| Net carrying value | **147** | 188 |
| **Acquired leases and other** | | |
| Gross carrying value | **636** | 584 |
| Accumulated amortization | **(459)** | (399) |
| Net carrying value | **177** | 185 |
| **Total gross carrying value** | **1,753** | 1,675 |
| **Total accumulated amortization** | **(1,429)** | (1,302) |
| **Total net carrying value** | **$ 324** | $ 373 |

The firm acquired $137 million of intangible assets during 2018, primarily related to acquired leases, with a weighted average amortization period of four years. The firm acquired $113 million of intangible assets during 2017, primarily related to acquired leases, with a weighted average amortization period of five years.

Substantially all of the firm's identifiable intangible assets are considered to have finite useful lives and are amortized over their estimated useful lives generally using the straight-line method.

The tables below present information about amortization of identifiable intangible assets.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Amortization | **$152** | $150 | $162 |

| *$ in millions* | **As of December 2018** |
|---|---|
| **Estimated future amortization** | |
| 2019 | **$113** |
| 2020 | **$ 56** |
| 2021 | **$ 42** |
| 2022 | **$ 32** |
| 2023 | **$ 27** |

### Impairments

The firm tests property, leasehold improvements and equipment, identifiable intangible assets and other assets for impairment whenever events or changes in circumstances suggest that an asset's or asset group's carrying value may not be fully recoverable. To the extent the carrying value of an asset exceeds the projected undiscounted cash flows expected to result from the use and eventual disposal of the asset or asset group, the firm determines the asset is impaired and records an impairment equal to the difference between the estimated fair value and the carrying value of the asset or asset group. In addition, the firm will recognize an impairment prior to the sale of an asset if the carrying value of the asset exceeds its estimated fair value.

During 2018, 2017 and 2016, impairments were not material to the firm's results of operations or financial condition.

**Note 14.**

## Deposits

The table below presents the types and sources of deposits.

| *$ in millions* | Savings and Demand | Time | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| Private bank deposits | **$52,028** | **$ 2,311** | **$ 54,339** |
| Consumer deposits | **27,987** | **7,641** | **35,628** |
| Brokered certificates of deposit | **–** | **35,876** | **35,876** |
| Deposit sweep programs | **15,903** | **–** | **15,903** |
| Institutional deposits | **1** | **16,510** | **16,511** |
| **Total** | **$95,919** | **$62,338** | **$158,257** |
| As of December 2017 | | | |
| Private bank deposits | $50,579 | $ 1,623 | $ 52,202 |
| Consumer deposits | 13,787 | 3,330 | 17,117 |
| Brokered certificates of deposit | – | 35,704 | 35,704 |
| Deposit sweep programs | 16,019 | – | 16,019 |
| Institutional deposits | 1 | 17,561 | 17,562 |
| Total | $80,386 | $58,218 | $138,604 |

In the table above:

- Substantially all deposits are interest-bearing.
- Savings and demand accounts consist of money market deposit accounts, negotiable order of withdrawal accounts and demand deposit accounts that have no stated maturity or expiration date.
- Time deposits included $21.06 billion as of December 2018 and $22.90 billion as of December 2017 of deposits accounted for at fair value under the fair value option. See Note 8 for further information about deposits accounted for at fair value.
- Time deposits had a weighted average maturity of approximately 1.8 years as of December 2018 and 2.0 years as of December 2017.
- Deposit sweep programs represent long-term contractual agreements with several U.S. broker-dealers who sweep client cash to FDIC-insured deposits. As of both December 2018 and December 2017, the firm had eight deposit sweep program contractual arrangements.
- Deposits insured by the FDIC were $86.27 billion as of December 2018 and $75.02 billion as of December 2017.
- Deposits insured by the U.K.'s Financial Services Compensation Scheme were $6.05 billion as of December 2018 and $227 million as of December 2017.

The table below presents deposits held in U.S. and non-U.S. offices.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| U.S. offices | **$126,444** | $111,002 |
| Non-U.S. offices | **31,813** | 27,602 |
| **Total** | **$158,257** | $138,604 |

In the table above, U.S. deposits were held at Goldman Sachs Bank USA (GS Bank USA) and substantially all non-U.S. deposits were held at Goldman Sachs International Bank (GSIB).

The table below presents maturities of time deposits held in U.S. and non-U.S. offices.

| | **As of December 2018** | | |
|---|---|---|---|
| *$ in millions* | **U.S.** | **Non-U.S.** | **Total** |
| 2019 | **$18,787** | **$ 15,138** | **$ 33,925** |
| 2020 | **7,328** | **941** | **8,269** |
| 2021 | **5,512** | **41** | **5,553** |
| 2022 | **5,142** | **83** | **5,225** |
| 2023 | **4,546** | **57** | **4,603** |
| 2024 - thereafter | **3,901** | **862** | **4,763** |
| **Total** | **$45,216** | **$ 17,122** | **$ 62,338** |

As of December 2018, deposits in U.S. offices included $3.78 billion and non-U.S. offices included $17.12 billion of time deposits in denominations that met or exceeded the applicable insurance limits, or were otherwise not covered by insurance.

The firm's savings and demand deposits are recorded based on the amount of cash received plus accrued interest, which approximates fair value. In addition, the firm designates certain derivatives as fair value hedges to convert a portion of its time deposits not accounted for at fair value from fixed-rate obligations into floating-rate obligations. The carrying value of time deposits not accounted for at fair value approximated fair value as of both December 2018 and December 2017. As these savings and demand deposits and time deposits are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these deposits been included in the firm's fair value hierarchy, they would have been classified in level 2 as of both December 2018 and December 2017.

**Note 15.**

## Short-Term Borrowings

The table below presents information about short-term borrowings.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Other secured financings (short-term) | **$ 9,555** | $14,896 |
| Unsecured short-term borrowings | **40,502** | 46,922 |
| **Total** | **$50,057** | $61,818 |

See Note 10 for information about other secured financings.

Unsecured short-term borrowings includes the portion of unsecured long-term borrowings maturing within one year of the financial statement date and unsecured long-term borrowings that are redeemable within one year of the financial statement date at the option of the holder.

The firm accounts for certain hybrid financial instruments at fair value under the fair value option. See Note 8 for further information about unsecured short-term borrowings that are accounted for at fair value. In addition, the firm designates certain derivatives as fair value hedges to convert a portion of its unsecured short-term borrowings not accounted for at fair value from fixed-rate obligations into floating-rate obligations. The carrying value of unsecured short-term borrowings that are not recorded at fair value generally approximates fair value due to the short-term nature of the obligations. As these unsecured short-term borrowings are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these borrowings been included in the firm's fair value hierarchy, substantially all would have been classified in level 2 as of both December 2018 and December 2017.

The table below presents information about unsecured short-term borrowings.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Current portion of unsecured long-term borrowings | **$27,476** | $30,090 |
| Hybrid financial instruments | **10,908** | 12,973 |
| Other unsecured short-term borrowings | **2,118** | 3,859 |
| **Total unsecured short-term borrowings** | **$40,502** | $46,922 |
| **Weighted average interest rate** | **2.51%** | 2.28% |

In the table above:

- The current portion of unsecured long-term borrowings included $20.91 billion as of December 2018 and $26.28 billion as of December 2017 issued by Group Inc.
- The weighted average interest rates for these borrowings include the effect of hedging activities and exclude unsecured short-term borrowings accounted for at fair value under the fair value option. See Note 7 for further information about hedging activities.

**Note 16.**

## Long-Term Borrowings

The table below presents information about long-term borrowings.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Other secured financings (long-term) | **$ 11,878** | $ 9,892 |
| Unsecured long-term borrowings | **224,149** | 217,687 |
| **Total** | **$236,027** | $227,579 |

See Note 10 for information about other secured financings.

The table below presents information about unsecured long-term borrowings.

| *$ in millions* | U.S. Dollar | Non-U.S. Dollar | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| Fixed-rate obligations: | | | |
| Group Inc. | **$ 97,354** | **$34,030** | **$131,384** |
| Subsidiaries | **2,581** | **2,624** | **5,205** |
| Floating-rate obligations: | | | |
| Group Inc. | **30,565** | **21,157** | **51,722** |
| Subsidiaries | **23,756** | **12,082** | **35,838** |
| **Total** | **$154,256** | **$69,893** | **$224,149** |
| As of December 2017 | | | |
| Fixed-rate obligations: | | | |
| Group Inc. | $101,791 | $35,116 | $136,907 |
| Subsidiaries | 2,244 | 1,859 | 4,103 |
| Floating-rate obligations: | | | |
| Group Inc. | 29,637 | 23,938 | 53,575 |
| Subsidiaries | 14,977 | 8,125 | 23,102 |
| Total | $148,649 | $69,038 | $217,687 |

In the table above:

- Unsecured long-term borrowings consists principally of senior borrowings, which have maturities extending through 2067.
- Floating-rate obligations includes equity-linked and indexed instruments. Floating interest rates are generally based on LIBOR or Euro Interbank Offered Rate.
- U.S. dollar-denominated debt had interest rates ranging from 2.00% to 10.04% (with a weighted average rate of 4.22%) as of December 2018 and 1.60% to 10.04% (with a weighted average rate of 4.24%) as of December 2017. These rates exclude unsecured long-term borrowings accounted for at fair value under the fair value option.
- Non-U.S. dollar-denominated debt had interest rates ranging from 0.31% to 13.00% (with a weighted average rate of 2.43%) as of December 2018 and 0.31% to 13.00% (with a weighted average rate of 2.60%) as of December 2017. These rates exclude unsecured long-term borrowings accounted for at fair value under the fair value option.

The table below presents unsecured long-term borrowings by maturity.

| | As of December 2018 | | |
|---|---|---|---|
| *$ in millions* | **Group Inc.** | **Subsidiaries** | **Total** |
| 2020 | **$ 22,343** | **$ 7,028** | **$ 29,371** |
| 2021 | **20,128** | **2,836** | **22,964** |
| 2022 | **21,191** | **2,268** | **23,459** |
| 2023 | **21,566** | **6,306** | **27,872** |
| 2024 - thereafter | **97,878** | **22,605** | **120,483** |
| **Total** | **$183,106** | **$41,043** | **$224,149** |

In the table above:

- Unsecured long-term borrowings maturing within one year of the financial statement date and unsecured long-term borrowings that are redeemable within one year of the financial statement date at the option of the holder are excluded as they are included in unsecured short-term borrowings.
- Unsecured long-term borrowings that are repayable prior to maturity at the option of the firm are reflected at their contractual maturity dates.
- Unsecured long-term borrowings that are redeemable prior to maturity at the option of the holder are reflected at the earliest dates such options become exercisable.
- Unsecured long-term borrowings included $4.24 billion of adjustments to the carrying value of certain unsecured long-term borrowings resulting from the application of hedge accounting by year of maturity as follows: $94 million in 2020, $259 million in 2021, $(69) million in 2022, $(36) million in 2023, and $3.99 billion in 2024 and thereafter.

During 2018, the firm repurchased unsecured short-term and long-term borrowings with a principal amount of $4.10 billion (carrying value of $4.53 billion) for $4.37 billion and recognized a net gain of $160 million, of which $112 million was included in the Institutional Client Services segment and $48 million was included in the Investing & Lending segment.

The firm designates certain derivatives as fair value hedges to convert a portion of fixed-rate unsecured long-term borrowings not accounted for at fair value into floating-rate obligations. See Note 7 for further information about hedging activities.

The table below presents unsecured long-term borrowings, after giving effect to such hedging activities.

| *$ in millions* | Group Inc. | Subsidiaries | Total |
|---|---|---|---|
| **As of December 2018** | | | |
| Fixed-rate obligations: | | | |
| At fair value | **$ –** | **$ 28** | **$ 28** |
| At amortized cost | **71,221** | **3,331** | **74,552** |
| Floating-rate obligations: | | | |
| At fair value | **16,387** | **30,169** | **46,556** |
| At amortized cost | **95,498** | **7,515** | **103,013** |
| **Total** | **$183,106** | **$41,043** | **$224,149** |
| As of December 2017 | | | |
| Fixed-rate obligations: | | | |
| At fair value | $ – | $ 147 | $ 147 |
| At amortized cost | 86,951 | 3,852 | 90,803 |
| Floating-rate obligations: | | | |
| At fair value | 18,207 | 20,284 | 38,491 |
| At amortized cost | 85,324 | 2,922 | 88,246 |
| Total | $190,482 | $27,205 | $217,687 |

In the table above, the aggregate amounts of unsecured long-term borrowings had weighted average interest rates of 3.21% (3.79% related to fixed-rate obligations and 2.79% related to floating-rate obligations) as of December 2018 and 2.86% (3.67% related to fixed-rate obligations and 2.02% related to floating-rate obligations) as of December 2017. These rates exclude unsecured long-term borrowings accounted for at fair value under the fair value option.

As of December 2018 and December 2017, the carrying value of unsecured long-term borrowings for which the firm did not elect the fair value option approximated fair value. As these borrowings are not accounted for at fair value, they are not included in the firm's fair value hierarchy in Notes 5 through 8. Had these borrowings been included in the firm's fair value hierarchy, substantially all would have been classified in level 2 as of both December 2018 and December 2017.

### Subordinated Borrowings

Unsecured long-term borrowings includes subordinated debt and junior subordinated debt. Junior subordinated debt is junior in right of payment to other subordinated borrowings, which are junior to senior borrowings. Subordinated debt had maturities ranging from 2021 to 2045 as of December 2018 and 2020 to 2045 as of December 2017. Subordinated debt that matures within one year is included in unsecured short-term borrowings.

The table below presents information about subordinated borrowings.

| *$ in millions* | Par Amount | Carrying Value | Rate |
|---|---|---|---|
| **As of December 2018** | | | |
| Subordinated debt | **$14,023** | **$15,703** | **4.09%** |
| Junior subordinated debt | **1,140** | **1,425** | **3.19%** |
| **Total** | **$15,163** | **$17,128** | **4.02%** |
| As of December 2017 | | | |
| Subordinated debt | $14,117 | $16,235 | 3.31% |
| Junior subordinated debt | 1,168 | 1,539 | 2.37% |
| Total | $15,285 | $17,774 | 3.24% |

In the table above:

- The par amount of subordinated debt issued by Group Inc. was $14.02 billion as of December 2018 and $13.96 billion as of December 2017, and the carrying value of subordinated debt issued by Group Inc. was $15.70 billion as of December 2018 and $16.08 billion as of December 2017.
- The rate is the weighted average interest rate for these borrowings (excluding borrowings accounted for at fair value under the fair value option), including the effect of fair value hedges used to convert fixed-rate obligations into floating-rate obligations. See Note 7 for further information about hedging activities.

### Junior Subordinated Debt

In 2004, Group Inc. issued $2.84 billion of junior subordinated debt to Goldman Sachs Capital I (Trust), a Delaware statutory trust. The Trust issued $2.75 billion of guaranteed preferred beneficial interests (Trust Preferred Securities) to third parties and $85 million of common beneficial interests to Group Inc. and used the proceeds from the issuances to purchase the junior subordinated debt from Group Inc. As of December 2018, the outstanding par amount of junior subordinated debt held by the Trust was $1.14 billion and the outstanding par amount of Trust Preferred Securities and common beneficial interests issued by the Trust was $1.11 billion and $34.1 million, respectively. During 2018, the firm purchased $27.8 million (par amount) of Trust Preferred Securities and delivered these securities, along with $1.0 million of common beneficial interests, to the Trust in exchange for a corresponding par amount of the junior subordinated debt. Following the exchanges, these Trust Preferred Securities, common beneficial interests and junior subordinated debt were extinguished. As of December 2017, the outstanding par amount of junior subordinated debt held by the Trust was $1.17 billion and the outstanding par amount of Trust Preferred Securities and common beneficial interests issued by the Trust was $1.13 billion and $35.1 million, respectively. The Trust is a wholly-owned finance subsidiary of the firm for regulatory and legal purposes but is not consolidated for accounting purposes.

The firm pays interest semi-annually on the junior subordinated debt at an annual rate of 6.345% and the debt matures on February 15, 2034. The coupon rate and the payment dates applicable to the beneficial interests are the same as the interest rate and payment dates for the junior subordinated debt. The firm has the right, from time to time, to defer payment of interest on the junior subordinated debt, and therefore cause payment on the Trust's preferred beneficial interests to be deferred, in each case up to ten consecutive semi-annual periods. During any such deferral period, the firm will not be permitted to, among other things, pay dividends on or make certain repurchases of its common stock. The Trust is not permitted to pay any distributions on the common beneficial interests held by Group Inc. unless all dividends payable on the preferred beneficial interests have been paid in full.

The firm has covenanted in favor of the holders of Group Inc.'s 6.345% junior subordinated debt due February 15, 2034, that, subject to certain exceptions, the firm will not redeem or purchase the capital securities issued by Goldman Sachs Capital II and Goldman Sachs Capital III (APEX Trusts) or shares of Group Inc.'s Perpetual Non-Cumulative Preferred Stock, Series E (Series E Preferred Stock), Perpetual Non-Cumulative Preferred Stock, Series F (Series F Preferred Stock) or Perpetual Non-Cumulative Preferred Stock, Series O, if the redemption or purchase results in less than $253 million aggregate liquidation preference of that series outstanding, prior to specified dates in 2022 for a price that exceeds a maximum amount determined by reference to the net cash proceeds that the firm has received from the sale of qualifying securities.

The APEX Trusts hold Group Inc.'s Series E Preferred Stock and Series F Preferred Stock. These trusts are Delaware statutory trusts sponsored by the firm and wholly-owned finance subsidiaries of the firm for regulatory and legal purposes but are not consolidated for accounting purposes.

## Note 17.
## Other Liabilities

The table below presents other liabilities by type.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Compensation and benefits | **$ 6,834** | $ 6,710 |
| Income tax-related liabilities | **2,864** | 4,051 |
| Noncontrolling interests | **1,568** | 553 |
| Employee interests in consolidated funds | **122** | 156 |
| Accrued expenses and other | **6,219** | 5,452 |
| **Total** | **$17,607** | $16,922 |

In the table above:

- The decrease in income tax-related liabilities from December 2017 to December 2018 reflected a decrease in the net deferred tax liability related to the Tax Legislation repatriation tax, which became current and was netted against current tax receivables. See Note 24 for further information about Tax Legislation.
- The increase in noncontrolling interests from December 2017 to December 2018 primarily reflected a noncontrolling interest in a consolidated special purpose acquisition company, which completed its initial public offering during the second quarter of 2018.
- Beginning in January 2018, accrued expenses and other includes contract liabilities, which represent consideration received by the firm, in connection with its contracts with clients, prior to providing the service. As of December 2018, the firm's contract liabilities were not material.

## Note 18.
## Commitments, Contingencies and Guarantees

### Commitments

The table below presents commitments by type.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Commercial lending: | | |
| Investment-grade | **$ 81,729** | $ 93,115 |
| Non-investment-grade | **51,793** | 45,291 |
| Warehouse financing | **4,060** | 5,340 |
| Total lending commitments | **137,582** | 143,746 |
| Contingent and forward starting collateralized agreements | **54,480** | 41,756 |
| Forward starting collateralized financings | **15,429** | 16,902 |
| Letters of credit | **445** | 437 |
| Investment commitments | **7,595** | 6,840 |
| Other | **4,892** | 6,310 |
| **Total commitments** | **$220,423** | $215,991 |

The table below presents commitments by expiration.

| | As of December 2018 | | | |
|---|---|---|---|---|
| *$ in millions* | **2019** | **2020 - 2021** | **2022 - 2023** | **2024 - Thereafter** |
| Commercial lending: | | | | |
| Investment-grade | **$13,101** | **$27,859** | **$39,409** | **$ 1,360** |
| Non-investment-grade | **4,884** | **11,851** | **26,803** | **8,255** |
| Warehouse financing | **699** | **2,143** | **589** | **629** |
| Total lending commitments | **18,684** | **41,853** | **66,801** | **10,244** |
| Contingent and forward starting collateralized agreements | **54,477** | **–** | **3** | **–** |
| Forward starting collateralized financings | **15,429** | **–** | **–** | **–** |
| Letters of credit | **401** | **1** | **3** | **40** |
| Investment commitments | **3,587** | **819** | **1,203** | **1,986** |
| Other | **4,815** | **77** | **–** | **–** |
| **Total commitments** | **$97,393** | **$42,750** | **$68,010** | **$12,270** |

### Lending Commitments

The firm's lending commitments are agreements to lend with fixed termination dates and depend on the satisfaction of all contractual conditions to borrowing. These commitments are presented net of amounts syndicated to third parties. The total commitment amount does not necessarily reflect actual future cash flows because the firm may syndicate all or substantial additional portions of these commitments. In addition, commitments can expire unused or be reduced or cancelled at the counterparty's request.

The table below presents information about lending commitments.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Held for investment | **$120,997** | $124,504 |
| Held for sale | **8,602** | 9,838 |
| At fair value | **7,983** | 9,404 |
| **Total** | **$137,582** | $143,746 |

In the table above:

- Held for investment lending commitments are accounted for on an accrual basis. See Note 9 for further information about such commitments.
- Held for sale lending commitments are accounted for at the lower of cost or fair value.
- Gains or losses related to lending commitments at fair value, if any, are generally recorded, net of any fees in other principal transactions.
- Substantially all lending commitments relates to the firm's Investing & Lending segment.

**Commercial Lending.** The firm's commercial lending commitments were primarily extended to investment-grade corporate borrowers. Such commitments included $93.99 billion as of December 2018 and $85.98 billion as of December 2017, related to relationship lending activities (principally used for operating and general corporate purposes) and $27.92 billion as of December 2018 and $42.41 billion as of December 2017, related to other investment banking activities (generally extended for contingent acquisition financing and are often intended to be short-term in nature, as borrowers often seek to replace them with other funding sources). The firm also extends lending commitments in connection with other types of corporate lending, as well as commercial real estate financing. See Note 9 for further information about funded loans.

Sumitomo Mitsui Financial Group, Inc. (SMFG) provides the firm with credit loss protection on certain approved loan commitments (primarily investment-grade commercial lending commitments). The notional amount of such loan commitments was $15.52 billion as of December 2018 and $25.70 billion as of December 2017. The credit loss protection on loan commitments provided by SMFG is generally limited to 95% of the first loss the firm realizes on such commitments, up to a maximum of approximately $950 million. In addition, subject to the satisfaction of certain conditions, upon the firm's request, SMFG will provide protection for 70% of additional losses on such commitments, up to a maximum of $1.0 billion, of which $550 million of protection had been provided as of both December 2018 and December 2017. The firm also uses other financial instruments to mitigate credit risks related to certain commitments not covered by SMFG. These instruments primarily include credit default swaps that reference the same or similar underlying instrument or entity, or credit default swaps that reference a market index.

**Warehouse Financing.** The firm provides financing to clients who warehouse financial assets. These arrangements are secured by the warehoused assets, primarily consisting of consumer and corporate loans.

### Contingent and Forward Starting Collateralized Agreements / Forward Starting Collateralized Financings

Forward starting collateralized agreements includes resale and securities borrowing agreements, and forward starting collateralized financings includes repurchase and secured lending agreements that settle at a future date, generally within three business days. The firm also enters into commitments to provide contingent financing to its clients and counterparties through resale agreements. The firm's funding of these commitments depends on the satisfaction of all contractual conditions to the resale agreement and these commitments can expire unused.

### Letters of Credit

The firm has commitments under letters of credit issued by various banks which the firm provides to counterparties in lieu of securities or cash to satisfy various collateral and margin deposit requirements.

### Investment Commitments

Investment commitments includes commitments to invest in private equity, real estate and other assets directly and through funds that the firm raises and manages. Investment commitments included $2.42 billion as of December 2018 and $2.09 billion as of December 2017, related to commitments to invest in funds managed by the firm. If these commitments are called, they would be funded at market value on the date of investment.

### Leases

The firm has contractual obligations under long-term noncancelable lease agreements for office space expiring on various dates through 2069. Certain agreements are subject to periodic escalation provisions for increases in real estate taxes and other charges.

The table below presents future minimum rental payments, net of minimum sublease rentals.

| *$ in millions* | As of December 2018 |
|---|---|
| 2019 | **$ 281** |
| 2020 | **271** |
| 2021 | **218** |
| 2022 | **177** |
| 2023 | **142** |
| 2024 - thereafter | **1,310** |
| **Total** | **$2,399** |

Rent charged to operating expense was $292 million for 2018, $273 million for 2017 and $244 million for 2016.

The amounts in the table above do not include lease payments arising from the sale and leaseback of the firm's new European headquarters as this agreement closed in January 2019. See Note 13 for further information about the sale and leaseback agreement.

Operating leases include office space held in excess of current requirements. Rent expense relating to space held for growth is included in occupancy expenses. The firm records a liability, based on the fair value of the remaining lease rentals reduced by any potential or existing sublease rentals, for leases where the firm has ceased using the space and management has concluded that the firm will not derive any future economic benefits. Costs to terminate a lease before the end of its term are recognized and measured at fair value on termination. Total occupancy expenses for space held in excess of the firm's current requirements and exit costs related to its office space were not material for both 2018 and 2017, and were approximately $68 million for 2016.

### Contingencies

**Legal Proceedings.** See Note 27 for information about legal proceedings, including certain mortgage-related matters, and agreements the firm has entered into to toll the statute of limitations.

**Certain Mortgage-Related Contingencies.** During the period 2005 through 2008 in connection with both sales and securitizations of loans, the firm provided loan-level representations and/or assigned the loan-level representations from the party from whom the firm purchased the loans.

The firm's exposure to claims for repurchase of residential mortgage loans based on alleged breaches of representations will depend on a number of factors such as the extent to which these claims are made within the statute of limitations, taking into consideration the agreements to toll the statute of limitations the firm entered into with trustees representing certain trusts. Based upon the large number of defaults in residential mortgages, including those sold or securitized by the firm, there is a potential for repurchase claims. However, the firm is not in a position to make a meaningful estimate of that exposure at this time.

**Other Contingencies.** In connection with the sale of Metro International Trade Services (Metro), the firm agreed to provide indemnities to the buyer, which primarily relate to fundamental representations and warranties, and potential liabilities for legal or regulatory proceedings arising out of the conduct of Metro's business while the firm owned it.

In connection with the settlement agreement with the Residential Mortgage-Backed Securities Working Group of the U.S. Financial Fraud Enforcement Task Force, the firm agreed to provide $1.80 billion in consumer relief by January 2021. As of December 2018, approximately $1.20 billion of such relief was provided. This relief was provided in the form of principal forgiveness for underwater homeowners and distressed borrowers; financing for construction, rehabilitation and preservation of affordable housing; and support for debt restructuring, foreclosure prevention and housing quality improvement programs, as well as land banks.

### Guarantees

The table below presents derivatives that meet the definition of a guarantee, securities lending indemnifications and certain other financial guarantees.

| *$ in millions* | Derivatives | Securities lending indemnifications | Other financial guarantees |
|---|---|---|---|
| **As of December 2018** | | | |
| **Carrying Value of Net Liability** | **$ 4,105** | **$ –** | **$ 38** |
| **Maximum Payout/Notional Amount by Period of Expiration** | | | |
| 2019 | **$101,169** | **$27,869** | **$1,379** |
| 2020 - 2021 | **77,955** | **–** | **2,252** |
| 2022 - 2023 | **17,813** | **–** | **2,021** |
| 2024 - thereafter | **67,613** | **–** | **241** |
| **Total** | **$264,550** | **$27,869** | **$5,893** |
| As of December 2017 | | | |
| Carrying Value of Net Liability | $ 3,843 | $ – | $ 37 |
| **Maximum Payout/Notional Amount by Period of Expiration** | | | |
| 2018 | $113,766 | $37,959 | $ 723 |
| 2019 - 2020 | 59,314 | – | 1,515 |
| 2021 - 2022 | 24,712 | – | 1,209 |
| 2023 - thereafter | 45,343 | – | 137 |
| Total | $243,135 | $37,959 | $3,584 |

In the table above:

- The maximum payout is based on the notional amount of the contract and does not represent anticipated losses.
- Amounts exclude certain commitments to issue standby letters of credit that are included in lending commitments. See the tables in "Commitments" above for a summary of the firm's commitments.
- The carrying value for derivatives included derivative assets of $1.48 billion as of December 2018 and $1.33 billion as of December 2017, and derivative liabilities of $5.59 billion as of December 2018 and $5.17 billion as of December 2017.

**Derivative Guarantees.** The firm enters into various derivatives that meet the definition of a guarantee under U.S. GAAP, including written equity and commodity put options, written currency contracts and interest rate caps, floors and swaptions. These derivatives are risk managed together with derivatives that do not meet the definition of a guarantee, and therefore the amounts in the table above do not reflect the firm's overall risk related to derivative activities. Disclosures about derivatives are not required if they may be cash settled and the firm has no basis to conclude it is probable that the counterparties held the underlying instruments at inception of the contract. The firm has concluded that these conditions have been met for certain large, internationally active commercial and investment bank counterparties, central clearing counterparties and certain other counterparties. Accordingly, the firm has not included such contracts in the table above. In addition, during 2018, the firm concluded that these conditions have also been met for hedge fund counterparties and, therefore, has not included contracts with these counterparties in the table above. Prior periods have been conformed to the current presentation. See Note 7 for information about credit derivatives that meet the definition of a guarantee, which are not included in the table above.

Derivatives are accounted for at fair value and therefore the carrying value is considered the best indication of payment/performance risk for individual contracts. However, the carrying values in the table above exclude the effect of counterparty and cash collateral netting.

**Securities Lending Indemnifications.** The firm, in its capacity as an agency lender, indemnifies most of its securities lending customers against losses incurred in the event that borrowers do not return securities and the collateral held is insufficient to cover the market value of the securities borrowed. Collateral held by the lenders in connection with securities lending indemnifications was $28.75 billion as of December 2018 and $39.03 billion as of December 2017. Because the contractual nature of these arrangements requires the firm to obtain collateral with a market value that exceeds the value of the securities lent to the borrower, there is minimal performance risk associated with these guarantees.

**Other Financial Guarantees.** In the ordinary course of business, the firm provides other financial guarantees of the obligations of third parties (e.g., standby letters of credit and other guarantees to enable clients to complete transactions and fund-related guarantees). These guarantees represent obligations to make payments to beneficiaries if the guaranteed party fails to fulfill its obligation under a contractual arrangement with that beneficiary.

**Guarantees of Securities Issued by Trusts.** The firm has established trusts, including Goldman Sachs Capital I, the APEX Trusts and other entities for the limited purpose of issuing securities to third parties, lending the proceeds to the firm and entering into contractual arrangements with the firm and third parties related to this purpose. The firm does not consolidate these entities. See Note 16 for further information about the transactions involving Goldman Sachs Capital I and the APEX Trusts.

The firm effectively provides for the full and unconditional guarantee of the securities issued by these entities. Timely payment by the firm of amounts due to these entities under the guarantee, borrowing, preferred stock and related contractual arrangements will be sufficient to cover payments due on the securities issued by these entities.

Management believes that it is unlikely that any circumstances will occur, such as nonperformance on the part of paying agents or other service providers, that would make it necessary for the firm to make payments related to these entities other than those required under the terms of the guarantee, borrowing, preferred stock and related contractual arrangements and in connection with certain expenses incurred by these entities.

**Indemnities and Guarantees of Service Providers.** In the ordinary course of business, the firm indemnifies and guarantees certain service providers, such as clearing and custody agents, trustees and administrators, against specified potential losses in connection with their acting as an agent of, or providing services to, the firm or its affiliates.

The firm may also be liable to some clients or other parties for losses arising from its custodial role or caused by acts or omissions of third-party service providers, including sub-custodians and third-party brokers. In certain cases, the firm has the right to seek indemnification from these third-party service providers for certain relevant losses incurred by the firm. In addition, the firm is a member of payment, clearing and settlement networks, as well as securities exchanges around the world that may require the firm to meet the obligations of such networks and exchanges in the event of member defaults and other loss scenarios.

In connection with the firm's prime brokerage and clearing businesses, the firm agrees to clear and settle on behalf of its clients the transactions entered into by them with other brokerage firms. The firm's obligations in respect of such transactions are secured by the assets in the client's account, as well as any proceeds received from the transactions cleared and settled by the firm on behalf of the client. In connection with joint venture investments, the firm may issue loan guarantees under which it may be liable in the event of fraud, misappropriation, environmental liabilities and certain other matters involving the borrower.

The firm is unable to develop an estimate of the maximum payout under these guarantees and indemnifications. However, management believes that it is unlikely the firm will have to make any material payments under these arrangements, and no material liabilities related to these guarantees and indemnifications have been recognized in the consolidated statements of financial condition as of both December 2018 and December 2017.

**Other Representations, Warranties and Indemnifications.** The firm provides representations and warranties to counterparties in connection with a variety of commercial transactions and occasionally indemnifies them against potential losses caused by the breach of those representations and warranties. The firm may also provide indemnifications protecting against changes in or adverse application of certain U.S. tax laws in connection with ordinary-course transactions such as securities issuances, borrowings or derivatives.

In addition, the firm may provide indemnifications to some counterparties to protect them in the event additional taxes are owed or payments are withheld, due either to a change in or an adverse application of certain non-U.S. tax laws.

These indemnifications generally are standard contractual terms and are entered into in the ordinary course of business. Generally, there are no stated or notional amounts included in these indemnifications, and the contingencies triggering the obligation to indemnify are not expected to occur. The firm is unable to develop an estimate of the maximum payout under these guarantees and indemnifications. However, management believes that it is unlikely the firm will have to make any material payments under these arrangements, and no material liabilities related to these arrangements have been recognized in the consolidated statements of financial condition as of both December 2018 and December 2017.

**Guarantees of Subsidiaries.** Group Inc. fully and unconditionally guarantees the securities issued by GS Finance Corp., a wholly-owned finance subsidiary of the firm. Group Inc. has guaranteed the payment obligations of Goldman Sachs & Co. LLC (GS&Co.) and GS Bank USA, subject to certain exceptions.

Group Inc. guarantees many of the obligations of its other consolidated subsidiaries on a transaction-by-transaction basis, as negotiated with counterparties. Group Inc. is unable to develop an estimate of the maximum payout under its subsidiary guarantees; however, because these obligations are also obligations of consolidated subsidiaries, Group Inc.'s liabilities as guarantor are not separately disclosed.

## Note 19.
## Shareholders' Equity

### Common Equity

As of both December 2018 and December 2017, the firm had 4.00 billion authorized shares of common stock and 200 million authorized shares of nonvoting common stock, each with a par value of $0.01 per share.

The firm's share repurchase program is intended to help maintain the appropriate level of common equity. The share repurchase program is effected primarily through regular open-market purchases (which may include repurchase plans designed to comply with Rule 10b5-1), the amounts and timing of which are determined primarily by the firm's current and projected capital position, and capital deployment opportunities, but which may also be influenced by general market conditions and the prevailing price and trading volumes of the firm's common stock. Prior to repurchasing common stock, the firm must receive confirmation that the FRB does not object to such capital action.

The table below presents the amount of common stock repurchased under the share repurchase program.

| | Year Ended December | | |
|---|---|---|---|
| *in millions, except per share amounts* | **2018** | 2017 | 2016 |
| Common share repurchases | **13.9** | 29.0 | 36.6 |
| Average cost per share | **$236.22** | $231.87 | $165.88 |
| Total cost of common share repurchases | **$ 3,294** | $ 6,721 | $ 6,069 |

Pursuant to the terms of certain share-based compensation plans, employees may remit shares to the firm or the firm may cancel share-based awards to satisfy statutory employee tax withholding requirements and the exercise price of stock options. Under these plans, 1,120 shares in 2018, 12,165 shares in 2017, and 49,374 shares in 2016 were remitted with a total value of $0.3 million in 2018, $3 million in 2017 and $7 million in 2016, and the firm cancelled 5.0 million share-based awards in 2018, 12.7 million in 2017 and 11.6 million in 2016 with a total value of $1.24 billion in 2018, $3.03 billion in 2017 and $2.03 billion in 2016.

The table below presents common stock dividends declared.

| | Year Ended December | | |
|---|---|---|---|
| | **2018** | 2017 | 2016 |
| Dividends declared per common share | **$ 3.15** | $ 2.90 | $ 2.60 |

On January 15, 2019, the Board of Directors of Group Inc. (Board) declared a dividend of $0.80 per common share to be paid on March 28, 2019 to common shareholders of record on February 28, 2019.

## Preferred Equity

The tables below present information about the perpetual preferred stock issued and outstanding as of December 2018.

| Series | Shares Authorized | Shares Issued | Shares Outstanding | Depositary Shares Per Share |
|---|---|---|---|---|
| A | 50,000 | 30,000 | 29,999 | 1,000 |
| B | 50,000 | 6,000 | 6,000 | 1,000 |
| C | 25,000 | 8,000 | 8,000 | 1,000 |
| D | 60,000 | 54,000 | 53,999 | 1,000 |
| E | 17,500 | 7,667 | 7,667 | N/A |
| F | 5,000 | 1,615 | 1,615 | N/A |
| J | 46,000 | 40,000 | 40,000 | 1,000 |
| K | 32,200 | 28,000 | 28,000 | 1,000 |
| L | 52,000 | 52,000 | 52,000 | 25 |
| M | 80,000 | 80,000 | 80,000 | 25 |
| N | 31,050 | 27,000 | 27,000 | 1,000 |
| O | 26,000 | 26,000 | 26,000 | 25 |
| P | 66,000 | 60,000 | 60,000 | 25 |
| **Total** | **540,750** | **420,282** | **420,280** | |

| Series | Earliest Redemption Date | Liquidation Preference | Redemption Value (*$ in millions*) |
|---|---|---|---|
| A | Currently redeemable | $ 25,000 | **$ 750** |
| B | Currently redeemable | $ 25,000 | **150** |
| C | Currently redeemable | $ 25,000 | **200** |
| D | Currently redeemable | $ 25,000 | **1,350** |
| E | Currently redeemable | $100,000 | **767** |
| F | Currently redeemable | $100,000 | **161** |
| J | May 10, 2023 | $ 25,000 | **1,000** |
| K | May 10, 2024 | $ 25,000 | **700** |
| L | May 10, 2019 | $ 25,000 | **1,300** |
| M | May 10, 2020 | $ 25,000 | **2,000** |
| N | May 10, 2021 | $ 25,000 | **675** |
| O | November 10, 2026 | $ 25,000 | **650** |
| P | November 10, 2022 | $ 25,000 | **1,500** |
| **Total** | | | **$11,203** |

In the tables above:

- All shares have a par value of $0.01 per share and, where applicable, each share is represented by the specified number of depositary shares.
- The earliest redemption date represents the date on which each share of non-cumulative Preferred Stock is redeemable at the firm's option.
- Prior to redeeming preferred stock, the firm must receive confirmation that the FRB does not object to such action.
- The redemption price per share for Series A through F Preferred Stock is the liquidation preference plus declared and unpaid dividends. The redemption price per share for Series J through P Preferred Stock is the liquidation preference plus accrued and unpaid dividends. Each share of non-cumulative Series E and Series F Preferred Stock issued and outstanding is redeemable at the firm's option, subject to certain covenant restrictions governing the firm's ability to redeem the preferred stock without issuing common stock or other instruments with equity-like characteristics. See Note 16 for information about the replacement capital covenants applicable to the Series E and Series F Preferred Stock.
- All series of preferred stock are pari passu and have a preference over the firm's common stock on liquidation.
- The firm's ability to declare or pay dividends on, or purchase, redeem or otherwise acquire, its common stock is subject to certain restrictions in the event that the firm fails to pay or set aside full dividends on the preferred stock for the latest completed dividend period.

In 2018, the firm redeemed 26,000 shares of its outstanding Series B 6.20% Non-Cumulative Preferred Stock (Series B Preferred Stock) with a redemption value of $650 million ($25,000 per share). The difference between the redemption value of the Series B Preferred Stock and the net carrying value at the time of redemption was $15 million, which was recorded as an addition to preferred stock dividends in 2018.

In 2017, the firm redeemed the 34,000 shares of Series I 5.95% Non-Cumulative Preferred Stock (Series I Preferred Stock) for the stated redemption price of $850 million ($25,000 per share), plus accrued and unpaid dividends. The difference between the redemption value of the Series I Preferred Stock and the net carrying value at the time of redemption was $14 million, which was recorded as an addition to preferred stock dividends in 2017.

In 2016, the firm delivered a par amount of $1.32 billion (fair value of $1.04 billion) of APEX to the APEX Trusts in exchange for 9,833 shares of Series E Preferred Stock and 3,385 shares of Series F Preferred Stock for a total redemption value of $1.32 billion (net carrying value of $1.31 billion). Following the exchange, these shares of Series E and Series F Preferred Stock were cancelled. The difference between the fair value of the APEX and the net carrying value of the preferred stock at the time of cancellation was $266 million, which was recorded as a reduction to preferred stock dividends in 2016.

The table below presents the dividend rates of perpetual preferred stock as of December 2018.

| Series | Per Annum Dividend Rate |
|---|---|
| A | 3 month LIBOR + 0.75%, with floor of 3.75%, payable quarterly |
| B | 6.20%, payable quarterly |
| C | 3 month LIBOR + 0.75%, with floor of 4.00%, payable quarterly |
| D | 3 month LIBOR + 0.67%, with floor of 4.00%, payable quarterly |
| E | 3 month LIBOR + 0.77%, with floor of 4.00%, payable quarterly |
| F | 3 month LIBOR + 0.77%, with floor of 4.00%, payable quarterly |
| J | 5.50% to, but excluding, May 10, 2023; 3 month LIBOR + 3.64% thereafter, payable quarterly |
| K | 6.375% to, but excluding, May 10, 2024; 3 month LIBOR + 3.55% thereafter, payable quarterly |
| L | 5.70%, payable semi-annually, from issuance date to, but excluding, May 10, 2019; 3 month LIBOR + 3.884%, payable quarterly, thereafter |
| M | 5.375%, payable semi-annually, from issuance date to, but excluding, May 10, 2020; 3 month LIBOR + 3.922%, payable quarterly, thereafter |
| N | 6.30%, payable quarterly |
| O | 5.30%, payable semi-annually, from issuance date to, but excluding, November 10, 2026; 3 month LIBOR + 3.834%, payable quarterly, thereafter |
| P | 5.00%, payable semi-annually, from issuance date to, but excluding, November 10, 2022; 3 month LIBOR + 2.874%, payable quarterly, thereafter |

In the table above, dividends on each series of preferred stock are payable in arrears for the periods specified.

The table below presents preferred stock dividends declared.

| | Year Ended December | | | | | |
|---|---|---|---|---|---|---|
| | **2018** | | 2017 | | 2016 | |
| **Series** | ***per share*** | ***$ in millions*** | *per share* | *$ in millions* | *per share* | *$ in millions* |
| A | **$ 958.33** | **$ 29** | $ 950.51 | $ 29 | $ 953.12 | $ 29 |
| B | **$1,550.00** | **19** | $1,550.00 | 50 | $1,550.00 | 50 |
| C | **$1,022.23** | **8** | $1,013.90 | 8 | $1,016.68 | 8 |
| D | **$1,022.23** | **55** | $1,013.90 | 55 | $1,016.68 | 55 |
| E | **$4,077.78** | **31** | $4,055.55 | 31 | $4,066.66 | 50 |
| F | **$4,077.78** | **7** | $4,055.55 | 6 | $4,066.66 | 13 |
| I | **$ –** | **–** | $1,487.52 | 51 | $1,487.52 | 51 |
| J | **$1,375.00** | **55** | $1,375.00 | 55 | $1,375.00 | 55 |
| K | **$1,593.76** | **45** | $1,593.76 | 45 | $1,593.76 | 45 |
| L | **$1,425.00** | **74** | $1,425.00 | 74 | $1,425.00 | 74 |
| M | **$1,343.76** | **107** | $1,343.76 | 107 | $1,343.76 | 107 |
| N | **$1,575.00** | **43** | $1,575.00 | 42 | $1,124.38 | 30 |
| O | **$1,325.00** | **34** | $1,325.00 | 34 | $ 379.10 | 10 |
| P | **$1,281.25** | **77** | $ – | – | $ – | – |
| **Total** | | **$584** | | $587 | | $577 |

In the table above, the total preferred dividend amounts for Series E and Series F Preferred Stock for 2016 include prorated dividends of $866.67 per share related to 4,861 shares of Series E Preferred Stock and 1,639 shares of Series F Preferred Stock, which were cancelled during 2016.

On January 7, 2019, Group Inc. declared dividends of $234.38 per share of Series A Preferred Stock, $387.50 per share of Series B Preferred Stock, $250.00 per share of Series C Preferred Stock, $250.00 per share of Series D Preferred Stock, $343.75 per share of Series J Preferred Stock, $398.44 per share of Series K Preferred Stock and $393.75 per share of Series N Preferred Stock to be paid on February 11, 2019 to preferred shareholders of record on January 27, 2019. In addition, the firm declared dividends of $977.78 per each share of Series E Preferred Stock and Series F Preferred Stock, to be paid on March 1, 2019 to preferred shareholders of record on February 14, 2019.

### Accumulated Other Comprehensive Income/(Loss)

The table below presents changes in the accumulated other comprehensive income/(loss), net of tax, by type.

| *$ in millions* | Beginning balance | Other comprehensive income/(loss) adjustments, net of tax | Ending balance |
|---|---|---|---|
| **Year Ended December 2018** | | | |
| Currency translation | **$ (625)** | **$ 4** | **$ (621)** |
| Debt valuation adjustment | **(1,046)** | **2,553** | **1,507** |
| Pension and postretirement liabilities | **(200)** | **119** | **(81)** |
| Available-for-sale securities | **(9)** | **(103)** | **(112)** |
| **Total** | **$(1,880)** | **$2,573** | **$ 693** |
| Year Ended December 2017 | | | |
| Currency translation | $ (647) | $ 22 | $ (625) |
| Debt valuation adjustment | (239) | (807) | (1,046) |
| Pension and postretirement liabilities | (330) | 130 | (200) |
| Available-for-sale securities | – | (9) | (9) |
| Total | $(1,216) | $ (664) | $(1,880) |
| Year Ended December 2016 | | | |
| Currency translation | $ (587) | $ (60) | $ (647) |
| Debt valuation adjustment | 305 | (544) | (239) |
| Pension and postretirement liabilities | (131) | (199) | (330) |
| Total | $ (413) | $ (803) | $(1,216) |

**Note 20.**

## Regulation and Capital Adequacy

The FRB is the primary regulator of Group Inc., a bank holding company (BHC) under the U.S. Bank Holding Company Act of 1956 and a financial holding company under amendments to this Act. As a BHC, the firm is subject to consolidated regulatory capital requirements which are calculated in accordance with the regulations of the FRB (Capital Framework).

The capital requirements are expressed as risk-based capital and leverage ratios that compare measures of regulatory capital to risk-weighted assets (RWAs), average assets and off-balance-sheet exposures. Failure to comply with these capital requirements could result in restrictions being imposed by the firm's regulators and could limit the firm's ability to distribute capital, including share repurchases and dividend payments, and to make certain discretionary compensation payments. The firm's capital levels are also subject to qualitative judgments by the regulators about components of capital, risk weightings and other factors. Furthermore, certain of the firm's subsidiaries are subject to separate regulations and capital requirements.

### Capital Framework

The regulations under the Capital Framework are largely based on the Basel Committee on Banking Supervision's (Basel Committee) capital framework for strengthening international capital standards (Basel III) and also implement certain provisions of the Dodd-Frank Act. Under the Capital Framework, the firm is an "Advanced approach" banking organization and has been designated as a global systemically important bank (G-SIB).

The Capital Framework includes risk-based capital buffers which began to phase in ratably on January 1, 2016, and became fully effective on January 1, 2019. The risk-based capital buffers include the capital conservation buffer, G-SIB buffer and countercyclical capital buffer, if any, all of which must consist entirely of capital that qualifies as Common Equity Tier 1 (CET1). The G-SIB buffer is an extension of the capital conservation buffer, is updated annually based on financial data from the prior year and is generally applicable for the following year. The countercyclical capital buffer is also an extension of the capital conservation buffer and is intended to counteract systemic vulnerabilities. The Capital Framework also requires deductions from regulatory capital that phased in ratably per year from 2014 to 2018. In addition, junior subordinated debt issued to trusts will be fully phased out of regulatory capital by 2022.

The firm calculates its CET1, Tier 1 capital and Total capital ratios in accordance with (i) the Standardized approach and market risk rules set out in the Capital Framework (together, the Standardized Capital Rules) and (ii) the Advanced approach and market risk rules set out in the Capital Framework (together, the Basel III Advanced Rules). The lower of each risk-based capital ratio calculated in (i) and (ii) is the ratio against which the firm's compliance with its minimum risk-based ratio requirements is assessed. Under the Capital Framework, the firm is also subject to Tier 1 leverage requirements established by the FRB. The Capital Framework also introduced a supplementary leverage ratio (SLR) which became effective on January 1, 2018.

### Consolidated Regulatory Risk-Based Capital and Leverage Ratios

The table below presents the minimum risk-based capital and leverage ratios.

| | As of December | |
|---|---|---|
| | **2018** | 2017 |
| **Risk-based capital ratios** | | |
| CET1 ratio | **8.3%** | 7.0% |
| Tier 1 capital ratio | **9.8%** | 8.5% |
| Total capital ratio | **11.8%** | 10.5% |
| **Leverage ratios** | | |
| Tier 1 leverage ratio | **4.0%** | 4.0% |
| SLR | **5.0%** | N/A |

The table below presents information about the risk-based capital ratios.

| *$ in millions* | Standardized | Basel III Advanced |
|---|---|---|
| **As of December 2018** | | |
| CET1 | **$ 73,116** | **$ 73,116** |
| Tier 1 capital | **$ 83,702** | **$ 83,702** |
| Tier 2 capital | **$ 14,926** | **$ 13,743** |
| Total capital | **$ 98,628** | **$ 97,445** |
| RWAs | **$547,910** | **$558,111** |
| CET1 ratio | **13.3%** | **13.1%** |
| Tier 1 capital ratio | **15.3%** | **15.0%** |
| Total capital ratio | **18.0%** | **17.5%** |
| As of December 2017 | | |
| CET1 | $ 67,110 | $ 67,110 |
| Tier 1 capital | $ 78,331 | $ 78,331 |
| Tier 2 capital | $ 14,977 | $ 13,899 |
| Total capital | $ 93,308 | $ 92,230 |
| RWAs | $555,611 | $617,646 |
| CET1 ratio | 12.1% | 10.9% |
| Tier 1 capital ratio | 14.1% | 12.7% |
| Total capital ratio | 16.8% | 14.9% |

The table below presents information about the leverage ratios.

| | For the Three Months Ended or as of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Tier 1 capital** | **$ 83,702** | $ 78,331 |
| Average total assets | **945,961** | 937,424 |
| Deductions from Tier 1 capital | **(4,754)** | (4,508) |
| Average adjusted total assets | **941,207** | 932,916 |
| Off-balance-sheet exposures | **401,699** | 408,164 |
| **Total leverage exposure** | **$1,342,906** | $1,341,080 |
| **Tier 1 leverage ratio** | **8.9%** | 8.4% |
| **SLR** | **6.2%** | 5.8% |

In the tables above:

- Each of the risk-based capital ratios calculated in accordance with the Basel III Advanced Rules was lower than that calculated in accordance with the Standardized Capital Rules and therefore the Basel III Advanced ratios were the ratios that applied to the firm as of both December 2018 and December 2017.
- Effective January 2018, the firm became subject to CET1 ratios calculated on a fully phased-in basis. As of December 2017, the firm's CET1 ratios calculated in accordance with the Standardized Capital Rules and Basel III Advanced Rules on a fully phased-in basis were 0.2 percentage points lower than on a transitional basis.
- Beginning in the fourth quarter of 2018, the firm's default experience was incorporated into the determination of probability of default for the calculation of Basel III Advanced RWAs. The impact of this change was an increase in the firm's Basel III Advanced CET1 ratio of approximately 0.8 percentage points.
- The minimum risk-based capital ratios as of December 2018 reflect (i) the 75% phase-in of the capital conservation buffer of 2.5%, (ii) the 75% phase-in of the G-SIB buffer of 2.5%, and (iii) the countercyclical capital buffer, which the FRB has set to zero.
- The minimum risk-based capital ratios as of December 2017 reflect (i) the 50% phase-in of the capital conservation buffer of 2.5%, (ii) the 50% phase-in of the G-SIB buffer of 2.5%, and (iii) the countercyclical capital buffer, which the FRB has set to zero.
- The minimum SLR as of December 2018 reflects the 2% buffer applicable to G-SIBs.
- Tier 1 capital and deductions from Tier 1 capital are calculated on a transitional basis as of December 2017.
- Average total assets represents the daily average assets for the quarter.
- Off-balance-sheet exposures represents the monthly average and consists of derivatives, securities financing transactions, commitments and guarantees.
- Tier 1 leverage ratio is calculated as Tier 1 capital divided by average adjusted total assets.
- SLR is calculated as Tier 1 capital divided by total leverage exposure.

**Risk-based Capital.** The table below presents information about risk-based capital.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Common shareholders' equity | **$78,982** | $70,390 |
| Deduction for goodwill | **(3,097)** | (3,011) |
| Deduction for identifiable intangible assets | **(297)** | (258) |
| Other adjustments | **(2,472)** | (11) |
| **CET1** | **73,116** | 67,110 |
| Preferred stock | **11,203** | 11,853 |
| Deduction for investments in covered funds | **(615)** | (590) |
| Other adjustments | **(2)** | (42) |
| **Tier 1 capital** | **$83,702** | $78,331 |
| **Standardized Tier 2 and Total capital** | | |
| Tier 1 capital | **$83,702** | $78,331 |
| Qualifying subordinated debt | **13,147** | 13,360 |
| Junior subordinated debt | **442** | 567 |
| Allowance for credit losses | **1,353** | 1,078 |
| Other adjustments | **(16)** | (28) |
| Standardized Tier 2 capital | **14,926** | 14,977 |
| **Standardized Total capital** | **$98,628** | $93,308 |
| **Basel III Advanced Tier 2 and Total capital** | | |
| Tier 1 capital | **$83,702** | $78,331 |
| Standardized Tier 2 capital | **14,926** | 14,977 |
| Allowance for credit losses | **(1,353)** | (1,078) |
| Other adjustments | **170** | – |
| Basel III Advanced Tier 2 capital | **13,743** | 13,899 |
| **Basel III Advanced Total capital** | **$97,445** | $92,230 |

In the table above:

- Deduction for goodwill was net of deferred tax liabilities of $661 million as of December 2018 and $654 million as of December 2017.
- Deduction for identifiable intangible assets was net of deferred tax liabilities of $27 million as of December 2018 and $40 million as of December 2017. The deduction for identifiable intangible assets was fully phased into CET1 in January 2018. As of December 2017, CET1 reflects 80% of the identifiable intangible assets deduction and the remaining 20% was risk weighted.
- Deduction for investments in covered funds represents the firm's aggregate investments in applicable covered funds, excluding investments that are subject to an extended conformance period. See Note 6 for further information about the Volcker Rule.

- Other adjustments within CET1 and Tier 1 capital primarily include credit valuation adjustments on derivative liabilities, pension and postretirement liabilities, the overfunded portion of the firm's defined benefit pension plan obligation net of associated deferred tax liabilities, disallowed deferred tax assets, debt valuation adjustments and other required credit risk-based deductions. The deduction for such items was fully phased into CET1 in January 2018. As of December 2017, CET1 reflects 80% of such deduction. Substantially all of the balance that was not deducted from CET1 as of December 2017 was deducted from Tier 1 capital within other adjustments. Other adjustments within Basel III Advanced Tier 2 capital include eligible credit reserves.

- Qualifying subordinated debt is subordinated debt issued by Group Inc. with an original maturity of five years or greater. The outstanding amount of subordinated debt qualifying for Tier 2 capital is reduced upon reaching a remaining maturity of five years. See Note 16 for further information about the firm's subordinated debt.

- Junior subordinated debt represents debt issued to Trust. As of December 2018, 40% of this debt was included in Tier 2 capital and 60% was fully phased out of regulatory capital. As of December 2017, 50% of this debt was included in Tier 2 capital and 50% was fully phased out of regulatory capital. Junior subordinated debt is reduced by the amount of trust preferred securities purchased by the firm and will be fully phased out of Tier 2 capital by 2022 at a rate of 10% per year. See Note 16 for further information about the firm's junior subordinated debt and trust preferred securities purchased by the firm.

The tables below present changes in CET1, Tier 1 capital and Tier 2 capital.

| | **Year Ended December 2018** | |
|---|---|---|
| *$ in millions* | **Standardized** | **Basel III Advanced** |
| **CET1** | | |
| Beginning balance | **$67,110** | **$67,110** |
| Change in: | | |
| Common shareholders' equity | **8,592** | **8,592** |
| Transitional provisions | **(117)** | **(117)** |
| Deduction for goodwill | **(86)** | **(86)** |
| Deduction for identifiable intangible assets | **26** | **26** |
| Other adjustments | **(2,409)** | **(2,409)** |
| **Ending balance** | **$73,116** | **$73,116** |
| **Tier 1 capital** | | |
| Beginning balance | **$78,331** | **$78,331** |
| Change in: | | |
| CET1 | **6,006** | **6,006** |
| Transitional provisions | **13** | **13** |
| Deduction for investments in covered funds | **(25)** | **(25)** |
| Preferred stock | **(650)** | **(650)** |
| Other adjustments | **27** | **27** |
| Ending balance | **83,702** | **83,702** |
| **Tier 2 capital** | | |
| Beginning balance | **14,977** | **13,899** |
| Change in: | | |
| Qualifying subordinated debt | **(213)** | **(213)** |
| Junior subordinated debt | **(125)** | **(125)** |
| Allowance for credit losses | **275** | **–** |
| Other adjustments | **12** | **182** |
| Ending balance | **14,926** | **13,743** |
| **Total capital** | **$98,628** | **$97,445** |

| | Year Ended December 2017 | |
|---|---|---|
| *$ in millions* | Standardized | Basel III Advanced |
| **CET1** | | |
| Beginning balance | $72,046 | $72,046 |
| Change in: | | |
| Common shareholders' equity | (5,300) | (5,300) |
| Transitional provisions | (426) | (426) |
| Deduction for goodwill | (348) | (348) |
| Deduction for identifiable intangible assets | 24 | 24 |
| Deduction for investments in financial institutions | 586 | 586 |
| Other adjustments | 528 | 528 |
| Ending balance | $67,110 | $67,110 |
| **Tier 1 capital** | | |
| Beginning balance | $82,440 | $82,440 |
| Change in: | | |
| CET1 | (4,936) | (4,936) |
| Transitional provisions | 152 | 152 |
| Deduction for investments in covered funds | (145) | (145) |
| Preferred stock | 650 | 650 |
| Other adjustments | 170 | 170 |
| Ending balance | 78,331 | 78,331 |
| **Tier 2 capital** | | |
| Beginning balance | 16,074 | 15,352 |
| Change in: | | |
| Qualifying subordinated debt | (1,206) | (1,206) |
| Junior subordinated debt | (225) | (225) |
| Allowance for credit losses | 356 | – |
| Other adjustments | (22) | (22) |
| Ending balance | 14,977 | 13,899 |
| Total capital | $93,308 | $92,230 |

In the tables above, the change in transitional provisions represents the increased phase-in of certain deductions and adjustments from 80% to 100% (effective January 1, 2018) for 2018 and from 60% to 80% (effective January 1, 2017) for 2017.

**Risk-Weighted Assets.** RWAs are calculated in accordance with both the Standardized Capital Rules and the Basel III Advanced Rules.

### *Credit Risk*

Credit RWAs are calculated based upon measures of exposure, which are then risk weighted under the Standardized Capital Rules and Basel III Advanced Rules:

- The Standardized Capital Rules apply prescribed risk-weights, which depend largely on the type of counterparty. The exposure measure for derivatives and securities financing transactions are based on specific formulas which take certain factors into consideration.
- Under the Basel III Advanced Rules, the firm computes risk-weights for wholesale and retail credit exposures in accordance with the Advanced Internal Ratings-Based approach. The exposure measures for derivatives and securities financing transactions are computed utilizing internal models.
- For both Standardized and Basel III Advanced credit RWAs, the risk-weights for securitizations and equities are based on specific required formulaic approaches.

### *Market Risk*

RWAs for market risk in accordance with the Standardized Capital Rules and the Basel III Advanced Rules are generally consistent. Market RWAs are calculated based on measures of exposure which include Value-at-Risk (VaR), stressed VaR, incremental risk and comprehensive risk based on internal models, and a standardized measurement method for specific risk.

- VaR is the potential loss in value of inventory positions, as well as certain other financial assets and financial liabilities, due to adverse market movements over a defined time horizon with a specified confidence level.

  For both risk management purposes and regulatory capital calculations the firm uses a single VaR model which captures risks including those related to interest rates, equity prices, currency rates and commodity prices. However, VaR used for regulatory capital requirements (regulatory VaR) differs from risk management VaR due to different time horizons and confidence levels (10-day and 99% for regulatory VaR vs. one-day and 95% for risk management VaR), as well as differences in the scope of positions on which VaR is calculated. In addition, the daily net revenues used to determine risk management VaR exceptions (i.e., comparing the daily net revenues to the VaR measure calculated as of the end of the prior business day) include intraday activity, whereas the FRB's regulatory capital rules require that intraday activity be excluded from daily net revenues when calculating regulatory VaR exceptions. Intraday activity includes bid/offer net revenues, which are more likely than not to be positive by their nature.

  As a result, there may be differences in the number of VaR exceptions and the amount of daily net revenues calculated for regulatory VaR compared to the amounts calculated for risk management VaR. The firm's positional losses observed on a single day exceeded its 99% one-day regulatory VaR on two occasions during 2018 and did not exceed its 99% one-day regulatory VaR during 2017. There was no change in the VaR multiplier used to calculate Market RWAs;
- Stressed VaR is the potential loss in value of inventory positions, as well as certain other financial assets and financial liabilities, during a period of significant market stress;
- Incremental risk is the potential loss in value of non-securitized inventory positions due to the default or credit migration of issuers of financial instruments over a one-year time horizon;
- Comprehensive risk is the potential loss in value, due to price risk and defaults, within the firm's credit correlation positions; and
- Specific risk is the risk of loss on a position that could result from factors other than broad market movements, including event risk, default risk and idiosyncratic risk. The standardized measurement method is used to determine specific risk RWAs, by applying supervisory defined risk-weighting factors after applicable netting is performed.

### *Operational Risk*

Operational RWAs are only required to be included under the Basel III Advanced Rules. The firm utilizes an internal risk-based model to quantify Operational RWAs.

The tables below present information about RWAs.

| | Standardized Capital Rules as of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Credit RWAs** | | |
| Derivatives | **$122,511** | $126,076 |
| Commitments, guarantees and loans | **160,305** | 145,104 |
| Securities financing transactions | **66,363** | 77,962 |
| Equity investments | **53,563** | 48,155 |
| Other | **70,596** | 70,933 |
| **Total Credit RWAs** | **473,338** | 468,230 |
| **Market RWAs** | | |
| Regulatory VaR | **7,782** | 7,532 |
| Stressed VaR | **27,952** | 32,753 |
| Incremental risk | **10,469** | 8,441 |
| Comprehensive risk | **2,770** | 2,397 |
| Specific risk | **25,599** | 36,258 |
| **Total Market RWAs** | **74,572** | 87,381 |
| **Total RWAs** | **$547,910** | $555,611 |

| $ in millions | Basel III Advanced Rules as of December 2018 | 2017 |
|---|---|---|
| **Credit RWAs** | | |
| Derivatives | **$ 82,301** | $102,986 |
| Commitments, guarantees and loans | **143,356** | 163,375 |
| Securities financing transactions | **18,259** | 19,362 |
| Equity investments | **55,154** | 51,626 |
| Other | **69,681** | 75,968 |
| **Total Credit RWAs** | **368,751** | 413,317 |
| **Market RWAs** | | |
| Regulatory VaR | **7,782** | 7,532 |
| Stressed VaR | **27,952** | 32,753 |
| Incremental risk | **10,469** | 8,441 |
| Comprehensive risk | **2,770** | 1,870 |
| Specific risk | **25,599** | 36,258 |
| **Total Market RWAs** | **74,572** | 86,854 |
| **Total Operational RWAs** | **114,788** | 117,475 |
| **Total RWAs** | **$558,111** | $617,646 |

In the tables above:

- Securities financing transactions represent resale and repurchase agreements and securities borrowed and loaned transactions.
- Other includes receivables, certain debt securities, cash and cash equivalents and other assets.

The tables below present changes in RWAs.

| $ in millions | Year Ended December 2018 Standardized | Basel III Advanced |
|---|---|---|
| **Risk-Weighted Assets** | | |
| Beginning balance | **$555,611** | **$617,646** |
| **Credit RWAs** | | |
| Change in: | | |
| Transitional provisions | **7,766** | **8,232** |
| Derivatives | **(3,565)** | **(20,685)** |
| Commitments, guarantees and loans | **15,201** | **(20,019)** |
| Securities financing transactions | **(11,599)** | **(1,103)** |
| Equity investments | **(2,241)** | **(4,580)** |
| Other | **(454)** | **(6,411)** |
| **Change in Credit RWAs** | **5,108** | **(44,566)** |
| **Market RWAs** | | |
| Change in: | | |
| Regulatory VaR | **250** | **250** |
| Stressed VaR | **(4,801)** | **(4,801)** |
| Incremental risk | **2,028** | **2,028** |
| Comprehensive risk | **373** | **900** |
| Specific risk | **(10,659)** | **(10,659)** |
| **Change in Market RWAs** | **(12,809)** | **(12,282)** |
| **Operational RWAs** | | |
| Change in operational risk | **–** | **(2,687)** |
| **Change in Operational RWAs** | **–** | **(2,687)** |
| **Ending balance** | **$547,910** | **$558,111** |

| $ in millions | Year Ended December 2017 Standardized | Basel III Advanced |
|---|---|---|
| **Risk-Weighted Assets** | | |
| Beginning balance | $496,676 | $549,650 |
| **Credit RWAs** | | |
| Change in: | | |
| Transitional provisions | (233) | (233) |
| Derivatives | 1,790 | (2,110) |
| Commitments, guarantees and loans | 29,360 | 40,583 |
| Securities financing transactions | 6,643 | 4,689 |
| Equity investments | 6,889 | 7,693 |
| Other | 12,368 | 12,608 |
| Change in Credit RWAs | 56,817 | 63,230 |
| **Market RWAs** | | |
| Change in: | | |
| Regulatory VaR | (2,218) | (2,218) |
| Stressed VaR | 10,278 | 10,278 |
| Incremental risk | 566 | 566 |
| Comprehensive risk | (2,941) | (2,680) |
| Specific risk | (3,567) | (3,567) |
| Change in Market RWAs | 2,118 | 2,379 |
| **Operational RWAs** | | |
| Change in operational risk | – | 2,387 |
| Change in Operational RWAs | – | 2,387 |
| Ending balance | $555,611 | $617,646 |

## RWAs Rollforward Commentary

**Year Ended December 2018.** Standardized Credit RWAs as of December 2018 increased by $5.11 billion compared with December 2017, primarily reflecting an increase in commitments, guarantees and loans, principally due to an increase in lending activity. This increase was partially offset by a decrease in securities financing transactions, principally due to reduced exposures. Standardized Market RWAs as of December 2018 decreased by $12.81 billion compared with December 2017, primarily reflecting a decrease in specific risk on positions for which the firm obtained increased transparency into the underliers and as a result utilized a modeled approach to calculate RWAs.

Basel III Advanced Credit RWAs as of December 2018 decreased by $44.57 billion compared with December 2017. Beginning in the fourth quarter of 2018, the firm's default experience was incorporated into the determination of probability of default, which resulted in a decrease in Credit RWAs, primarily in commitments, guarantees and loans and derivatives. Basel III Advanced Market RWAs as of December 2018 decreased by $12.28 billion compared with December 2017, primarily reflecting a decrease in specific risk on positions for which the firm obtained increased transparency into the underliers and as a result utilized a modeled approach to calculate RWAs.

**Year Ended December 2017.** Standardized Credit RWAs as of December 2017 increased by $56.82 billion compared with December 2016, primarily reflecting an increase in commitments, guarantees and loans, principally due to increased lending activity. Standardized Market RWAs as of December 2017 increased by $2.12 billion compared with December 2016, primarily reflecting an increase in stressed VaR as a result of increased risk exposures partially offset by decreases in specific risk, as a result of changes in risk exposures, and comprehensive risk, as a result of changes in risk measurements.

Basel III Advanced Credit RWAs as of December 2017 increased by $63.23 billion compared with December 2016, primarily reflecting an increase in commitments, guarantees and loans, principally due to increased lending activity. Basel III Advanced Market RWAs as of December 2017 increased by $2.38 billion compared with December 2016, primarily reflecting an increase in stressed VaR as a result of increased risk exposures partially offset by decreases in specific risk, as a result of changes in risk exposures, and comprehensive risk, as a result of changes in risk measurements.

### Bank Subsidiaries

**Regulatory Capital Ratios.** GS Bank USA, an FDIC-insured, New York State-chartered bank and a member of the Federal Reserve System, is supervised and regulated by the FRB, the FDIC, the New York State Department of Financial Services and the Bureau of Consumer Financial Protection, and is subject to regulatory capital requirements that are calculated in substantially the same manner as those applicable to BHCs. For purposes of assessing the adequacy of its capital, GS Bank USA calculates its capital ratios in accordance with the regulatory capital requirements applicable to state member banks. Those requirements are based on the Capital Framework described above. GS Bank USA is an Advanced approach banking organization under the Capital Framework.

Under the regulatory framework for prompt corrective action applicable to GS Bank USA, in order to meet the quantitative requirements for being a "well-capitalized" depository institution, GS Bank USA must meet higher minimum requirements than the minimum ratios in the table below. In order to be considered a "well-capitalized" depository institution, GS Bank USA must meet the SLR requirement of 6.0% or greater, which became effective on January 1, 2018.

GS Bank USA's capital levels and prompt corrective action classification are also subject to qualitative judgments by the regulators about components of capital, risk weightings and other factors. Failure to comply with these capital requirements, including a breach of the buffers described above, could result in restrictions being imposed by GS Bank USA's regulators.

Similar to the firm, GS Bank USA is required to calculate each of the CET1, Tier 1 capital and Total capital ratios in accordance with both the Standardized Capital Rules and Basel III Advanced Rules. The lower of each risk-based capital ratio calculated in accordance with the Standardized Capital Rules and Basel III Advanced Rules is the ratio against which GS Bank USA's compliance with its minimum ratio requirements is assessed.

The table below presents GS Bank USA's minimum risk-based capital and leverage ratios and "well-capitalized" minimum ratios.

| | Minimum Ratio as of December | | "Well-capitalized" |
|---|---|---|---|
| | **2018** | 2017 | **Minimum Ratio** |
| **Risk-based capital ratios** | | | |
| CET1 ratio | **6.4%** | 5.8% | **6.5%** |
| Tier 1 capital ratio | **7.9%** | 7.3% | **8.0%** |
| Total capital ratio | **9.9%** | 9.3% | **10.0%** |
| **Leverage ratios** | | | |
| Tier 1 leverage ratio | **4.0%** | 4.0% | **5.0%** |
| SLR | **3.0%** | N/A | **6.0%** |

The table below presents information about GS Bank USA's risk-based capital ratios.

| *$ in millions* | Standardized | Basel III Advanced |
|---|---|---|
| **As of December 2018** | | |
| CET1 | **$ 27,467** | **$ 27,467** |
| Tier 1 capital | **$ 27,467** | **$ 27,467** |
| Tier 2 capital | **$ 5,069** | **$ 4,446** |
| Total capital | **$ 32,536** | **$ 31,913** |
| RWAs | **$248,356** | **$149,019** |
| CET1 ratio | **11.1%** | **18.4%** |
| Tier 1 capital ratio | **11.1%** | **18.4%** |
| Total capital ratio | **13.1%** | **21.4%** |
| As of December 2017 | | |
| CET1 | $ 25,343 | $ 25,343 |
| Tier 1 capital | $ 25,343 | $ 25,343 |
| Tier 2 capital | $ 2,547 | $ 2,000 |
| Total capital | $ 27,890 | $ 27,343 |
| RWAs | $229,775 | $164,602 |
| CET1 ratio | 11.0% | 15.4% |
| Tier 1 capital ratio | 11.0% | 15.4% |
| Total capital ratio | 12.1% | 16.6% |

The table below presents information about GS Bank USA's leverage ratios.

| | For the Three Months Ended or as of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Tier 1 capital | **$ 27,467** | $ 25,343 |
| Average adjusted total assets | **$188,606** | $168,842 |
| Total leverage exposure | **$368,062** | $345,734 |
| Tier 1 leverage ratio | **14.6%** | 15.0% |
| SLR | **7.5%** | 7.3% |

In the tables above:

- Each of the risk-based capital ratios calculated in accordance with the Standardized Capital Rules was lower than that calculated in accordance with the Basel III Advanced Rules and therefore the Standardized Capital ratios were the ratios that applied to GS Bank USA as of both December 2018 and December 2017.
- The minimum risk-based capital ratios as of December 2018 reflect (i) the 75% phase-in of the capital conservation buffer of 2.5% and (ii) the countercyclical capital buffer of zero percent.
- The minimum risk-based capital ratios as of December 2017 reflect (i) the 50% phase-in of the capital conservation buffer of 2.5% and (ii) the countercyclical capital buffer of zero percent.
- Beginning in the fourth quarter of 2018, the firm's default experience was incorporated into the determination of probability of default for the calculation of Basel III Advanced RWAs. The impact of this change was an increase in GS Bank USA's Basel III Advanced CET1 ratio of approximately 1.6 percentage points.
- The Standardized CET1 ratio and Tier 1 capital ratio both remained essentially unchanged from December 2017 to December 2018.
- The Standardized Total capital ratio increased from December 2017 to December 2018 primarily due to an increase in Total capital, principally due to the issuance of subordinated debt.
- The Basel III Advanced CET1 ratio, Tier 1 capital ratio and Total capital ratio increased from December 2017 to December 2018. Beginning in the fourth quarter of 2018, the firm's default experience was incorporated into the determination of probability of default, which resulted in a decrease in Credit RWAs, primarily in commitments, guarantees and loans and derivatives.
- Tier 1 capital and deductions from Tier 1 capital are calculated on a transitional basis as of December 2017.
- Tier 1 leverage ratio is calculated as Tier 1 capital divided by average adjusted total assets.
- SLR is calculated as Tier 1 capital divided by total leverage exposure.

The firm's principal non-U.S. bank subsidiary, GSIB, is a wholly-owned credit institution, regulated by the Prudential Regulation Authority and the Financial Conduct Authority and is subject to minimum capital requirements. As of both December 2018 and December 2017, GSIB was in compliance with all regulatory capital requirements.

**Other.** The deposits of GS Bank USA are insured by the FDIC to the extent provided by law. The FRB requires that GS Bank USA maintain cash reserves with the Federal Reserve Bank of New York. The amount deposited by GS Bank USA at the Federal Reserve Bank of New York was $29.20 billion as of December 2018 and $50.86 billion as of December 2017, which exceeded required reserve amounts by $29.03 billion as of December 2018 and $50.74 billion as of December 2017.

### Restrictions on Payments

Group Inc. may be limited in its ability to access capital held at certain subsidiaries as a result of regulatory, tax or other constraints. These limitations include provisions of applicable law and regulations and other regulatory restrictions that limit the ability of those subsidiaries to declare and pay dividends without prior regulatory approval (e.g., dividends that may be paid by GS Bank USA are limited to the lesser of the amounts calculated under a recent earnings test and an undivided profits test) even if the relevant subsidiary would satisfy the equity capital requirements applicable to it after giving effect to the dividend. For example, the FRB, the FDIC and the New York State Department of Financial Services have authority to prohibit or to limit the payment of dividends by the banking organizations they supervise (including GS Bank USA) if, in the regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in the light of the financial condition of the banking organization.

In addition, subsidiaries not subject to separate regulatory capital requirements may hold capital to satisfy local tax and legal guidelines, rating agency requirements (for entities with assigned credit ratings) or internal policies, including policies concerning the minimum amount of capital a subsidiary should hold based on its underlying level of risk.

Group Inc.'s equity investment in subsidiaries was $90.22 billion as of December 2018 and $93.88 billion as of December 2017, of which Group Inc. was required to maintain $52.92 billion as of December 2018 and $53.02 billion as of December 2017, of minimum equity capital in its regulated subsidiaries in order to satisfy the regulatory requirements of such subsidiaries.

Group Inc.'s capital invested in certain non-U.S. subsidiaries is exposed to foreign exchange risk, substantially all of which is managed through a combination of derivatives and non-U.S. denominated debt. See Note 7 for information about the firm's net investment hedges used to hedge this risk.

**Note 21.**

## Earnings Per Common Share

Basic earnings per common share (EPS) is calculated by dividing net earnings applicable to common shareholders by the weighted average number of common shares outstanding and restricted stock units (RSUs) for which no future service is required as a condition to the delivery of the underlying common stock (collectively, basic shares). Diluted EPS includes the determinants of basic EPS and, in addition, reflects the dilutive effect of the common stock deliverable for stock options and for RSUs for which future service is required as a condition to the delivery of the underlying common stock.

The table below presents information about basic and diluted EPS.

| | Year Ended December | | |
|---|---|---|---|
| *in millions, except per share amounts* | **2018** | 2017 | 2016 |
| **Net earnings applicable to common shareholders** | **$9,860** | $3,685 | $7,087 |
| Weighted average basic shares | **385.4** | 401.6 | 427.4 |
| Effect of dilutive securities: | | | |
| RSUs | **3.9** | 5.3 | 4.7 |
| Stock options | **0.9** | 2.2 | 3.0 |
| Dilutive securities | **4.8** | 7.5 | 7.7 |
| **Weighted average basic shares and dilutive securities** | **390.2** | 409.1 | 435.1 |
| **Basic EPS** | **$25.53** | $ 9.12 | $16.53 |
| **Diluted EPS** | **$25.27** | $ 9.01 | $16.29 |

In the table above:

- Unvested share-based awards that have non-forfeitable rights to dividends or dividend equivalents are treated as a separate class of securities in calculating EPS. The impact of applying this methodology was a reduction in basic EPS of $0.05 for 2018, $0.06 for 2017 and $0.05 for 2016.
- Diluted EPS does not include antidilutive securities (RSUs and common shares underlying stock options) of less than 0.1 million for 2018, 0.1 million for 2017 and 2.8 million for 2016.

**Note 22.**

## Transactions with Affiliated Funds

The firm has formed numerous nonconsolidated investment funds with third-party investors. As the firm generally acts as the investment manager for these funds, it is entitled to receive management fees and, in certain cases, advisory fees or incentive fees from these funds. Additionally, the firm invests alongside the third-party investors in certain funds.

The tables below present fees earned from affiliated funds, fees receivable from affiliated funds and the aggregate carrying value of the firm's interests in affiliated funds.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Fees earned from funds | **$3,571** | $2,932 | $2,777 |

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Fees receivable from funds | **$ 610** | $ 637 |
| Aggregate carrying value of interests in funds | **$4,994** | $4,993 |

The firm may periodically determine to waive certain management fees on selected money market funds. Management fees waived were $51 million for 2018 and $98 million for 2017.

The Volcker Rule restricts the firm from providing financial support to covered funds (as defined in the rule) after the expiration of the conformance period. As a general matter, in the ordinary course of business, the firm does not expect to provide additional voluntary financial support to any covered funds but may choose to do so with respect to funds that are not subject to the Volcker Rule; however, in the event that such support is provided, the amount is not expected to be material.

The firm had an outstanding guarantee, as permitted under the Volcker Rule, on behalf of its funds of $154 million as of both December 2018 and December 2017. The firm has voluntarily provided this guarantee in connection with a financing agreement with a third-party lender executed by one of the firm's real estate funds that is not covered by the Volcker Rule. As of both December 2018 and December 2017, except as noted above, the firm has not provided any additional financial support to its affiliated funds.

In addition, in the ordinary course of business, the firm may also engage in other activities with its affiliated funds including, among others, securities lending, trade execution, market-making, custody, and acquisition and bridge financing. See Note 18 for the firm's investment commitments related to these funds.

**Note 23.**

## Interest Income and Interest Expense

Interest is recorded over the life of the instrument on an accrual basis based on contractual interest rates.

The table below presents sources of interest income and interest expense.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Interest income** | | | |
| Deposits with banks | **$ 1,418** | $ 819 | $ 452 |
| Collateralized agreements | **3,852** | 1,661 | 691 |
| Financial instruments owned | **6,894** | 5,904 | 5,444 |
| Loans receivable | **4,148** | 2,678 | 1,843 |
| Other interest | **3,367** | 2,051 | 1,261 |
| **Total interest income** | **19,679** | 13,113 | 9,691 |
| **Interest expense** | | | |
| Deposits | **2,606** | 1,380 | 878 |
| Collateralized financings | **2,051** | 863 | 442 |
| Financial instruments sold, but not yet purchased | **1,554** | 1,388 | 1,251 |
| Secured and unsecured borrowings: | | | |
| Short-term | **695** | 698 | 446 |
| Long-term | **5,555** | 4,599 | 4,242 |
| Other interest | **3,451** | 1,253 | (155) |
| **Total interest expense** | **15,912** | 10,181 | 7,104 |
| **Net interest income** | **$ 3,767** | $ 2,932 | $2,587 |

In the table above:

- Collateralized agreements includes rebates paid and interest income on securities borrowed.
- Other interest income includes interest income on customer debit balances and other interest-earning assets.
- Collateralized financings consists of repurchase agreements and securities loaned.
- Other interest expense includes rebates received on other interest-bearing liabilities and interest expense on customer credit balances.

**Note 24.**

## Income Taxes

### Tax Legislation

The provision for taxes for 2017 reflected an estimated impact of Tax Legislation of $4.40 billion. The $4.40 billion income tax expense included the repatriation tax on undistributed earnings of foreign subsidiaries, the effects of the implementation of a territorial tax system, and the remeasurement of U.S. deferred tax assets at lower enacted tax rates. During 2018, the firm finalized this estimate to reflect the impact of updated information, including subsequent guidance issued by the U.S. Internal Revenue Service (IRS), resulting in a $487 million income tax benefit.

### Provision for Income Taxes

Income taxes are provided for using the asset and liability method under which deferred tax assets and liabilities are recognized for temporary differences between the financial reporting and tax bases of assets and liabilities. The firm reports interest expense related to income tax matters in provision for taxes and income tax penalties in other expenses.

The table below presents information about the provision for taxes.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Current taxes** | | | |
| U.S. federal | **$ 2,986** | $ 320 | $1,032 |
| State and local | **379** | 64 | 139 |
| Non-U.S. | **1,302** | 1,004 | 1,184 |
| **Total current tax expense** | **4,667** | 1,388 | 2,355 |
| **Deferred taxes** | | | |
| U.S. federal | **(2,711)** | 5,083 | 399 |
| State and local | **58** | 157 | 51 |
| Non-U.S. | **8** | 218 | 101 |
| **Total deferred tax (benefit)/expense** | **(2,645)** | 5,458 | 551 |
| **Provision for taxes** | **$ 2,022** | $6,846 | $2,906 |

In the table above:

- State and local current taxes in 2017 and 2016 includes the impact of settlements of state and local examinations.
- U.S. federal current tax expense and U.S. federal deferred tax expense in 2018 and 2017 includes the impact of Tax Legislation.

The table below presents a reconciliation of the U.S. federal statutory income tax rate to the effective income tax rate.

| | Year Ended December | | |
|---|---|---|---|
| | **2018** | 2017 | 2016 |
| U.S. federal statutory income tax rate | **21.0%** | 35.0% | 35.0% |
| State and local taxes, net of U.S. federal income tax effects | **2.0** | 1.5 | 0.9 |
| ASU No. 2016-09 Tax benefits on settlement of employee share-based awards | **(2.2)** | (6.4) | – |
| Non-U.S. operations | **(0.7)** | (6.3) | (6.7) |
| Tax credits | **(1.4)** | (2.1) | (2.0) |
| Tax-exempt income, including dividends | **(0.6)** | (0.2) | (0.3) |
| Tax Legislation | **(3.9)** | 39.5 | – |
| Non-deductible legal expenses | **1.2** | 0.5 | 1.0 |
| Other | **0.8** | – | 0.3 |
| **Effective income tax rate** | **16.2%** | 61.5% | 28.2% |

In the table above:

- Non-U.S. operations in 2018 includes the impact of the Base Erosion and Anti-Abuse Tax and Global Intangible Low Taxed Income (GILTI).
- Non-U.S. operations in 2017 and 2016 includes the impact of permanently reinvested earnings and excludes the estimated impact of Tax Legislation.
- State and local taxes in 2017 and 2016, net of U.S. federal income tax effects, includes the impact of settlements of state and local examinations.

### Deferred Income Taxes

Deferred income taxes reflect the net tax effects of temporary differences between the financial reporting and tax bases of assets and liabilities. These temporary differences result in taxable or deductible amounts in future years and are measured using the tax rates and laws that will be in effect when such differences are expected to reverse. Valuation allowances are established to reduce deferred tax assets to the amount that more likely than not will be realized and primarily relate to the ability to utilize losses in various tax jurisdictions. Tax assets are included in other assets and tax liabilities are included in other liabilities.

The table below presents information about deferred tax assets and liabilities, excluding the impact of netting within tax jurisdictions.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| **Deferred tax assets** | | |
| Compensation and benefits | **$1,296** | $1,233 |
| ASC 740 asset related to unrecognized tax benefits | **152** | 75 |
| Non-U.S. operations | **264** | – |
| Net operating losses | **688** | 428 |
| Occupancy-related | **71** | 67 |
| Other comprehensive income-related | **–** | 408 |
| Tax credits carryforward | **62** | 1,006 |
| Other, net | **434** | 113 |
| Subtotal | **2,967** | 3,330 |
| Valuation allowance | **(245)** | (156) |
| **Total deferred tax assets** | **$2,722** | $3,174 |
| **Deferred tax liabilities** | | |
| Depreciation and amortization | **$ 996** | $ 826 |
| Tax Legislation — repatriation tax | **–** | 3,114 |
| Non-U.S. operations | **–** | 180 |
| Unrealized gains | **1,290** | 742 |
| Other comprehensive income-related | **84** | – |
| **Total deferred tax liabilities** | **$2,370** | $4,862 |

The firm has recorded deferred tax assets of $688 million as of December 2018 and $428 million as of December 2017, in connection with U.S. federal, state and local and foreign net operating loss carryforwards. The firm also recorded a valuation allowance of $81 million as of December 2018 and $128 million as of December 2017, related to these net operating loss carryforwards.

As of December 2018, the U.S. federal net operating loss carryforward was $259 million, the state and local net operating loss carryforward was $1.35 billion, and the foreign net operating loss carryforward was $2.39 billion. If not utilized, the U.S. federal, state and local, and foreign net operating loss carryforwards will begin to expire in 2019. If these carryforwards expire, they will not have a material impact on the firm's results of operations. As of December 2018, the firm has recorded deferred tax assets of $24 million in connection with foreign tax credit carryforwards and a valuation allowance of $24 million related to these foreign tax credit carryforwards. As of December 2018, the firm has recorded deferred tax assets of $38 million in connection with state and local tax credit carryforwards. If not utilized, the foreign tax credit carryforward will expire in 2028 and the state and local tax credit carryforward will begin to expire in 2020. As of December 2018, the firm did not have any general business credit carryforwards.

As of both December 2018 and December 2017, the firm had no U.S. capital loss carryforwards and no related net deferred income tax assets. As of December 2018, the firm had deferred tax assets of $77 million in connection with foreign capital loss carryforwards and a valuation allowance of $77 million related to these capital loss carryforwards. As of December 2017, there were no foreign capital loss carryforwards.

The valuation allowance increased by $89 million during 2018 and increased by $41 million during 2017. The increases in both 2018 and 2017 were primarily due to an increase in deferred tax assets from which the firm does not expect to realize any benefit.

The firm permanently reinvested eligible earnings of certain foreign subsidiaries. As of December 2018, all U.S. taxes were accrued on these subsidiaries' distributable earnings, substantially all of which resulted from the Tax Legislation repatriation tax and GILTI. As of December 2017, substantially all U.S. taxes were accrued on these subsidiaries' earnings and profits as a result of the Tax Legislation repatriation tax.

## Unrecognized Tax Benefits

The firm recognizes tax positions in the consolidated financial statements only when it is more likely than not that the position will be sustained on examination by the relevant taxing authority based on the technical merits of the position. A position that meets this standard is measured at the largest amount of benefit that will more likely than not be realized on settlement. A liability is established for differences between positions taken in a tax return and amounts recognized in the consolidated financial statements.

The accrued liability for interest expense related to income tax matters and income tax penalties was $107 million as of December 2018 and $81 million as of December 2017. The firm recognized interest expense and income tax penalties of $18 million for 2018, $63 million for 2017 and $27 million for 2016. It is reasonably possible that unrecognized tax benefits could change significantly during the twelve months subsequent to December 2018 due to potential audit settlements. However, at this time it is not possible to estimate any potential change.

The table below presents the changes in the liability for unrecognized tax benefits, which is included in other liabilities.

| | Year Ended or as of December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Beginning balance | **$ 665** | $ 852 | $ 825 |
| Increases based on tax positions related to the current year | **197** | 94 | 113 |
| Increases based on tax positions related to prior years | **232** | 101 | 188 |
| Decreases based on tax positions related to prior years | **(39)** | (128) | (88) |
| Decreases related to settlements | **(3)** | (255) | (186) |
| Exchange rate fluctuations | **(1)** | 1 | – |
| **Ending balance** | **$1,051** | $ 665 | $ 852 |
| Related deferred income tax asset | **152** | 75 | 231 |
| **Net unrecognized tax benefit** | **$ 899** | $ 590 | $ 621 |

## Regulatory Tax Examinations

The firm is subject to examination by the IRS and other taxing authorities in jurisdictions where the firm has significant business operations, such as the United Kingdom, Japan, Hong Kong and various states, such as New York. The tax years under examination vary by jurisdiction. The firm does not expect completion of these audits to have a material impact on the firm's financial condition but it may be material to operating results for a particular period, depending, in part, on the operating results for that period.

The table below presents the earliest tax years that remain subject to examination by major jurisdiction.

| Jurisdiction | As of December 2018 |
|---|---|
| U.S. Federal | **2011** |
| New York State and City | **2011** |
| United Kingdom | **2014** |
| Japan | **2014** |
| Hong Kong | **2011** |

U.S. Federal examinations of 2011 and 2012 began in 2013. The firm has been accepted into the Compliance Assurance Process program by the IRS for each of the tax years from 2013 through 2019. This program allows the firm to work with the IRS to identify and resolve potential U.S. Federal tax issues before the filing of tax returns. The 2013 through 2017 tax years remain subject to post-filing review.

New York State and City examinations (excluding GS Bank USA) of 2011 through 2014 began in 2017. New York State and City examinations for GS Bank USA have been completed through 2014.

All years including and subsequent to the years in the table above remain open to examination by the taxing authorities. The firm believes that the liability for unrecognized tax benefits it has established is adequate in relation to the potential for additional assessments.

## Note 25.

# Business Segments

The firm reports its activities in the following four business segments: Investment Banking, Institutional Client Services, Investing & Lending and Investment Management.

### Basis of Presentation

In reporting segments, certain of the firm's business lines have been aggregated where they have similar economic characteristics and are similar in each of the following areas: (i) the nature of the services they provide, (ii) their methods of distribution, (iii) the types of clients they serve and (iv) the regulatory environments in which they operate.

The cost drivers of the firm taken as a whole, compensation, headcount and levels of business activity, are broadly similar in each of the firm's business segments. Compensation and benefits expenses in the firm's segments reflect, among other factors, the overall performance of the firm, as well as the performance of individual businesses. Consequently, pre-tax margins in one segment of the firm's business may be significantly affected by the performance of the firm's other business segments.

The firm allocates assets (including allocations of global core liquid assets and cash, secured client financing and other assets), revenues and expenses among the four business segments. Due to the integrated nature of these segments, estimates and judgments are made in allocating certain assets, revenues and expenses. The allocation process is based on the manner in which management currently views the performance of the segments.

Management believes that this allocation provides a reasonable representation of each segment's contribution to consolidated pre-tax earnings and total assets. Transactions between segments are based on specific criteria or approximate third-party rates.

The table below presents net revenues, provision for credit losses, operating expenses and pre-tax earnings by segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Investment Banking** | | | |
| Financial Advisory | **$ 3,507** | $ 3,188 | $ 2,932 |
| Equity underwriting | **1,646** | 1,243 | 891 |
| Debt underwriting | **2,709** | 2,940 | 2,450 |
| Total Underwriting | **4,355** | 4,183 | 3,341 |
| **Total net revenues** | **7,862** | 7,371 | 6,273 |
| Operating expenses | **4,346** | 3,526 | 3,437 |
| **Pre-tax earnings** | **$ 3,516** | $ 3,845 | $ 2,836 |
| **Institutional Client Services** | | | |
| FICC Client Execution | **$ 5,882** | $ 5,299 | $ 7,556 |
| Equities client execution | **2,835** | 2,046 | 2,194 |
| Commissions and fees | **3,055** | 2,920 | 3,078 |
| Securities services | **1,710** | 1,637 | 1,639 |
| Total Equities | **7,600** | 6,603 | 6,911 |
| **Total net revenues** | **13,482** | 11,902 | 14,467 |
| Operating expenses | **10,351** | 9,692 | 9,713 |
| **Pre-tax earnings** | **$ 3,131** | $ 2,210 | $ 4,754 |
| **Investing & Lending** | | | |
| Equity securities | **$ 4,455** | $ 4,578 | $ 2,573 |
| Debt securities and loans | **3,795** | 2,660 | 1,689 |
| **Total net revenues** | **8,250** | 7,238 | 4,262 |
| Provision for credit losses | **674** | 657 | 182 |
| Operating expenses | **3,365** | 2,796 | 2,386 |
| **Pre-tax earnings** | **$ 4,211** | $ 3,785 | $ 1,694 |
| **Investment Management** | | | |
| Management and other fees | **$ 5,438** | $ 5,144 | $ 4,798 |
| Incentive fees | **830** | 417 | 421 |
| Transaction revenues | **754** | 658 | 569 |
| **Total net revenues** | **7,022** | 6,219 | 5,788 |
| Operating expenses | **5,267** | 4,800 | 4,654 |
| **Pre-tax earnings** | **$ 1,755** | $ 1,419 | $ 1,134 |
| **Total net revenues** | **$36,616** | $32,730 | $30,790 |
| **Provision for credit losses** | **674** | 657 | 182 |
| **Total operating expenses** | **23,461** | 20,941 | 20,304 |
| **Total pre-tax earnings** | **$12,481** | $11,132 | $10,304 |

In the table above:

- Revenues and expenses directly associated with each segment are included in determining pre-tax earnings.
- Net revenues in the firm's segments include allocations of interest income and expense to specific securities, commodities and other positions in relation to the cash generated by, or funding requirements of, such positions. Net interest is included in segment net revenues as it is consistent with how management assesses segment performance.
- Overhead expenses not directly allocable to specific segments are allocated ratably based on direct segment expenses.
- Provision for credit losses, previously reported in Investing & Lending segment net revenues, is now reported as a separate line item in the consolidated statements of earnings. Previously reported amounts have been conformed to the current presentation.
- All operating expenses have been allocated to the firm's segments except for charitable contributions of $132 million for 2018, $127 million for 2017 and $114 million for 2016.
- Total operating expenses included net provisions for litigation and regulatory proceedings of $844 million for 2018, $188 million for 2017 and $396 million for 2016.

The table below presents assets by segment.

| | As of December | |
|---|---|---|
| *$ in millions* | **2018** | 2017 |
| Investment Banking | **$ 1,748** | $ 2,202 |
| Institutional Client Services | **656,920** | 675,255 |
| Investing & Lending | **259,104** | 226,016 |
| Investment Management | **14,024** | 13,303 |
| **Total assets** | **$931,796** | $916,776 |

The table below presents net interest income by segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Investment Banking | **$ –** | $ – | $ – |
| Institutional Client Services | **976** | 1,322 | 1,456 |
| Investing & Lending | **2,427** | 1,325 | 880 |
| Investment Management | **364** | 285 | 251 |
| **Total net interest income** | **$3,767** | $2,932 | $2,587 |

The table below presents depreciation and amortization expense by segment.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Investment Banking | **$ 114** | $ 124 | $126 |
| Institutional Client Services | **567** | 514 | 489 |
| Investing & Lending | **426** | 314 | 215 |
| Investment Management | **221** | 200 | 168 |
| **Total depreciation and amortization** | **$1,328** | $1,152 | $998 |

### Geographic Information

Due to the highly integrated nature of international financial markets, the firm manages its businesses based on the profitability of the enterprise as a whole. The methodology for allocating profitability to geographic regions is dependent on estimates and management judgment because a significant portion of the firm's activities require cross-border coordination in order to facilitate the needs of the firm's clients.

Geographic results are generally allocated as follows:

- Investment Banking: location of the client and investment banking team.
- Institutional Client Services: FICC Client Execution and Equities (excluding Securities services): location of the market-making desk; Securities services: location of the primary market for the underlying security.
- Investing & Lending: Investing: location of the investment; Lending: location of the client.
- Investment Management: location of the sales team.

The table below presents total net revenues, pre-tax earnings and net earnings (excluding Corporate) by geographic region allocated based on the methodology referred to above.

| | Year Ended December | | | | | |
|---|---|---|---|---|---|---|
| *$ in millions* | **2018** | | 2017 | | 2016 | |
| **Net revenues** | | | | | | |
| Americas | **$22,339** | **61%** | $19,737 | 60% | $18,301 | 60% |
| Europe, Middle East and Africa | **9,244** | **25%** | 8,168 | 25% | 8,065 | 26% |
| Asia | **5,033** | **14%** | 4,825 | 15% | 4,424 | 14% |
| **Total net revenues** | **$36,616** | **100%** | $32,730 | 100% | $30,790 | 100% |
| **Pre-tax earnings** | | | | | | |
| Americas | **$ 8,235** | **65%** | $ 7,119 | 63% | $ 6,352 | 61% |
| Europe, Middle East and Africa | **3,266** | **26%** | 2,583 | 23% | 2,883 | 28% |
| Asia | **1,112** | **9%** | 1,557 | 14% | 1,183 | 11% |
| Subtotal | **12,613** | **100%** | 11,259 | 100% | 10,418 | 100% |
| Corporate | **(132)** | | (127) | | (114) | |
| **Total pre-tax earnings** | **$12,481** | | $11,132 | | $10,304 | |
| **Net earnings** | | | | | | |
| Americas | **$ 6,960** | **66%** | $ 997 | 23% | $ 4,337 | 58% |
| Europe, Middle East and Africa | **2,636** | **25%** | 2,144 | 49% | 2,270 | 30% |
| Asia | **966** | **9%** | 1,241 | 28% | 870 | 12% |
| Subtotal | **10,562** | **100%** | 4,382 | 100% | 7,477 | 100% |
| Corporate | **(103)** | | (96) | | (79) | |
| **Total net earnings** | **$10,459** | | $ 4,286 | | $ 7,398 | |

In the table above:

- Americas net earnings included an income tax benefit of \$487 million in 2018 and estimated income tax expense of \$4.40 billion in 2017 related to Tax Legislation.
- Corporate pre-tax earnings includes charitable contributions that have not been allocated to the firm's geographic regions.
- Substantially all of the amounts in Americas were attributable to the U.S.
- Asia includes Australia and New Zealand.

**Note 26.**

## Credit Concentrations

The firm's concentrations of credit risk arise from its market making, client facilitation, investing, underwriting, lending and collateralized transactions, and cash management activities, and may be impacted by changes in economic, industry or political factors. These activities expose the firm to many different industries and counterparties, and may also subject the firm to a concentration of credit risk to a particular central bank, counterparty, borrower or issuer, including sovereign issuers, or to a particular clearing house or exchange. The firm seeks to mitigate credit risk by actively monitoring exposures and obtaining collateral from counterparties as deemed appropriate.

The firm measures and monitors its credit exposure based on amounts owed to the firm after taking into account risk mitigants that management considers when determining credit risk. Such risk mitigants include netting and collateral arrangements and economic hedges, such as credit derivatives, futures and forward contracts. Netting and collateral agreements permit the firm to offset receivables and payables with such counterparties and/or enable the firm to obtain collateral on an upfront or contingent basis.

The table below presents the credit concentrations in cash instruments included in financial instruments owned.

| | As of December | |
|---|---|---|
| *\$ in millions* | **2018** | 2017 |
| U.S. government and agency obligations | **\$110,616** | \$76,418 |
| % of total assets | **11.9%** | 8.3% |
| Non-U.S. government and agency obligations | **\$ 43,607** | \$33,956 |
| % of total assets | **4.7%** | 3.7% |

In addition, the firm had \$90.47 billion as of December 2018 and \$76.13 billion as of December 2017 of cash deposits held at central banks (included in cash and cash equivalents), of which \$29.20 billion as of December 2018 and \$50.86 billion as of December 2017 was held at the Federal Reserve Bank of New York.

As of both December 2018 and December 2017, the firm did not have credit exposure to any other counterparty that exceeded 2% of total assets.

Collateral obtained by the firm related to derivative assets is principally cash and is held by the firm or a third-party custodian. Collateral obtained by the firm related to resale agreements and securities borrowed transactions is primarily U.S. government and agency obligations and non-U.S. government and agency obligations. See Note 10 for further information about collateralized agreements and financings.

The table below presents U.S. government and agency obligations and non-U.S. government and agency obligations that collateralize resale agreements and securities borrowed transactions.

| | As of December | |
|---|---|---|
| *\$ in millions* | **2018** | 2017 |
| U.S. government and agency obligations | **\$ 78,828** | \$96,905 |
| Non-U.S. government and agency obligations | **\$ 76,745** | \$92,850 |

In the table above:

- Non-U.S. government and agency obligations primarily consists of securities issued by the governments of Japan, France, the U.K. and Germany.
- Given that the firm's primary credit exposure on such transactions is to the counterparty to the transaction, the firm would be exposed to the collateral issuer only in the event of counterparty default.

## Note 27.

## Legal Proceedings

The firm is involved in a number of judicial, regulatory and arbitration proceedings (including those described below) concerning matters arising in connection with the conduct of the firm's businesses. Many of these proceedings are in early stages, and many of these cases seek an indeterminate amount of damages.

Under ASC 450, an event is "reasonably possible" if "the chance of the future event or events occurring is more than remote but less than likely" and an event is "remote" if "the chance of the future event or events occurring is slight." Thus, references to the upper end of the range of reasonably possible loss for cases in which the firm is able to estimate a range of reasonably possible loss mean the upper end of the range of loss for cases for which the firm believes the risk of loss is more than slight.

With respect to matters described below for which management has been able to estimate a range of reasonably possible loss where (i) actual or potential plaintiffs have claimed an amount of money damages, (ii) the firm is being, or threatened to be, sued by purchasers in a securities offering and is not being indemnified by a party that the firm believes will pay the full amount of any judgment, or (iii) the purchasers are demanding that the firm repurchase securities, management has estimated the upper end of the range of reasonably possible loss as being equal to (a) in the case of (i), the amount of money damages claimed, (b) in the case of (ii), the difference between the initial sales price of the securities that the firm sold in such offering and the estimated lowest subsequent price of such securities prior to the action being commenced and (c) in the case of (iii), the price that purchasers paid for the securities less the estimated value, if any, as of December 2018 of the relevant securities, in each of cases (i), (ii) and (iii), taking into account any other factors believed to be relevant to the particular matter or matters of that type. As of the date hereof, the firm has estimated the upper end of the range of reasonably possible aggregate loss for such matters and for any other matters described below where management has been able to estimate a range of reasonably possible aggregate loss to be approximately $1.9 billion in excess of the aggregate reserves for such matters.

Management is generally unable to estimate a range of reasonably possible loss for matters other than those included in the estimate above, including where (i) actual or potential plaintiffs have not claimed an amount of money damages, except in those instances where management can otherwise determine an appropriate amount, (ii) matters are in early stages, (iii) matters relate to regulatory investigations or reviews, except in those instances where management can otherwise determine an appropriate amount, (iv) there is uncertainty as to the likelihood of a class being certified or the ultimate size of the class, (v) there is uncertainty as to the outcome of pending appeals or motions, (vi) there are significant factual issues to be resolved, and/or (vii) there are novel legal issues presented. For example, the firm's potential liabilities with respect to the investigations and reviews described below in "Regulatory Investigations and Reviews and Related Litigation" generally are not included in management's estimate of reasonably possible loss. However, management does not believe, based on currently available information, that the outcomes of such other matters will have a material adverse effect on the firm's financial condition, though the outcomes could be material to the firm's operating results for any particular period, depending, in part, upon the operating results for such period. See Note 18 for further information about mortgage-related contingencies.

### 1Malaysia Development Berhad (1MDB)-Related Matters

The firm has received subpoenas and requests for documents and information from various governmental and regulatory bodies and self-regulatory organizations as part of investigations and reviews relating to financing transactions and other matters involving 1MDB, a sovereign wealth fund in Malaysia. Subsidiaries of the firm acted as arrangers or purchasers of approximately $6.5 billion of debt securities of 1MDB.

On November 1, 2018, the U.S. Department of Justice (DOJ) unsealed a criminal information and guilty plea by Tim Leissner, a former participating managing director of the firm, and an indictment against Ng Chong Hwa, a former managing director of the firm, and Low Taek Jho. Leissner pleaded guilty to a two-count criminal information charging him with conspiring to launder money and conspiring to violate the U.S. Foreign Corrupt Practices Act's (FCPA) anti-bribery and internal accounting controls provisions. Low and Ng were charged in a three-count indictment with conspiring to launder money and conspiring to violate the FCPA's anti-bribery provisions. On August 28, 2018, Leissner's guilty plea was accepted by the U.S. District Court for the Eastern District of New York and Leissner was adjudicated guilty on both counts. Ng was also charged in this indictment with conspiring to violate the FCPA's internal accounting controls provisions. The charging documents state, among other things, that Leissner and Ng participated in a conspiracy to misappropriate proceeds of the 1MDB offerings for themselves and to pay bribes to various government officials to obtain and retain 1MDB business for the firm. The plea and charging documents indicate that Leissner and Ng knowingly and willfully circumvented the firm's system of internal accounting controls, in part by repeatedly lying to control personnel and internal committees that reviewed these offerings. The indictment of Ng and Low alleges that the firm's system of internal accounting controls could be easily circumvented and that the firm's business culture, particularly in Southeast Asia, at times prioritized consummation of deals ahead of the proper operation of its compliance functions. In addition, an unnamed participating managing director of the firm is alleged to have been aware of the bribery scheme and to have agreed not to disclose this information to the firm's compliance and control personnel. That employee, who was identified as a co-conspirator, has been put on administrative leave.

On December 17, 2018, the Attorney General of Malaysia issued a press statement that (i) criminal charges in Malaysia had been filed against Goldman Sachs International (GSI), as the arranger of three offerings of debt securities of 1MDB, aggregating approximately $6.5 billion in principal amount, for alleged disclosure deficiencies in the offering documents relating to, among other things, the use of proceeds for the debt securities, (ii) Goldman Sachs (Asia) LLC (GS Asia), Goldman Sachs (Singapore) PTE (GS Singapore), Leissner, Low and Jasmine Loo Ai Swan had been criminally charged in Malaysia, and Ng would be charged shortly, and (iii) prosecutors in Malaysia will seek criminal fines against the accused in excess of $2.7 billion plus the $600 million of fees received in connection with the debt offerings.

The firm has received multiple demands, beginning in November 2018, from alleged shareholders under Section 220 of the Delaware General Corporation Law for books and records relating to, among other things, the firm's involvement with 1MDB and the firm's compliance procedures.

On February 19, 2019, a purported shareholder derivative action relating to 1MDB was filed in the U.S. District Court for the Southern District of New York against Group Inc. and the current directors and a former chairman and chief executive officer of the firm. The complaint, which seeks unspecified damages and disgorgement, alleges breaches of fiduciary duties, including in connection with alleged insider trading by certain current and former directors, unjust enrichment, gross mismanagement and violations of the anti-fraud provisions of the Exchange Act, including in connection with Group Inc.'s common stock repurchases and solicitation of proxies.

On November 21, 2018, a summons with notice was filed in the New York Supreme Court, New York County, by International Petroleum Investment Company, which guaranteed certain debt securities issued by 1MDB, and its subsidiary Aabar Investments PJS. The summons with notice makes unspecified claims relating to 1MDB and seeks unspecified compensatory and punitive damages and other relief against Group Inc., GSI, GS Asia, GS Singapore, Goldman Sachs (Malaysia) SDN BHD, Leissner, Ng, and an employee of the firm, as well as individuals (who are not employees of the firm) formerly associated with the plaintiffs.

On December 20, 2018, a putative securities class action lawsuit was filed in the U.S. District Court for the Southern District of New York against Group Inc. and certain current and former officers of the firm alleging violations of the anti-fraud provisions of the Exchange Act with respect to Group Inc.'s disclosures concerning 1MDB and seeking unspecified damages.

The firm is cooperating with the DOJ and all other governmental and regulatory investigations relating to 1MDB. Proceedings by the DOJ or other governmental or regulatory authorities could result in the imposition of significant fines, penalties and other sanctions against the firm, including restrictions on the firm's activities.

### Mortgage-Related Matters

Beginning in April 2010, a number of purported securities law class actions were filed in the U.S. District Court for the Southern District of New York challenging the adequacy of Group Inc.'s public disclosure of, among other things, the firm's activities in the collateralized debt obligation market, and the firm's conflict of interest management.

The consolidated amended complaint filed on July 25, 2011, which names as defendants Group Inc. and certain current and former officers and employees of Group Inc. and its affiliates, generally alleges violations of Sections 10(b) and 20(a) of the Exchange Act and seeks unspecified damages. The defendants have moved for summary judgment. On December 11, 2018, the Second Circuit Court of Appeals granted the defendants' petition for interlocutory review of the district court's August 14, 2018 grant of class certification. On January 23, 2019, the district court stayed proceedings in the district court pending the appellate court's decision.

In June 2012, the Board received a demand from a shareholder that the Board investigate and take action relating to the firm's mortgage-related activities and to stock sales by certain directors and executives of the firm. On February 15, 2013, this shareholder filed a putative shareholder derivative action in New York Supreme Court, New York County, against Group Inc. and certain current or former directors and employees, based on these activities and stock sales. The derivative complaint includes allegations of breach of fiduciary duty, unjust enrichment, abuse of control, gross mismanagement and corporate waste, and seeks, among other things, unspecified monetary damages, disgorgement of profits and certain corporate governance and disclosure reforms. On May 28, 2013, Group Inc. informed the shareholder that the Board completed its investigation and determined to refuse the demand. On June 20, 2013, the shareholder made a books and records demand requesting materials relating to the Board's determination. The parties have agreed to stay proceedings in the putative derivative action pending resolution of the books and records demand.

In addition, the Board has received books and records demands from several shareholders for materials relating to, among other subjects, the firm's mortgage servicing and foreclosure activities, participation in federal programs providing assistance to financial institutions and homeowners, loan sales to Fannie Mae and Freddie Mac, mortgage-related activities and conflicts management.

Beginning on February 15, 2019, two summonses with notice were filed against Goldman Sachs Mortgage Company and GS Mortgage Securities Corp. in New York Supreme Court, New York County, by U.S. Bank National Association, as trustee for two residential mortgage-backed securitization trusts. The summonses with notice generally allege that mortgage loans in the trusts failed to conform to applicable representations and warranties and seek specific performance or, alternatively, compensatory damages and other relief.

The firm has received subpoenas or requests for information from, and is engaged in discussions with, certain regulators and law enforcement agencies with which it has not entered into settlement agreements as part of inquiries or investigations relating to mortgage-related matters.

### Director Compensation-Related Litigation

On May 9, 2017, Group Inc. and certain of its current and former directors were named as defendants in a purported direct and derivative shareholder action in the Court of Chancery of the State of Delaware (a similar purported derivative action, filed in June 2015, alleging excessive director compensation over the period 2012 to 2014 was voluntarily dismissed without prejudice in December 2016). The new complaint alleges that excessive compensation has been paid to the non-employee director defendants since 2015, and that certain disclosures in connection with soliciting shareholder approval of the stock incentive plans were deficient. The complaint asserts claims for breaches of fiduciary duties and seeks, among other things, rescission or in some cases rescissory damages, disgorgement, and shareholder votes on several matters. On October 23, 2018, the court declined to approve the parties' proposed settlement. The defendants' July 2017 motion to dismiss is still pending.

### Currencies-Related Litigation

GS&Co. and Group Inc. are among the defendants named in putative class actions filed in the U.S. District Court for the Southern District of New York beginning in September 2016 on behalf of putative indirect purchasers of foreign exchange instruments. The consolidated amended complaint, filed on June 30, 2017, generally alleged a conspiracy to manipulate the foreign currency exchange markets and asserted claims under federal and state antitrust laws and state consumer protection laws. On March 15, 2018, the Court granted defendants' motion to dismiss, and on October 25, 2018, plaintiffs' motion for leave to replead was denied as to the claim under federal antitrust law and granted as to the claims under state antitrust and consumer protection laws. On November 28, 2018, the plaintiffs filed a second consolidated amended complaint asserting claims under various state antitrust laws and state consumer protection laws and seeking treble damages in an unspecified amount.

GS&Co. and Group Inc. are among the defendants named in an action filed in the U.S. District Court for the Southern District of New York on November 7, 2018 by certain direct purchasers of foreign exchange instruments that opted out of a class settlement reached with, among others, GS&Co. and Group Inc. The complaint generally alleges that the defendants violated federal antitrust laws in connection with an alleged conspiracy to manipulate the foreign currency exchange markets and seeks injunctive relief, as well as treble damages in an unspecified amount.

GS&Co. and Group Inc. are among the defendants named in two putative class actions filed in the district court of the Central District in Israel on behalf of direct purchasers of foreign exchange instruments. The complaints, filed on September 11, 2018 and September 29, 2018, respectively, generally allege a conspiracy to manipulate prices of foreign exchange instruments. The second putative class action also asserts claims based on misuse of the "last look" features of foreign exchange trading systems.

### Financial Advisory Services

Group Inc. and certain of its affiliates are from time to time parties to various civil litigation and arbitration proceedings and other disputes with clients and third parties relating to the firm's financial advisory activities. These claims generally seek, among other things, compensatory damages and, in some cases, punitive damages, and in certain cases allege that the firm did not appropriately disclose or deal with conflicts of interest.

### Underwriting Litigation

Firm affiliates are among the defendants in a number of proceedings in connection with securities offerings. In these proceedings, including those described below, the plaintiffs assert class action or individual claims under federal and state securities laws and in some cases other applicable laws, allege that the offering documents for the securities that they purchased contained material misstatements and omissions, and generally seek compensatory and rescissory damages in unspecified amounts. Certain of these proceedings involve additional allegations.

**Cobalt International Energy.** Group Inc., certain former directors of Cobalt International Energy, Inc. (Cobalt), who were designated by affiliates of Group Inc., and GS&Co. are among defendants in a putative securities class action relating to certain offerings of Cobalt's securities, and are among the parties that have reached a settlement. On February 13, 2019, the court approved a settlement of the claims against the Goldman Sachs defendants. The firm has paid its full contribution to the settlement fund.

**Adeptus Health.** GS&Co. is among the underwriters named as defendants in several putative securities class actions, filed beginning in October 2016 and consolidated in the U.S. District Court for the Eastern District of Texas. In addition to the underwriters, the defendants include certain former directors and officers of Adeptus Health Inc. (Adeptus), as well as Adeptus' sponsor. As to the underwriters, the consolidated complaint, filed on November 21, 2017, relates to the $124 million June 2014 initial public offering, the $154 million May 2015 secondary equity offering, the $411 million July 2015 secondary equity offering, and the $175 million June 2016 secondary equity offering. GS&Co. underwrote 1.69 million shares of common stock in the June 2014 initial public offering representing an aggregate offering price of approximately $37 million, 962,378 shares of common stock in the May 2015 offering representing an aggregate offering price of approximately $61 million, 1.76 million shares of common stock in the July 2015 offering representing an aggregate offering price of approximately $184 million, and all the shares of common stock in the June 2016 offering representing an aggregate offering price of approximately $175 million. On April 19, 2017, Adeptus filed for Chapter 11 bankruptcy. On September 12, 2018, the defendants' motions to dismiss were granted as to the June 2014 and May 2015 offerings but denied as to the July 2015 and June 2016 offerings. On September 26, 2018, plaintiffs filed an amended consolidated complaint to remove the dismissed claims. On December 7, 2018, plaintiffs moved for class certification.

**SunEdison.** GS&Co. is among the underwriters named as defendants in several putative class actions and individual actions filed beginning in March 2016 relating to the August 2015 public offering of $650 million of SunEdison, Inc. (SunEdison) convertible preferred stock. The defendants also include certain of SunEdison's directors and officers. On April 21, 2016, SunEdison filed for Chapter 11 bankruptcy. The pending cases were transferred to the U.S. District Court for the Southern District of New York and on March 17, 2017, plaintiffs in the putative class action filed a consolidated amended complaint. GS&Co., as underwriter, sold 138,890 shares of SunEdison convertible preferred stock in the offering, representing an aggregate offering price of approximately $139 million. On March 6, 2018, the defendants' motion to dismiss in the class action was granted in part and denied in part. On February 11, 2019, plaintiffs' motion for class certification in the class action was granted. On April 10, 2018 and April 17, 2018, certain plaintiffs in the individual actions filed amended complaints. The defendants have reached a settlement with certain plaintiffs in the individual actions.

**Valeant Pharmaceuticals International.** GS&Co. and Goldman Sachs Canada Inc. (GS Canada) are among the underwriters and initial purchasers named as defendants in a putative class action filed on March 2, 2016 in the Superior Court of Quebec, Canada. In addition to the underwriters and initial purchasers, the defendants include Valeant Pharmaceuticals International, Inc. (Valeant), certain directors and officers of Valeant and Valeant's auditor. As to GS&Co. and GS Canada, the complaint relates to the June 2013 public offering of $2.3 billion of common stock, the June 2013 Rule 144A offering of $3.2 billion principal amount of senior notes, and the November 2013 Rule 144A offering of $900 million principal amount of senior notes. The complaint asserts claims under the Quebec Securities Act and the Civil Code of Quebec. On August 29, 2017, the court certified a class that includes only non-U.S. purchasers in the offerings. Defendants' motion for leave to appeal the certification was denied on November 30, 2017.

GS&Co. and GS Canada, as sole underwriters, sold 5,334,897 shares of common stock in the June 2013 offering to non-U.S. purchasers representing an aggregate offering price of approximately $453 million and, as initial purchasers, had a proportional share of sales to non-U.S. purchasers of approximately CAD14.2 million in principal amount of senior notes in the June 2013 and November 2013 Rule 144A offerings.

**Snap Inc.** GS&Co. is among the underwriters named as defendants in putative securities class actions pending in California Superior Court, County of Los Angeles and the U.S. District Court for the Central District of California beginning in May 2017, relating to Snap Inc.'s $3.91 billion March 2017 initial public offering. In addition to the underwriters, the defendants include Snap Inc. and certain of its officers and directors. GS&Co. underwrote 57,040,000 shares of common stock representing an aggregate offering price of approximately $970 million. The underwriter defendants, including GS&Co., were voluntarily dismissed from the federal action on September 18, 2018.

**Sea Limited.** GS Asia is among the underwriters named as defendants in a putative securities class action filed on November 1, 2018 in the Supreme Court of New York, County of New York, relating to Sea Limited's $989 million October 2017 initial public offering of American depository shares. In addition to the underwriters, the defendants include Sea Limited and certain of its officers and directors. GS Asia underwrote 28,026,721 American depository shares representing an aggregate offering price of approximately $420 million. On January 25, 2019, the plaintiffs filed an amended complaint.

### Investment Management Services

Group Inc. and certain of its affiliates are parties to various civil litigation and arbitration proceedings and other disputes with clients relating to losses allegedly sustained as a result of the firm's investment management services. These claims generally seek, among other things, restitution or other compensatory damages and, in some cases, punitive damages.

### Interest Rate Swap Antitrust Litigation

Group Inc., GS&Co., GSI, GS Bank USA and Goldman Sachs Financial Markets, L.P. (GSFM) are among the defendants named in a putative antitrust class action relating to the trading of interest rate swaps, filed in November 2015 and consolidated in the U.S. District Court for the Southern District of New York. The same Goldman Sachs entities also are among the defendants named in two antitrust actions relating to the trading of interest rate swaps, commenced in April 2016 and June 2018, respectively, in the U.S. District Court for the Southern District of New York by three operators of swap execution facilities and certain of their affiliates. These actions have been consolidated for pretrial proceedings. The complaints generally assert claims under federal antitrust law and state common law in connection with an alleged conspiracy among the defendants to preclude exchange trading of interest rate swaps. The complaints in the individual actions also assert claims under state antitrust law. The complaints seek declaratory and injunctive relief, as well as treble damages in an unspecified amount. Defendants moved to dismiss the class and the first individual action on January 20, 2017. On July 28, 2017, the district court issued a decision dismissing the state common law claims asserted by the plaintiffs in the first individual action and otherwise limiting the state common law claim in the putative class action and the antitrust claims in both actions to the period from 2013 to 2016. On May 30, 2018, plaintiffs in the putative class action filed a third consolidated amended complaint, adding allegations as to the surviving claims. On October 26, 2018, plaintiffs in the putative class action filed a motion for leave to file a fourth amended complaint. On November 20, 2018, the court granted in part and denied in part the defendants' motion to dismiss the second individual action, dismissing the state common law claims for unjust enrichment and tortious interference but denying dismissal of the federal and state antitrust claims.

### Securities Lending Antitrust Litigation

Group Inc. and GS&Co. are among the defendants named in a putative antitrust class action and two individual actions relating to securities lending practices filed in the U.S. District Court for the Southern District of New York beginning in August 2017. The complaints generally assert claims under federal antitrust law and state common law in connection with an alleged conspiracy among the defendants to preclude the development of electronic platforms for securities lending transactions. The individual complaints also assert claims for tortious interference with business relations and under state trade practices law and, in the second individual action, unjust enrichment under state common law. The complaints seek declaratory and injunctive relief, as well as treble damages and restitution in unspecified amounts. Group Inc. was voluntarily dismissed from the putative class action on January 26, 2018. Defendants moved to dismiss the first individual action on June 1, 2018 and moved to dismiss the second individual action on December 21, 2018. Defendants' motion to dismiss the class action complaint was denied on September 27, 2018.

### Credit Default Swap Antitrust Litigation

Group Inc., GS&Co., GSI, GS Bank USA and GSFM are among the defendants named in an antitrust action relating to the trading of credit default swaps filed in the U.S. District Court for the Southern District of New York on June 8, 2017 by the operator of a swap execution facility and certain of its affiliates. The complaint generally asserts claims under federal and state antitrust laws and state common law in connection with an alleged conspiracy among the defendants to preclude trading of credit default swaps on the plaintiffs' swap execution facility. The complaint seeks declaratory and injunctive relief, as well as treble damages in an unspecified amount. Defendants moved to dismiss on September 11, 2017.

### Commodities-Related Litigation

GSI is among the defendants named in putative class actions relating to trading in platinum and palladium, filed beginning on November 25, 2014 and most recently amended on May 15, 2017, in the U.S. District Court for the Southern District of New York. The amended complaint generally alleges that the defendants violated federal antitrust laws and the Commodity Exchange Act in connection with an alleged conspiracy to manipulate a benchmark for physical platinum and palladium prices and seek declaratory and injunctive relief, as well as treble damages in an unspecified amount. Defendants moved to dismiss the third consolidated amended complaint on July 21, 2017.

### U.S. Treasury Securities Litigation

GS&Co. is among the primary dealers named as defendants in several putative class actions relating to the market for U.S. Treasury securities, filed beginning in July 2015 and consolidated in the U.S. District Court for the Southern District of New York. GS&Co. is also among the primary dealers named as defendants in a similar individual action filed in the U.S. District Court for the Southern District of New York on August 25, 2017. The consolidated class action complaint, filed on December 29, 2017, generally alleges that the defendants violated antitrust laws in connection with an alleged conspiracy to manipulate the when-issued market and auctions for U.S. Treasury securities and that certain defendants, including GS&Co., colluded to preclude trading of U.S. Treasury securities on electronic trading platforms in order to impede competition in the bidding process. The individual action alleges a similar conspiracy regarding manipulation of the when-issued market and auctions, as well as related futures and options in violation of the Commodity Exchange Act. The complaints seek declaratory and injunctive relief, treble damages in an unspecified amount and restitution. Defendants moved to dismiss on February 23, 2018.

### Employment-Related Matters

On September 15, 2010, a putative class action was filed in the U.S. District Court for the Southern District of New York by three female former employees. The complaint, as subsequently amended, alleges that Group Inc. and GS&Co. have systematically discriminated against female employees in respect of compensation, promotion and performance evaluations. The complaint alleges a class consisting of all female employees employed at specified levels in specified areas by Group Inc. and GS&Co. since July 2002, and asserts claims under federal and New York City discrimination laws. The complaint seeks class action status, injunctive relief and unspecified amounts of compensatory, punitive and other damages.

On July 17, 2012, the district court issued a decision granting in part Group Inc.'s and GS&Co.'s motion to strike certain of plaintiffs' class allegations on the ground that plaintiffs lacked standing to pursue certain equitable remedies and denying Group Inc.'s and GS&Co.'s motion to strike plaintiffs' class allegations in their entirety as premature. On March 21, 2013, the U.S. Court of Appeals for the Second Circuit held that arbitration should be compelled with one of the named plaintiffs, who as a managing director was a party to an arbitration agreement with the firm. On March 10, 2015, the magistrate judge to whom the district judge assigned the remaining plaintiffs' May 2014 motion for class certification recommended that the motion be denied in all respects. On August 3, 2015, the magistrate judge granted the plaintiffs' motion to intervene two female individuals, one of whom was employed by the firm as of September 2010 and the other of whom ceased to be an employee of the firm subsequent to the magistrate judge's decision. On March 30, 2018, the district court certified a damages class as to the plaintiffs' disparate impact and treatment claims. On September 4, 2018, the Second Circuit Court of Appeals denied defendants' petition for interlocutory review of the district court's class certification decision and subsequently denied defendants' petition for rehearing. On September 27, 2018, plaintiffs advised the district court that they would not seek to certify a class for injunctive and declaratory relief.

**Regulatory Investigations and Reviews and Related Litigation**

Group Inc. and certain of its affiliates are subject to a number of other investigations and reviews by, and in some cases have received subpoenas and requests for documents and information from, various governmental and regulatory bodies and self-regulatory organizations and litigation and shareholder requests relating to various matters relating to the firm's businesses and operations, including:

- The 2008 financial crisis;
- The public offering process;
- The firm's investment management and financial advisory services;
- Conflicts of interest;
- Research practices, including research independence and interactions between research analysts and other firm personnel, including investment banking personnel, as well as third parties;
- Transactions involving government-related financings and other matters, municipal securities, including wall-cross procedures and conflict of interest disclosure with respect to state and municipal clients, the trading and structuring of municipal derivative instruments in connection with municipal offerings, political contribution rules, municipal advisory services and the possible impact of credit default swap transactions on municipal issuers;
- The offering, auction, sales, trading and clearance of corporate and government securities, currencies, commodities and other financial products and related sales and other communications and activities, as well as the firm's supervision and controls relating to such activities, including compliance with applicable short sale rules, algorithmic, high-frequency and quantitative trading, the firm's U.S. alternative trading system (dark pool), futures trading, options trading, when-issued trading, transaction reporting, technology systems and controls, securities lending practices, trading and clearance of credit derivative instruments and interest rate swaps, commodities activities and metals storage, private placement practices, allocations of and trading in securities, and trading activities and communications in connection with the establishment of benchmark rates, such as currency rates;
- Compliance with the FCPA;
- The firm's hiring and compensation practices;
- The firm's system of risk management and controls; and
- Insider trading, the potential misuse and dissemination of material nonpublic information regarding corporate and governmental developments and the effectiveness of the firm's insider trading controls and information barriers.

The firm is cooperating with all such governmental and regulatory investigations and reviews.

**Note 28.**

## Employee Benefit Plans

The firm sponsors various pension plans and certain other postretirement benefit plans, primarily healthcare and life insurance. The firm also provides certain benefits to former or inactive employees prior to retirement.

### Defined Benefit Pension Plans and Postretirement Plans

Employees of certain non-U.S. subsidiaries participate in various defined benefit pension plans. These plans generally provide benefits based on years of credited service and a percentage of eligible compensation. The firm maintains a defined benefit pension plan for certain U.K. employees. As of April 2008, the U.K. defined benefit plan was closed to new participants and frozen for existing participants as of March 31, 2016. The non-U.S. plans do not have a material impact on the firm's consolidated results of operations.

The firm also maintains a defined benefit pension plan for substantially all U.S. employees hired prior to November 1, 2003. As of November 2004, this plan was closed to new participants and frozen for existing participants. In addition, the firm maintains unfunded postretirement benefit plans that provide medical and life insurance for eligible retirees and their dependents covered under these programs. These plans do not have a material impact on the firm's consolidated results of operations.

The firm recognizes the funded status of its defined benefit pension and postretirement plans, measured as the difference between the fair value of the plan assets and the benefit obligation, in the consolidated statements of financial condition. As of December 2018, other assets included $462 million (related to overfunded pension plans) and other liabilities included $344 million, related to these plans. As of December 2017, other assets included $346 million (related to overfunded pension plans) and other liabilities included $606 million, related to these plans.

### Defined Contribution Plans

The firm contributes to employer-sponsored U.S. and non-U.S. defined contribution plans. The firm's contribution to these plans was $240 million for 2018, $257 million for 2017 and $236 million for 2016.

**Note 29.**

## Employee Incentive Plans

The cost of employee services received in exchange for a share-based award is generally measured based on the grant-date fair value of the award. Share-based awards that do not require future service (i.e., vested awards, including awards granted to retirement-eligible employees) are expensed immediately. Share-based awards that require future service are amortized over the relevant service period. Effective January 2017, forfeitures are recorded when they occur. Prior to January 2017, expected forfeitures were estimated and recorded over the vesting period. See Note 3 for information about the adoption of ASU No. 2016-09.

Cash dividend equivalents paid on RSUs are charged to retained earnings. If RSUs that require future service are forfeited, the related dividend equivalents originally charged to retained earnings are reclassified to compensation expense in the period in which forfeiture occurs.

The firm generally issues new shares of common stock upon delivery of share-based awards. In certain cases, primarily related to conflicted employment (as outlined in the applicable award agreements), the firm may cash settle share-based compensation awards accounted for as equity instruments. For these awards, whose terms allow for cash settlement, additional paid-in capital is adjusted to the extent of the difference between the value of the award at the time of cash settlement and the grant-date value of the award.

### Stock Incentive Plan

The firm sponsors a stock incentive plan, The Goldman Sachs Amended and Restated Stock Incentive Plan (2018) (2018 SIP), which provides for grants of RSUs, restricted stock, dividend equivalent rights, incentive stock options, nonqualified stock options, stock appreciation rights, and other share-based awards, each of which may be subject to performance conditions. On May 2, 2018, shareholders approved the 2018 SIP. The 2018 SIP replaced The Goldman Sachs Amended and Restated Stock Incentive Plan (2015) (2015 SIP) previously in effect, and applies to awards granted on or after the date of approval. The 2015 SIP had previously replaced The Goldman Sachs Amended and Restated Stock Incentive Plan (2013) (2013 SIP).

As of December 2018, 68.2 million shares were available for grant under the 2018 SIP. If any shares of common stock underlying awards granted under the 2018 SIP, 2015 SIP or 2013 SIP are not delivered due to forfeiture, termination or cancellation or are surrendered or withheld, those shares will become available to be delivered under the 2018 SIP. Shares available for grant are also subject to adjustment for certain changes in corporate structure as permitted under the 2018 SIP. The 2018 SIP is scheduled to terminate on the date of the annual meeting of shareholders that occurs in 2022.

### Restricted Stock Units

The firm grants RSUs (including RSUs subject to performance conditions) to employees, which are generally valued based on the closing price of the underlying shares on the date of grant after taking into account a liquidity discount for any applicable post-vesting and delivery transfer restrictions. RSUs generally vest and underlying shares of common stock deliver (net of required withholding tax) as outlined in the applicable award agreements. Award agreements generally provide that vesting is accelerated in certain circumstances, such as on retirement, death, disability and conflicted employment. Delivery of the underlying shares of common stock, which generally occurs over a three-year period, is conditioned on the grantees satisfying certain vesting and other requirements outlined in the award agreements.

The table below presents the 2018 activity related to RSUs.

| | Restricted Stock Units Outstanding | | Weighted Average Grant-Date Fair Value of Restricted Stock Units Outstanding | |
|---|---|---|---|---|
| | Future Service Required | No Future Service Required | Future Service Required | No Future Service Required |
| Beginning balance | 4,123,582 | 14,162,828 | $182.50 | $166.30 |
| Granted | **3,887,934** | **5,342,848** | **$220.83** | **$216.05** |
| Forfeited | **(423,154)** | **(195,323)** | **$192.16** | **$167.92** |
| Delivered | **–** | **(9,807,881)** | **$ –** | **$172.40** |
| Vested | **(3,826,523)** | **3,826,523** | **$185.62** | **$185.62** |
| **Ending balance** | **3,761,839** | **13,328,995** | **$217.85** | **$187.27** |

In the table above:

- The weighted average grant-date fair value of RSUs granted was $218.06 during 2018, $206.88 during 2017 and $135.92 during 2016. The fair value of the RSUs granted included a liquidity discount of 11.9% during 2018, 10.7% during 2017 and 10.5% during 2016, to reflect post-vesting and delivery transfer restrictions, generally of up to 4 years.
- The aggregate fair value of awards that vested was $1.79 billion during 2018, $2.14 billion during 2017 and $2.26 billion during 2016.
- The ending balance included restricted stock subject to future service requirements of 1,649 shares as of December 2018 and 3,298 shares as of December 2017.
- The ending balance included RSUs subject to performance conditions and not subject to future service requirements of 174,579 RSUs as of December 2018 and 62,023 RSUs as of December 2017.

In relation to 2018 year-end, during the first quarter of 2019, the firm granted to its employees 11.3 million RSUs, of which 4.0 million RSUs require future service as a condition of delivery for the related shares of common stock. These awards are subject to additional conditions as outlined in the award agreements. Generally, shares underlying these awards, net of required withholding tax, deliver over a three-year period, but are subject to post-vesting and delivery transfer restrictions through January 2024. These grants are not included in the table above.

As of December 2018, there was $448 million of total unrecognized compensation cost related to non-vested share-based compensation arrangements. This cost is expected to be recognized over a weighted average period of 1.85 years.

### Stock Options

Stock options generally vested as outlined in the applicable stock option agreement. In general, options expired on the tenth anniversary of the grant date, although they may have been subject to earlier termination or cancellation under certain circumstances in accordance with the terms of the applicable stock option agreement and the SIP in effect at the time of grant.

There were no options outstanding as of December 2018. There were 2.10 million options outstanding as of December 2017, all of which were exercisable. These options were granted in 2008 with an exercise price of $78.78 and, as of December 2017, had an aggregate intrinsic value of $370 million and a remaining life of 1 year.

During 2018, 2.10 million options were exercised with a weighted average exercise price of $78.78. During 2017, 5.86 million options were exercised with a weighted average exercise price of $139.35. The total intrinsic value of options exercised was $288 million during 2018, $589 million during 2017 and $436 million during 2016.

The table below presents the share-based compensation and the related excess tax benefit.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| Share-based compensation | **$1,850** | $1,812 | $2,170 |
| Excess net tax benefit for options exercised | **$ 64** | $ 139 | $ 79 |
| Excess net tax benefit for share-based awards | **$ 269** | $ 719 | $ 147 |

In the table above, excess net tax benefit for share-based awards includes the net tax benefit on dividend equivalents paid on RSUs and the delivery of common stock underlying share-based awards, as well as the excess net tax benefit for options exercised. Following the adoption of ASU No. 2016-09 in January 2017, such amounts were recognized prospectively in income tax expense. In prior years, such amounts were recognized in additional paid-in capital. See Note 3 for further information about this ASU.

Note 30.

## Parent Company

### Group Inc. — Condensed Statements of Earnings

| | Year Ended December | | |
|---|---|---|---|
| $ in millions | 2018 | 2017 | 2016 |
| **Revenues** | | | |
| Dividends from subsidiaries and other affiliates: | | | |
| Bank | **$ 102** | $ 550 | $ 53 |
| Nonbank | **16,368** | 11,016 | 5,465 |
| Other revenues | **(1,376)** | (384) | 155 |
| Total non-interest revenues | **15,094** | 11,182 | 5,673 |
| Interest income | **6,617** | 4,638 | 4,140 |
| Interest expense | **8,114** | 5,978 | 4,543 |
| Net interest loss | **(1,497)** | (1,340) | (403) |
| Total net revenues | **13,597** | 9,842 | 5,270 |
| **Operating expenses** | | | |
| Compensation and benefits | **299** | 330 | 343 |
| Other expenses | **1,192** | 428 | 332 |
| Total operating expenses | **1,491** | 758 | 675 |
| Pre-tax earnings | **12,106** | 9,084 | 4,595 |
| Provision/(benefit) for taxes | **(1,173)** | 3,404 | (518) |
| Undistributed earnings/(loss) of subsidiaries and other affiliates | **(2,820)** | (1,394) | 2,285 |
| Net earnings | **10,459** | 4,286 | 7,398 |
| Preferred stock dividends | **599** | 601 | 311 |
| **Net earnings applicable to common shareholders** | **$ 9,860** | $ 3,685 | $7,087 |

### Supplemental Disclosures:

In the condensed statements of earnings above, revenues and expenses included the following with subsidiaries and other affiliates:

- Dividends from bank subsidiaries included cash dividends of $76 million for 2018, $525 million for 2017 and $32 million for 2016.
- Dividends from nonbank subsidiaries and other affiliates included cash dividends of $10.78 billion for 2018, $7.98 billion for 2017 and $3.46 billion for 2016.
- Other revenues included $(1.69) billion for 2018, $661 million for 2017 and $49 million for 2016.
- Interest income included $6.33 billion for 2018, $4.65 billion for 2017 and $4.08 billion in 2016.
- Interest expense included $2.39 billion for 2018, $1.05 billion for 2017 and $201 million for 2016.
- Other expenses included $159 million for 2018, $45 million for 2017 and $1 million for 2016.

Group Inc.'s provision for taxes for 2017 included substantially all of the firm's $4.40 billion estimated income tax expense related to Tax Legislation. During 2018, the firm finalized this estimate to reflect the impact of updated information, including subsequent guidance issued by the IRS, resulting in a $487 million income tax benefit, which was primarily included in Group Inc.'s benefit for taxes for 2018. See Note 24 for further information about Tax Legislation.

### Group Inc. — Condensed Statements of Financial Condition

| | As of December | |
|---|---|---|
| $ in millions | 2018 | 2017 |
| **Assets** | | |
| Cash and cash equivalents with third-party banks | **$ 103** | $ 38 |
| Loans to and receivables from subsidiaries: | | |
| Bank | **1,019** | 721 |
| Nonbank (includes $5,461 and $0 at fair value) | **225,471** | 236,050 |
| Investments in subsidiaries and other affiliates: | | |
| Bank | **28,737** | 26,599 |
| Nonbank | **61,481** | 67,279 |
| Financial instruments owned (at fair value) | **13,541** | 10,248 |
| Other assets | **3,653** | 5,898 |
| **Total assets** | **$334,005** | $346,833 |
| **Liabilities and shareholders' equity** | | |
| Payables to subsidiaries | **$ 702** | $ 1,005 |
| Financial instruments sold, but not yet purchased (at fair value) | **281** | 254 |
| Unsecured short-term borrowings: | | |
| With third parties (includes $2,615 and $2,484 at fair value) | **25,060** | 31,871 |
| With subsidiaries | **7,558** | 25,699 |
| Unsecured long-term borrowings: | | |
| With third parties (includes $16,395 and $18,207 at fair value) | **183,121** | 190,502 |
| With subsidiaries | **23,343** | 11,068 |
| Other liabilities | **3,755** | 4,191 |
| Total liabilities | **243,820** | 264,590 |
| **Commitments, contingencies and guarantees** | | |
| **Shareholders' equity** | | |
| Preferred stock | **11,203** | 11,853 |
| Common stock | **9** | 9 |
| Share-based awards | **2,845** | 2,777 |
| Additional paid-in capital | **54,005** | 53,357 |
| Retained earnings | **100,100** | 91,519 |
| Accumulated other comprehensive income/(loss) | **693** | (1,880) |
| Stock held in treasury, at cost | **(78,670)** | (75,392) |
| Total shareholders' equity | **90,185** | 82,243 |
| **Total liabilities and shareholders' equity** | **$334,005** | $346,833 |

### Supplemental Disclosures:

Goldman Sachs Funding LLC (Funding IHC), a wholly-owned, direct subsidiary of Group Inc., has provided Group Inc. with a committed line of credit that allows Group Inc. to draw sufficient funds to meet its cash needs in the ordinary course of business.

Financial instruments owned included derivative contracts with subsidiaries of $683 million as of December 2018 and $570 million as of December 2017.

Financial instruments sold, but not yet purchased included derivative contracts with subsidiaries of $280 million as of December 2018 and $218 million as of December 2017.

As of December 2018, unsecured long-term borrowings with subsidiaries by maturity date are $22.56 billion in 2020, $91 million in 2021, $74 million in 2022, $66 million in 2023 and $554 million in 2024-thereafter.

## Group Inc. — Condensed Statements of Cash Flows

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Cash flows from operating activities** | | | |
| Net earnings | **$ 10,459** | $ 4,286 | $ 7,398 |
| Adjustments to reconcile net earnings to net cash provided by operating activities: | | | |
| Undistributed (earnings)/loss of subsidiaries and other affiliates | **2,820** | 1,394 | (2,285) |
| Depreciation and amortization | **51** | 56 | 52 |
| Deferred income taxes | **(2,817)** | 4,358 | 134 |
| Share-based compensation | **105** | 152 | 193 |
| Loss/(gain) related to extinguishment of unsecured borrowings | **(160)** | (114) | 3 |
| Changes in operating assets and liabilities: | | | |
| Financial instruments owned (excluding available-for-sale securities) | **(1,597)** | (309) | (1,580) |
| Financial instruments sold, but not yet purchased | **27** | (521) | 332 |
| Other, net | **1,804** | (757) | 337 |
| Net cash provided by operating activities | **10,692** | 8,545 | 4,584 |
| **Cash flows from investing activities** | | | |
| Purchase of property, leasehold improvements and equipment | **(63)** | (66) | (79) |
| Repayments/(issuances) of short-term loans to subsidiaries, net | **10,829** | (14,415) | (3,994) |
| Issuance of term loans to subsidiaries | **(30,336)** | (42,234) | (28,498) |
| Repayments of term loans by subsidiaries | **25,956** | 22,039 | 32,265 |
| Purchase of investments | **(3,140)** | (6,491) | – |
| Capital distributions from/(contributions to) subsidiaries, net | **1,807** | 388 | (3,265) |
| Net cash provided by/(used for) investing activities | **5,053** | (40,779) | (3,571) |
| **Cash flows from financing activities** | | | |
| Unsecured short-term borrowings, net: | | | |
| With third parties | **(1,541)** | (424) | (178) |
| With subsidiaries | **(998)** | 23,078 | 2,290 |
| Proceeds from issuance of long-term borrowings | **26,157** | 43,917 | 40,708 |
| Repayment of long-term borrowings, including the current portion | **(32,429)** | (27,028) | (33,314) |
| Purchase of APEX, senior guaranteed securities and trust preferred securities | **(35)** | (237) | (1,171) |
| Preferred stock redemption | **(650)** | (850) | – |
| Common stock repurchased | **(3,294)** | (6,772) | (6,078) |
| Settlement of share-based awards in satisfaction of withholding tax requirements | **(1,118)** | (2,223) | (1,128) |
| Dividends and dividend equivalents paid on common stock, preferred stock and share-based awards | **(1,810)** | (1,769) | (1,706) |
| Proceeds from issuance of preferred stock, net of issuance costs | **–** | 1,495 | 1,303 |
| Proceeds from issuance of common stock, including exercise of share-based awards | **38** | 7 | 6 |
| Cash settlement of share-based awards | **–** | (3) | – |
| Net cash provided by/(used for) financing activities | **(15,680)** | 29,191 | 732 |
| Net increase/(decrease) in cash and cash equivalents | **65** | (3,043) | 1,745 |
| Cash and cash equivalents, beginning balance | **38** | 3,081 | 1,336 |
| **Cash and cash equivalents, ending balance** | **$ 103** | $ 38 | $ 3,081 |

**Supplemental Disclosures:**

Cash payments for interest, net of capitalized interest, were $9.83 billion for 2018, $6.31 billion for 2017 and $4.91 billion for 2016, and included $3.05 billion for 2018, $160 million for 2017 and $187 million for 2016 of payments to subsidiaries.

Cash payments/(refunds) for income taxes, net, were $(98) million for 2018, $297 million for 2017 and $61 million for 2016.

Cash flows related to common stock repurchased includes common stock repurchased in the prior period for which settlement occurred during the current period and excludes common stock repurchased during the current period for which settlement occurred in the following period.

*Non-cash activities during the year ended December 2018:*

- Group Inc. restructured funding for Goldman Sachs Group (UK) Ltd. and Goldman Sachs International, both wholly-owned subsidiaries of Group Inc., which resulted in a net increase in loans to subsidiaries of $5.71 billion and a decrease in equity interest of $5.71 billion.
- Group Inc. exchanged $150 million of liabilities and $46 million of related deferred tax assets for $104 million of equity interest in GS&Co., a wholly owned subsidiary of Group Inc.
- Group Inc. exchanged $35 million of Trust Preferred Securities and common beneficial interests for $35 million of certain of the Group Inc.'s junior subordinated debt.

*Non-cash activities during the year ended December 2017:*

- Group Inc. exchanged $84.00 billion of certain loans to and receivables from subsidiaries for an $84.00 billion unsecured subordinated note from Funding IHC (included in loans to and receivables from subsidiaries).
- Group Inc. exchanged $750 million of its equity interest in Goldman Sachs (UK) L.L.C. (GS UK), a wholly-owned subsidiary of Group Inc., for a $750 million loan to GS UK.
- Group Inc. exchanged $237 million of Trust Preferred Securities and common beneficial interests for $248 million of Group Inc.'s junior subordinated debt.

*Non-cash activities during the year ended December 2016:*

- Group Inc. exchanged $1.04 billion of APEX for $1.31 billion of Series E and Series F Preferred Stock. See Note 19 for further information.
- Group Inc. exchanged $127 million of senior guaranteed trust securities for $124 million of Group Inc.'s junior subordinated debt.

## Quarterly Results (unaudited)

The tables below present the unaudited quarterly results.

| $ in millions, except per share amounts | Three Months Ended December 2018 | September 2018 | June 2018 | March 2018 |
|---|---|---|---|---|
| Non-interest revenues | $ 7,089 | $7,964 | $8,634 | $ 9,162 |
| Interest income | 5,468 | 5,061 | 4,920 | 4,230 |
| Interest expense | 4,477 | 4,205 | 3,918 | 3,312 |
| Net interest income | 991 | 856 | 1,002 | 918 |
| Total net revenues | 8,080 | 8,820 | 9,636 | 10,080 |
| Provision for credit losses | 222 | 174 | 234 | 44 |
| Operating expenses | 5,150 | 5,568 | 6,126 | 6,617 |
| Pre-tax earnings | 2,708 | 3,078 | 3,276 | 3,419 |
| Provision for taxes | 170 | 554 | 711 | 587 |
| Net earnings | 2,538 | 2,524 | 2,565 | 2,832 |
| Preferred stock dividends | 216 | 71 | 217 | 95 |
| **Net earnings applicable to common shareholders** | **$ 2,322** | **$2,453** | **$2,348** | **$ 2,737** |
| **Earnings per common share:** | | | | |
| Basic | $ 6.11 | $ 6.35 | $ 6.04 | $ 7.02 |
| Diluted | $ 6.04 | $ 6.28 | $ 5.98 | $ 6.95 |
| Dividends declared per common share | $ 0.80 | $ 0.80 | $ 0.80 | $ 0.75 |

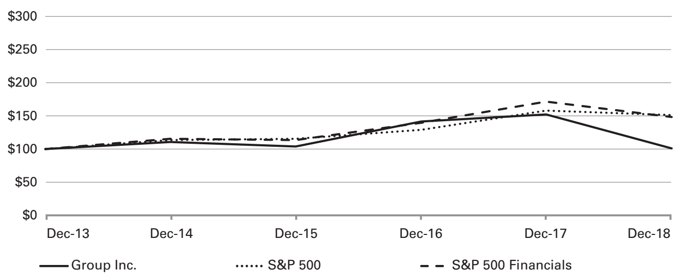
| $ in millions, except per share amounts | Three Months Ended December 2017 | September 2017 | June 2017 | March 2017 |
|---|---|---|---|---|
| Non-interest revenues | $ 7,226 | $7,660 | $7,314 | $ 7,598 |
| Interest income | 3,736 | 3,411 | 3,220 | 2,746 |
| Interest expense | 2,838 | 2,681 | 2,432 | 2,230 |
| Net interest income | 898 | 730 | 788 | 516 |
| Total net revenues | 8,124 | 8,390 | 8,102 | 8,114 |
| Provision for credit losses | 290 | 64 | 215 | 88 |
| Operating expenses | 4,726 | 5,350 | 5,378 | 5,487 |
| Pre-tax earnings | 3,108 | 2,976 | 2,509 | 2,539 |
| Provision for taxes | 5,036 | 848 | 678 | 284 |
| Net earnings/(loss) | (1,928) | 2,128 | 1,831 | 2,255 |
| Preferred stock dividends | 215 | 93 | 200 | 93 |
| Net earnings/(loss) applicable to common shareholders | $(2,143) | $2,035 | $1,631 | $ 2,162 |
| Earnings/(loss) per common share: | | | | |
| Basic | $ (5.51) | $ 5.09 | $ 4.00 | $ 5.23 |
| Diluted | $ (5.51) | $ 5.02 | $ 3.95 | $ 5.15 |
| Dividends declared per common share | $ 0.75 | $ 0.75 | $ 0.75 | $ 0.65 |

In the table above:

- These quarterly results were prepared in accordance with U.S. GAAP and reflect all adjustments that are, in the opinion of management, necessary for a fair statement of the results. These adjustments are of a normal, recurring nature. The timing and magnitude of changes in the firm's discretionary compensation accruals (included in operating expenses) can have a significant effect on results in a given quarter.
- Provision for credit losses, previously reported in total net revenues, is now reported as a separate line item in the consolidated statements of earnings. Previously reported amounts have been conformed to the current presentation.

## Common Stock Performance

The graph and table below compare the performance of an investment in the firm's common stock from December 31, 2013 (the last trading day before the firm's 2014 fiscal year) through December 31, 2018, with the S&P 500 Index (S&P 500) and the S&P 500 Financials Index (S&P 500 Financials).




| | As of December 2013 | 2014 | 2015 | 2016 | 2017 | **2018** |
|---|---|---|---|---|---|---|
| Group Inc. | $100.00 | $110.78 | $104.37 | $140.80 | $151.70 | **$100.85** |
| S&P 500 | $100.00 | $113.68 | $115.24 | $129.01 | $157.16 | **$150.26** |
| S&P 500 Financials | $100.00 | $115.18 | $113.38 | $139.18 | $169.99 | **$147.82** |

The graph and table above assume $100 was invested on December 31, 2013 in each of the firm's common stock, the S&P 500 and the S&P 500 Financials, and the dividends were reinvested on the date of payment without payment of any commissions. The performance shown represents past performance and should not be considered an indication of future performance.

## Selected Financial Data

| | Year Ended or as of December | | | | |
|---|---|---|---|---|---|
| | **2018** | 2017 | 2016 | 2015 | 2014 |
| **Income statement data** *($ in millions)* | | | | | |
| Non-interest revenues | **$ 32,849** | $ 29,798 | $ 28,203 | $ 31,045 | $ 30,602 |
| Interest income | **19,679** | 13,113 | 9,691 | 8,452 | 9,604 |
| Interest expense | **15,912** | 10,181 | 7,104 | 5,388 | 5,557 |
| Net interest income | **3,767** | 2,932 | 2,587 | 3,064 | 4,047 |
| Total net revenues | **36,616** | 32,730 | 30,790 | 34,109 | 34,649 |
| Provision for credit losses | **674** | 657 | 182 | 289 | 121 |
| Operating expenses | **23,461** | 20,941 | 20,304 | 25,042 | 22,171 |
| Pre-tax earnings | **$ 12,481** | $ 11,132 | $ 10,304 | $ 8,778 | $ 12,357 |
| **Balance sheet data** *($ in millions)* | | | | | |
| Total assets | **$931,796** | $916,776 | $860,165 | $861,395 | $855,842 |
| Deposits | **$158,257** | $138,604 | $124,098 | $ 97,519 | $ 82,880 |
| Other secured financings (long-term) | **$ 11,878** | $ 9,892 | $ 8,405 | $ 10,520 | $ 7,249 |
| Unsecured long-term borrowings | **$224,149** | $217,687 | $189,086 | $175,422 | $167,302 |
| Total liabilities | **$841,611** | $834,533 | $773,272 | $774,667 | $773,045 |
| Total shareholders' equity | **$ 90,185** | $ 82,243 | $ 86,893 | $ 86,728 | $ 82,797 |
| **Common share data** *(in millions, except per share amounts)* | | | | | |
| Earnings per common share: | | | | | |
| Basic | **$ 25.53** | $ 9.12 | $ 16.53 | $ 12.35 | $ 17.55 |
| Diluted | **$ 25.27** | $ 9.01 | $ 16.29 | $ 12.14 | $ 17.07 |
| Dividends declared per common share | **$ 3.15** | $ 2.90 | $ 2.60 | $ 2.55 | $ 2.25 |
| Book value per common share | **$ 207.36** | $ 181.00 | $ 182.47 | $ 171.03 | $ 163.01 |
| Basic shares | **380.9** | 388.9 | 414.8 | 441.6 | 451.5 |
| Average common shares: | | | | | |
| Basic | **385.4** | 401.6 | 427.4 | 448.9 | 458.9 |
| Diluted | **390.2** | 409.1 | 435.1 | 458.6 | 473.2 |
| **Selected data** *(unaudited)* | | | | | |
| ROE | **13.3%** | 4.9% | 9.4% | 7.4% | 11.2% |
| Headcount: | | | | | |
| Americas | **19,700** | 18,100 | 17,400 | 18,000 | 16,600 |
| Non-Americas | **16,900** | 15,500 | 15,000 | 16,000 | 15,000 |
| Total headcount | **36,600** | 33,600 | 32,400 | 34,000 | 31,600 |
| AUS by asset class *($ in billions)* | | | | | |
| Alternative investments | **$ 167** | $ 168 | $ 154 | $ 148 | $ 143 |
| Equity | **301** | 321 | 266 | 252 | 236 |
| Fixed income | **677** | 660 | 601 | 546 | 516 |
| Long-term AUS | **1,145** | 1,149 | 1,021 | 946 | 895 |
| Liquidity products | **397** | 345 | 358 | 306 | 283 |
| Total AUS | **$ 1,542** | $ 1,494 | $ 1,379 | $ 1,252 | $ 1,178 |

In the table above:

- Provision for credit losses, previously reported in total net revenues, is now reported as a separate line item in the consolidated statements of earnings. Previously reported amounts have been conformed to the current presentation.
- The impact of adopting ASU No. 2015-03 was a reduction to both total assets and liabilities of $398 million as of December 2014. See Note 3 to the consolidated financial statements in Part II, Item 8 of the firm's Annual Report on Form 10-K for the year ended December 31, 2015 for further information.
- Basic shares represent common shares outstanding and restricted stock units granted to employees with no future service requirements.
- Headcount consists of employees, and excludes consultants and temporary staff previously reported as total staff.

## Statistical Disclosures

### Distribution of Assets, Liabilities and Shareholders' Equity

The tables below present information about average balances, interest and average interest rates.

| | Average Balance for the Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Assets** | | | |
| U.S. | **$ 65,888** | $ 66,838 | $ 72,132 |
| Non-U.S. | **52,773** | 42,353 | 33,342 |
| **Total deposits with banks** | **118,661** | 109,191 | 105,474 |
| U.S. | **161,783** | 159,829 | 177,930 |
| Non-U.S. | **140,411** | 133,156 | 129,150 |
| **Total collateralized agreements** | **302,194** | 292,985 | 307,080 |
| U.S. | **168,253** | 163,344 | 147,862 |
| Non-U.S. | **119,602** | 112,299 | 102,387 |
| **Total financial instruments owned** | **287,855** | 275,643 | 250,249 |
| U.S. | **67,418** | 50,742 | 43,367 |
| Non-U.S. | **6,494** | 4,767 | 4,609 |
| **Total loans receivable** | **73,912** | 55,509 | 47,976 |
| U.S. | **44,201** | 40,642 | 37,525 |
| Non-U.S. | **43,261** | 40,314 | 32,732 |
| **Total other interest-earning assets** | **87,462** | 80,956 | 70,257 |
| **Total interest-earning assets** | **870,084** | 814,284 | 781,036 |
| Cash and due from banks | **11,380** | 11,056 | 13,985 |
| Other non-interest-earning assets | **86,117** | 84,264 | 91,875 |
| **Total assets** | **$967,581** | $909,604 | $886,896 |
| **Liabilities** | | | |
| U.S. | **$117,121** | $101,109 | $ 97,255 |
| Non-U.S. | **30,071** | 24,356 | 17,605 |
| **Total interest-bearing deposits** | **147,192** | 125,465 | 114,860 |
| U.S. | **59,129** | 56,614 | 52,388 |
| Non-U.S. | **45,747** | 39,029 | 31,936 |
| **Total collateralized financings** | **104,876** | 95,643 | 84,324 |
| U.S. | **33,193** | 34,422 | 36,273 |
| Non-U.S. | **49,295** | 41,507 | 35,797 |
| **Total financial instruments sold, but not yet purchased** | **82,488** | 75,929 | 72,070 |
| U.S. | **40,360** | 38,615 | 43,684 |
| Non-U.S. | **16,909** | 13,318 | 13,656 |
| **Total short-term borrowings** | **57,269** | 51,933 | 57,340 |
| U.S. | **212,200** | 199,569 | 182,808 |
| Non-U.S. | **24,173** | 15,000 | 10,488 |
| **Total long-term borrowings** | **236,373** | 214,569 | 193,296 |
| U.S. | **124,657** | 135,804 | 147,177 |
| Non-U.S. | **63,428** | 60,986 | 59,852 |
| **Total other interest-bearing liabilities** | **188,085** | 196,790 | 207,029 |
| **Total interest-bearing liabilities** | **816,283** | 760,329 | 728,919 |
| Non-interest-bearing deposits | **4,273** | 3,630 | 2,996 |
| Other non-interest-bearing liabilities | **61,787** | 59,686 | 68,323 |
| **Total liabilities** | **882,343** | 823,645 | 800,238 |
| **Shareholders' equity** | | | |
| Preferred stock | **11,253** | 11,238 | 11,304 |
| Common stock | **73,985** | 74,721 | 75,354 |
| **Total shareholders' equity** | **85,238** | 85,959 | 86,658 |
| **Total liabilities and shareholders' equity** | **$967,581** | $909,604 | $886,896 |
| **Percentage of interest-earning assets and interest-bearing liabilities attributable to non-U.S. operations** | | | |
| Assets | **41.67%** | 40.88% | 38.69% |
| Liabilities | **28.13%** | 25.54% | 23.23% |

# Supplemental Financial Information

| | Interest for the Year Ended December | | |
|---|---|---|---|
| $ in millions | **2018** | 2017 | 2016 |
| **Assets** | | | |
| U.S. | **$ 1,247** | $ 760 | $ 382 |
| Non-U.S. | **171** | 59 | 70 |
| **Total deposits with banks** | **1,418** | 819 | 452 |
| U.S. | **3,340** | 1,335 | 361 |
| Non-U.S. | **512** | 326 | 330 |
| **Total collateralized agreements** | **3,852** | 1,661 | 691 |
| U.S. | **4,432** | 3,958 | 3,762 |
| Non-U.S. | **2,462** | 1,946 | 1,682 |
| **Total financial instruments owned** | **6,894** | 5,904 | 5,444 |
| U.S. | **3,734** | 2,386 | 1,620 |
| Non-U.S. | **414** | 292 | 223 |
| **Total loans receivable** | **4,148** | 2,678 | 1,843 |
| U.S. | **2,389** | 1,523 | 914 |
| Non-U.S. | **978** | 528 | 347 |
| **Total other interest-earning assets** | **3,367** | 2,051 | 1,261 |
| **Total interest-earning assets** | **$19,679** | $13,113 | $9,691 |
| **Liabilities** | | | |
| U.S. | **$ 2,317** | $ 1,205 | $ 780 |
| Non-U.S. | **289** | 175 | 98 |
| **Total interest-bearing deposits** | **2,606** | 1,380 | 878 |
| U.S. | **1,760** | 735 | 325 |
| Non-U.S. | **291** | 128 | 117 |
| **Total collateralized financings** | **2,051** | 863 | 442 |
| U.S. | **803** | 682 | 607 |
| Non-U.S. | **751** | 706 | 644 |
| **Total financial instruments sold, but not yet purchased** | **1,554** | 1,388 | 1,251 |
| U.S. | **672** | 660 | 401 |
| Non-U.S. | **23** | 38 | 45 |
| **Total short-term borrowings** | **695** | 698 | 446 |
| U.S. | **5,474** | 4,539 | 4,175 |
| Non-U.S. | **81** | 60 | 67 |
| **Total long-term borrowings** | **5,555** | 4,599 | 4,242 |
| U.S. | **3,245** | 991 | (658) |
| Non-U.S. | **206** | 262 | 503 |
| **Total other interest-bearing liabilities** | **3,451** | 1,253 | (155) |
| **Total interest-bearing liabilities** | **$15,912** | $10,181 | $7,104 |
| **Net interest income** | | | |
| U.S. | **$ 871** | $ 1,150 | $1,409 |
| Non-U.S. | **2,896** | 1,782 | 1,178 |
| **Net interest income** | **$ 3,767** | $ 2,932 | $2,587 |

| | Average Rate for the Year Ended December | | |
|---|---|---|---|
| | **2018** | 2017 | 2016 |
| **Assets** | | | |
| U.S. | **1.89%** | 1.14% | 0.53% |
| Non-U.S. | **0.32%** | 0.14% | 0.21% |
| **Total deposits with banks** | **1.20%** | 0.75% | 0.43% |
| U.S. | **2.06%** | 0.84% | 0.20% |
| Non-U.S. | **0.36%** | 0.24% | 0.26% |
| **Total collateralized agreements** | **1.27%** | 0.57% | 0.23% |
| U.S. | **2.63%** | 2.42% | 2.54% |
| Non-U.S. | **2.06%** | 1.73% | 1.64% |
| **Total financial instruments owned** | **2.39%** | 2.14% | 2.18% |
| U.S. | **5.54%** | 4.70% | 3.74% |
| Non-U.S. | **6.38%** | 6.13% | 4.84% |
| **Total loans receivable** | **5.61%** | 4.82% | 3.84% |
| U.S. | **5.40%** | 3.75% | 2.44% |
| Non-U.S. | **2.26%** | 1.31% | 1.06% |
| **Total other interest-earning assets** | **3.85%** | 2.53% | 1.79% |
| **Total interest-earning assets** | **2.26%** | 1.61% | 1.24% |
| **Liabilities** | | | |
| U.S. | **1.98%** | 1.19% | 0.80% |
| Non-U.S. | **0.96%** | 0.72% | 0.56% |
| **Total interest-bearing deposits** | **1.77%** | 1.10% | 0.76% |
| U.S. | **2.98%** | 1.30% | 0.62% |
| Non-U.S. | **0.64%** | 0.33% | 0.37% |
| **Total collateralized financings** | **1.96%** | 0.90% | 0.52% |
| U.S. | **2.42%** | 1.98% | 1.67% |
| Non-U.S. | **1.52%** | 1.70% | 1.80% |
| **Total financial instruments sold, but not yet purchased** | **1.88%** | 1.83% | 1.74% |
| U.S. | **1.67%** | 1.71% | 0.92% |
| Non-U.S. | **0.14%** | 0.29% | 0.33% |
| **Total short-term borrowings** | **1.21%** | 1.34% | 0.78% |
| U.S. | **2.58%** | 2.27% | 2.28% |
| Non-U.S. | **0.34%** | 0.40% | 0.64% |
| **Total long-term borrowings** | **2.35%** | 2.14% | 2.19% |
| U.S. | **2.60%** | 0.73% | (0.45)% |
| Non-U.S. | **0.32%** | 0.43% | 0.84% |
| **Total other interest-bearing liabilities** | **1.83%** | 0.64% | (0.07)% |
| **Total interest-bearing liabilities** | **1.95%** | 1.34% | 0.97% |
| **Interest rate spread** | **0.31%** | 0.27% | 0.27% |
| U.S. | **0.17%** | 0.24% | 0.29% |
| Non-U.S. | **0.80%** | 0.54% | 0.39% |
| **Net yield on interest-earning assets** | **0.43%** | 0.36% | 0.33% |

In the tables above:

- Assets, liabilities and interest are classified as U.S. and non-U.S. based on the location of the entity in which the assets and liabilities are held.
- Derivative instruments and commodities are included in other non-interest-earning assets and other non-interest-bearing liabilities.
- Total other interest-earning assets primarily consists of certain receivables from customers and counterparties.
- Collateralized financings consists of repurchase agreements and securities loaned.
- Substantially all of the total other interest-bearing liabilities consists of certain payables to customers and counterparties.
- Interest rates for borrowings include the effects of interest rate swaps accounted for as hedges.

## Changes in Net Interest Income, Volume and Rate Analysis

The tables below present the effect on net interest income of volume and rate changes. In this analysis, changes due to volume/rate variance have been allocated to volume.

| | Year Ended December 2018 versus December 2017 | | |
|---|---|---|---|
| | Increase (decrease) due to change in: | | |
| *$ in millions* | **Volume** | **Rate** | **Net Change** |
| **Interest-earning assets** | | | |
| U.S. | **$ (18)** | **$ 505** | **$ 487** |
| Non-U.S. | **34** | **78** | **112** |
| **Total deposits with banks** | **16** | **583** | **599** |
| U.S. | **40** | **1,965** | **2,005** |
| Non-U.S. | **26** | **160** | **186** |
| **Total collateralized agreements** | **66** | **2,125** | **2,191** |
| U.S. | **129** | **345** | **474** |
| Non-U.S. | **150** | **366** | **516** |
| **Total financial instruments owned** | **279** | **711** | **990** |
| U.S. | **924** | **424** | **1,348** |
| Non-U.S. | **110** | **12** | **122** |
| **Total loans receivable** | **1,034** | **436** | **1,470** |
| U.S. | **192** | **674** | **866** |
| Non-U.S. | **67** | **383** | **450** |
| **Total other interest-earning assets** | **259** | **1,057** | **1,316** |
| **Change in interest income** | **1,654** | **4,912** | **6,566** |
| **Interest-bearing liabilities** | | | |
| U.S. | **317** | **795** | **1,112** |
| Non-U.S. | **55** | **59** | **114** |
| **Total interest-bearing deposits** | **372** | **854** | **1,226** |
| U.S. | **75** | **950** | **1,025** |
| Non-U.S. | **43** | **120** | **163** |
| **Total collateralized financings** | **118** | **1,070** | **1,188** |
| U.S. | **(30)** | **151** | **121** |
| Non-U.S. | **119** | **(74)** | **45** |
| **Total financial instruments sold, but not yet purchased** | **89** | **77** | **166** |
| U.S. | **29** | **(17)** | **12** |
| Non-U.S. | **5** | **(20)** | **(15)** |
| **Total short-term borrowings** | **34** | **(37)** | **(3)** |
| U.S. | **326** | **609** | **935** |
| Non-U.S. | **31** | **(10)** | **21** |
| **Total long-term borrowings** | **357** | **599** | **956** |
| U.S. | **(290)** | **2,544** | **2,254** |
| Non-U.S. | **8** | **(64)** | **(56)** |
| **Total other interest-bearing liabilities** | **(282)** | **2,480** | **2,198** |
| **Change in interest expense** | **688** | **5,043** | **5,731** |
| **Change in net interest income** | **$ 966** | **$ (131)** | **$ 835** |

| | Year Ended December 2017 versus December 2016 | | |
|---|---|---|---|
| | Increase (decrease) due to change in: | | |
| *$ in millions* | Volume | Rate | Net Change |
| **Interest-earning assets** | | | |
| U.S. | $ (60) | $ 438 | $ 378 |
| Non-U.S. | 13 | (24) | (11) |
| **Total deposits with banks** | (47) | 414 | 367 |
| U.S. | (151) | 1,125 | 974 |
| Non-U.S. | 10 | (14) | (4) |
| **Total collateralized agreements** | (141) | 1,111 | 970 |
| U.S. | 375 | (179) | 196 |
| Non-U.S. | 172 | 92 | 264 |
| **Total financial instruments owned** | 547 | (87) | 460 |
| U.S. | 347 | 419 | 766 |
| Non-U.S. | 10 | 59 | 69 |
| **Total loans receivable** | 357 | 478 | 835 |
| U.S. | 117 | 492 | 609 |
| Non-U.S. | 99 | 82 | 181 |
| **Total other interest-earning assets** | 216 | 574 | 790 |
| **Change in interest income** | 932 | 2,490 | 3,422 |
| **Interest-bearing liabilities** | | | |
| U.S. | 46 | 379 | 425 |
| Non-U.S. | 49 | 28 | 77 |
| **Total interest-bearing deposits** | 95 | 407 | 502 |
| U.S. | 55 | 355 | 410 |
| Non-U.S. | 23 | (12) | 11 |
| **Total collateralized financings** | 78 | 343 | 421 |
| U.S. | (37) | 112 | 75 |
| Non-U.S. | 97 | (35) | 62 |
| **Total financial instruments sold, but not yet purchased** | 60 | 77 | 137 |
| U.S. | (87) | 346 | 259 |
| Non-U.S. | (1) | (6) | (7) |
| **Total short-term borrowings** | (88) | 340 | 252 |
| U.S. | 381 | (17) | 364 |
| Non-U.S. | 18 | (25) | (7) |
| **Total long-term borrowings** | 399 | (42) | 357 |
| U.S. | (83) | 1,732 | 1,649 |
| Non-U.S. | 5 | (246) | (241) |
| **Total other interest-bearing liabilities** | (78) | 1,486 | 1,408 |
| **Change in interest expense** | 466 | 2,611 | 3,077 |
| **Change in net interest income** | $ 466 | $ (121) | $ 345 |

## Deposits

The table below presents information about interest-bearing deposits.

| | Year Ended December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Average balances** | | | |
| **U.S.** | | | |
| Savings and demand | **$ 76,428** | $ 68,819 | $ 59,357 |
| Time | **40,693** | 32,290 | 37,898 |
| Total U.S. | **117,121** | 101,109 | 97,255 |
| **Non-U.S.** | | | |
| Demand | **9,579** | 8,443 | 8,041 |
| Time | **20,492** | 15,913 | 9,564 |
| Total non-U.S. | **30,071** | 24,356 | 17,605 |
| **Total** | **$147,192** | $125,465 | $114,860 |
| **Average interest rates** | | | |
| **U.S.** | | | |
| Savings and demand | **1.85%** | 0.98% | 0.56% |
| Time | **2.21%** | 1.64% | 1.18% |
| Total U.S. | **1.98%** | 1.19% | 0.80% |
| **Non-U.S.** | | | |
| Demand | **1.29%** | 0.68% | 0.29% |
| Time | **0.81%** | 0.75% | 0.78% |
| Total non-U.S. | **0.96%** | 0.72% | 0.56% |
| **Total** | **1.77%** | 1.10% | 0.76% |

In the table above, deposits are classified as U.S. and non-U.S. based on the location of the entity in which such deposits are held.

As of December 2018, deposits in U.S. offices included $6.79 billion and non-U.S. offices included $17.12 billion of time deposits that were greater than $100,000.

The table below presents maturities of these time deposits held in U.S. offices.

| *$ in millions* | As of December 2018 |
|---|---|
| 3 months or less | **$1,137** |
| 3 to 6 months | **1,306** |
| 6 to 12 months | **3,047** |
| Greater than 12 months | **1,302** |
| **Total** | **$6,792** |

## Short-Term and Other Borrowed Funds

The table below presents information about securities loaned and repurchase agreements, and short-term borrowings.

| | As of December | | |
|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 |
| **Securities loaned and repurchase agreements** | | | |
| Amounts outstanding at year-end | **$ 90,531** | $ 99,511 | $79,340 |
| Average outstanding during the year | **$104,876** | $ 95,643 | $84,324 |
| Maximum month-end outstanding | **$123,805** | $103,359 | $89,142 |
| **Weighted average interest rate** | | | |
| During the year | **1.96%** | 0.90% | 0.52% |
| At year-end | **3.31%** | 1.16% | 0.44% |
| **Short-term borrowings** | | | |
| Amounts outstanding at year-end | **$ 50,057** | $ 61,818 | $52,383 |
| Average outstanding during the year | **$ 57,269** | $ 51,933 | $57,340 |
| Maximum month-end outstanding | **$ 63,743** | $ 61,818 | $61,840 |
| **Weighted average interest rate** | | | |
| During the year | **1.21%** | 1.34% | 0.78% |
| At year-end | **1.30%** | 1.22% | 0.94% |

In the table above:

- These borrowings generally mature within one year of the financial statement date and include borrowings that are redeemable at the option of the holder within one year of the financial statement date.
- Amounts outstanding at year-end for short-term borrowings included short-term secured financings of $9.56 billion as of December 2018, $14.90 billion as of December 2017 and $13.12 billion as of December 2016.
- The weighted average interest rates for these borrowings include the effect of hedging activities.

## Loan Portfolio

The table below presents information about loans receivable.

| | As of December | | | | |
|---|---|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 | 2015 | 2014 |
| **U.S.** | | | | | |
| Corporate loans | **$34,256** | $28,622 | $23,821 | $19,909 | $14,020 |
| PWM loans | **15,100** | 14,489 | 12,386 | 12,824 | 10,989 |
| Commercial real estate loans | **9,476** | 6,150 | 2,813 | 3,186 | 1,876 |
| Residential real estate loans | **7,244** | 6,176 | 3,777 | 2,187 | 311 |
| Consumer loans | **4,536** | 1,912 | 208 | – | – |
| Other loans | **3,616** | 3,233 | 2,664 | 3,495 | 821 |
| **Total U.S.** | **74,228** | 60,582 | 45,669 | 41,601 | 28,017 |
| **Non-U.S.** | | | | | |
| Corporate loans | **3,027** | 2,127 | 1,016 | 831 | 290 |
| PWM loans | **2,119** | 2,102 | 1,442 | 1,137 | 300 |
| Commercial real estate loans | **1,965** | 1,837 | 1,948 | 2,085 | 549 |
| Residential real estate loans | **40** | 58 | 88 | 129 | 10 |
| Other loans | **277** | 30 | 18 | 38 | – |
| **Total non-U.S.** | **7,428** | 6,154 | 4,512 | 4,220 | 1,149 |
| **Total loans receivable, gross** | **81,656** | 66,736 | 50,181 | 45,821 | 29,166 |
| **Allowance for loan losses** | | | | | |
| U.S. | **848** | 604 | 476 | 381 | 205 |
| Non-U.S. | **218** | 199 | 33 | 33 | 23 |
| **Total allowance for loan losses** | **1,066** | 803 | 509 | 414 | 228 |
| **Total loans receivable** | **$80,590** | $65,933 | $49,672 | $45,407 | $28,938 |

In the table above, loans receivable are classified as U.S. and non-U.S. based on the location of the entity in which such loans are held.

## Allowance for Loan Losses

The table below presents changes in the allowance for loan losses.

| | Year Ended December | | | | |
|---|---|---|---|---|---|
| *$ in millions* | **2018** | 2017 | 2016 | 2015 | 2014 |
| Beginning balance | **$ 803** | $ 509 | $414 | $228 | $139 |
| Net charge-offs | **(337)** | (203) | (8) | (1) | (3) |
| Provision | **654** | 574 | 138 | 187 | 92 |
| Other | **(54)** | (77) | (35) | – | – |
| **Ending balance** | **$1,066** | $ 803 | $509 | $414 | $228 |

In the table above:

- Allowance for loan losses as of 2018 primarily related to corporate loans and consumer loans that were held in entities located in the U.S.
- Allowance for loan losses as of 2017 and earlier primarily related to corporate loans and loans extended to PWM clients that were held in entities located in the U.S.
- Net charge-offs for 2018 were primarily related to consumer loans held in entities located in the U.S. and commercial real estate PCI loans held in entities located outside of the U.S.
- Net charge-offs for 2017 and earlier were primarily related to corporate loans held in entities located in the U.S.

## Maturities and Sensitivity to Changes in Interest Rates

The table below presents gross loans receivable by tenor and a distribution of such loans receivable between fixed and floating interest rates.

| | Maturities and Sensitivity to Changes in Interest Rates as of December 2018 | | | |
|---|---|---|---|---|
| $ in millions | Less than 1 year | 1 - 5 years | Greater than 5 years | Total |
| **U.S.** | | | | |
| Corporate loans | **$ 4,241** | **$24,907** | **$ 5,108** | **$34,256** |
| PWM loans | **12,172** | **2,910** | **18** | **15,100** |
| Commercial real estate loans | **1,458** | **7,368** | **650** | **9,476** |
| Residential real estate loans | **2,249** | **1,972** | **3,023** | **7,244** |
| Consumer loans | **51** | **4,059** | **426** | **4,536** |
| Other loans | **435** | **2,403** | **778** | **3,616** |
| **Total U.S.** | **20,606** | **43,619** | **10,003** | **74,228** |
| **Non-U.S.** | | | | |
| Corporate loans | **263** | **2,236** | **528** | **3,027** |
| PWM loans | **2,082** | **37** | **–** | **2,119** |
| Commercial real estate loans | **483** | **1,476** | **6** | **1,965** |
| Residential real estate loans | **9** | **30** | **1** | **40** |
| Other loans | **2** | **255** | **20** | **277** |
| **Total non-U.S.** | **2,839** | **4,034** | **555** | **7,428** |
| **Total loans receivable, gross** | **$23,445** | **$47,653** | **$10,558** | **$81,656** |
| Loans at fixed interest rates | **$ 240** | **$ 4,769** | **$ 3,030** | **$ 8,039** |
| Loans at variable interest rates | **23,205** | **42,884** | **7,528** | **73,617** |
| **Total** | **$23,445** | **$47,653** | **$10,558** | **$81,656** |

## Cross-border Outstandings

Cross-border outstandings are based on the Federal Financial Institutions Examination Council's (FFIEC) guidelines for reporting cross-border information and represent the amounts that the firm may not be able to obtain from a foreign country due to country-specific events, including unfavorable economic and political conditions, economic and social instability, and changes in government policies.

Credit exposure represents the potential for loss due to the default or deterioration in credit quality of a counterparty or an issuer of securities or other instruments the firm holds and is measured based on the potential loss in an event of non-payment by a counterparty. Credit exposure is reduced through the effect of risk mitigants, such as netting agreements with counterparties that permit the firm to offset receivables and payables with such counterparties or obtaining collateral from counterparties. The table below does not include all the effects of such risk mitigants and does not represent the firm's credit exposure.

The table below presents cross-border outstandings and commitments for each country in which cross-border outstandings exceed 0.75% of consolidated assets in accordance with the FFIEC guidelines.

| $ in millions | Banks | Governments | Other | Total | Commitments |
|---|---|---|---|---|---|
| **As of December 2018** | | | | | |
| Germany | **$2,028** | **$43,730** | **$ 4,755** | **$50,513** | **$ 3,834** |
| Cayman Islands | **$ 27** | **$ 2** | **$47,595** | **$47,624** | **$ 4,207** |
| France | **$1,193** | **$ 5,094** | **$11,549** | **$17,836** | **$10,307** |
| Japan | **$9,106** | **$ 1,686** | **$ 6,146** | **$16,938** | **$12,553** |
| Ireland | **$ 146** | **$ 55** | **$12,390** | **$12,591** | **$ 822** |
| Canada | **$2,383** | **$ 470** | **$ 7,845** | **$10,698** | **$ 1,513** |
| Luxembourg | **$ 22** | **$ 41** | **$ 9,799** | **$ 9,862** | **$ 2,838** |
| U.K. | **$1,101** | **$ 77** | **$ 8,458** | **$ 9,636** | **$20,336** |
| China | **$1,952** | **$ 66** | **$ 6,882** | **$ 8,900** | **$ 271** |
| South Korea | **$ 162** | **$ 2,935** | **$ 3,989** | **$ 7,086** | **$ 10** |
| As of December 2017 | | | | | |
| Cayman Islands | $ 6 | $ – | $34,624 | $34,630 | $ 4,940 |
| Germany | $4,241 | $22,765 | $ 6,916 | $33,922 | $ 7,015 |
| France | $3,569 | $ 1,574 | $19,048 | $24,191 | $14,549 |
| Canada | $2,562 | $ 311 | $17,358 | $20,231 | $ 2,388 |
| Japan | $8,827 | $ 69 | $ 7,220 | $16,116 | $18,079 |
| Ireland | $ 143 | $ 65 | $11,490 | $11,698 | $ 895 |
| China | $2,550 | $ 687 | $ 7,838 | $11,075 | $ – |
| Italy | $2,306 | $ 3,986 | $ 2,586 | $ 8,878 | $ 1,649 |
| U.K. | $1,300 | $ – | $ 7,480 | $ 8,780 | $14,966 |
| Singapore | $ 372 | $ 5,462 | $ 1,873 | $ 7,707 | $ 48 |
| Luxembourg | $ 59 | $ 324 | $ 7,320 | $ 7,703 | $ 2,438 |
| As of December 2016 | | | | | |
| Cayman Islands | $ 3 | $ – | $34,756 | $34,759 | $ 2,519 |
| France | $6,333 | $ 1,858 | $18,576 | $26,767 | $ 9,598 |
| Germany | $3,183 | $14,061 | $ 9,250 | $26,494 | $ 7,281 |
| Japan | $9,860 | $ 721 | $ 6,310 | $16,891 | $ 7,476 |
| Italy | $3,220 | $ 3,211 | $ 1,608 | $ 8,039 | $ 1,228 |
| Canada | $ 814 | $ 333 | $ 6,164 | $ 7,311 | $ 1,279 |
| China | $1,189 | $ 158 | $ 5,662 | $ 7,009 | $ – |
| Singapore | $ 190 | $ 6,165 | $ 505 | $ 6,860 | $ 97 |
| South Korea | $ 107 | $ 3,563 | $ 2,847 | $ 6,517 | $ 4 |

In the table above:

- Cross-border outstandings includes cash, receivables, collateralized agreements and cash financial instruments, but exclude derivative instruments.
- Collateralized agreements are presented gross, without reduction for related securities collateral held.
- Margin loans (included in receivables) are presented based on the amount of collateral advanced by the counterparty.
- Substantially all commitments consists of commitments to extend credit and forward starting collateralized agreements.

## Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

There were no changes in or disagreements with accountants on accounting and financial disclosure during the last two years.

## Item 9A. Controls and Procedures

As of the end of the period covered by this report, an evaluation was carried out by Goldman Sachs' management, with the participation of our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Exchange Act). Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that these disclosure controls and procedures were effective as of the end of the period covered by this report. In addition, no change in our internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act) occurred during the fourth quarter of our year ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control over Financial Reporting and the Report of Independent Registered Public Accounting Firm are set forth in Part II, Item 8 of this Form 10-K.

## Item 9B. Other Information

Not applicable.

# PART III

## Item 10. Directors, Executive Officers and Corporate Governance

Information relating to our executive officers is included on page 20 of this Form 10-K. Information relating to our directors, including our audit committee and audit committee financial experts and the procedures by which shareholders can recommend director nominees, and our executive officers will be in our definitive Proxy Statement for our 2019 Annual Meeting of Shareholders, which will be filed within 120 days of the end of 2018 (2019 Proxy Statement) and is incorporated in this Form 10-K by reference. Information relating to our Code of Business Conduct and Ethics, which applies to our senior financial officers, is included in "Business — Available Information" in Part I, Item 1 of this Form 10-K.

## Item 11. Executive Compensation

Information relating to our executive officer and director compensation and the compensation committee of the Board will be in the 2019 Proxy Statement and is incorporated in this Form 10-K by reference.

## Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Information relating to security ownership of certain beneficial owners of our common stock and information relating to the security ownership of our management will be in the 2019 Proxy Statement and is incorporated in this Form 10-K by reference.

The table below presents information as of December 31, 2018 regarding securities to be issued pursuant to outstanding restricted stock units (RSUs) and securities remaining available for issuance under our equity compensation plans that were in effect during 2018.

| Plan Category | Securities to be Issued Upon Exercise of Outstanding Options and Rights (a) | Weighted Average Exercise Price of Outstanding Options (b) | Securities Available For Future Issuance Under Equity Compensation Plans (c) |
|---|---|---|---|
| Equity compensation plans approved by security holders | 17,176,475 | N/A | 68,211,649 |
| Equity compensation plans not approved by security holders | – | – | – |
| **Total** | **17,176,475** | | **68,211,649** |

In the table above:

- Securities to be Issued Upon Exercise of Outstanding Options and Rights includes 17,176,475 shares that may be issued pursuant to outstanding RSUs. These awards are subject to vesting and other conditions to the extent set forth in the respective award agreements, and the underlying shares will be delivered net of any required tax withholding. As of December 31, 2018, there were no outstanding options.
- Shares underlying RSUs are deliverable without the payment of any consideration, and therefore these awards have not been taken into account in calculating the weighted average exercise price.

- Securities Available For Future Issuance Under Equity Compensation Plans represents shares remaining to be issued under our current stock incentive plan (SIP), excluding shares reflected in column (a). If any shares of common stock underlying awards granted under our current SIP, our SIP adopted in 2015 or our SIP adopted in 2013 are not delivered due to forfeiture, termination or cancellation or are surrendered or withheld, those shares will again become available to be delivered under our current SIP. Shares available for grant are also subject to adjustment for certain changes in corporate structure as permitted under our current SIP.

## Item 13. Certain Relationships and Related Transactions, and Director Independence

Information regarding certain relationships and related transactions and director independence will be in the 2019 Proxy Statement and is incorporated in this Form 10-K by reference.

## Item 14. Principal Accounting Fees and Services

Information regarding principal accounting fees and services will be in the 2019 Proxy Statement and is incorporated in this Form 10-K by reference.

# PART IV

## Item 15. Exhibits, Financial Statement Schedules

### (a) Documents filed as part of this Report:

### 1. Consolidated Financial Statements

The consolidated financial statements required to be filed in this Form 10-K are included in Part II, Item 8 hereof.

### 2. Exhibits

1.1 Second Amended and Restated Distribution Agreement, dated as of December 28, 2018, for Medium-Term Notes, Series N of The Goldman Sachs Group, Inc.

1.2 Form of Underwriting Agreement for Subordinated Debt Securities of The Goldman Sachs Group Inc., issued under the Subordinated Debt Indenture, dated as of February 20, 2004, between The Goldman Sachs Group, Inc., and The Bank of New York Mellon, as trustee.

1.3 Form of Underwriting Agreement for preferred stock and depositary shares of The Goldman Sachs Group, Inc.

2.1 Plan of Incorporation (incorporated by reference to Exhibit 2.1 to the Registrant's Registration Statement on Form S-1 (No. 333-74449)).

3.1 Restated Certificate of Incorporation of The Goldman Sachs Group, Inc., amended as of January 24, 2018 (incorporated by reference to Exhibit 3.1 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2017).

3.2 Amended and Restated By-Laws of The Goldman Sachs Group, Inc., amended as of February 18, 2016 (incorporated by reference to Exhibit 3.2 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2015).

4.1 Indenture, dated as of May 19, 1999, between The Goldman Sachs Group, Inc. and The Bank of New York, as trustee (incorporated by reference to Exhibit 6 to the Registrant's Registration Statement on Form 8-A, filed on June 29, 1999).

4.2 Subordinated Debt Indenture, dated as of February 20, 2004, between The Goldman Sachs Group, Inc. and The Bank of New York, as trustee (incorporated by reference to Exhibit 4.2 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 28, 2003).

4.3 Warrant Indenture, dated as of February 14, 2006, between The Goldman Sachs Group, Inc. and The Bank of New York, as trustee (incorporated by reference to Exhibit 4.34 to the Registrant's Post-Effective Amendment No. 3 to Form S-3, filed on March 1, 2006).

4.4 Senior Debt Indenture, dated as of December 4, 2007, among GS Finance Corp., as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York, as trustee (incorporated by reference to Exhibit 4.69 to the Registrant's Post-Effective Amendment No. 10 to Form S-3, filed on December 4, 2007).

4.5 Senior Debt Indenture, dated as of July 16, 2008, between The Goldman Sachs Group, Inc. and The Bank of New York Mellon, as trustee (incorporated by reference to Exhibit 4.82 to the Registrant's Post-Effective Amendment No. 11 to Form S-3 (No. 333-130074), filed on July 17, 2008).

4.6 Fourth Supplemental Indenture, dated as of December 31, 2016, between The Goldman Sachs Group, Inc. and The Bank of New York Mellon, as trustee, with respect to the Senior Debt Indenture, dated as of July 16, 2008 (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed on January 6, 2017).

4.7 Senior Debt Indenture, dated as of October 10, 2008, among GS Finance Corp., as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York Mellon, as trustee (incorporated by reference to Exhibit 4.70 to the Registrant's Registration Statement on Form S-3 (No. 333-154173), filed on October 10, 2008).

4.8 First Supplemental Indenture, dated as of February 20, 2015, among GS Finance Corp., as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York Mellon, as trustee, with respect to the Senior Debt Indenture, dated as of October 10, 2008 (incorporated by reference to Exhibit 4.7 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014).

4.9 Fourth Supplemental Indenture, dated as of August 21, 2018, among GS Finance Corp., as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York Mellon (incorporated by reference to Exhibit 4.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended September 30, 2018).

4.10 Ninth Supplemental Subordinated Debt Indenture, dated as of May 20, 2015, between The Goldman Sachs Group, Inc. and The Bank of New York Mellon, as trustee, with respect to the Subordinated Debt Indenture, dated as of February 20, 2004 (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed on May 22, 2015).

4.11 Tenth Supplemental Subordinated Debt Indenture, dated as of July 7, 2017, between The Goldman Sachs Group, Inc. and The Bank of New York Mellon, as trustee, with respect to the Subordinated Debt Indenture, dated as of February 20, 2004 (incorporated by reference to Exhibit 4.89 to the Registrant's Registration Statement on Form S-3 (No. 333-219206), filed on July 10, 2017).

*Certain instruments defining the rights of holders of long-term debt securities of the Registrant and its subsidiaries are omitted pursuant to Item 601(b)(4)(iii) of Regulation S-K. The Registrant hereby undertakes to furnish to the SEC, upon request, copies of any such instruments.*

10.1 The Goldman Sachs Amended and Restated Stock Incentive Plan (2018). †

10.2 The Goldman Sachs Amended and Restated Restricted Partner Compensation Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended February 24, 2006). †

10.3 Form of Employment Agreement for Participating Managing Directors (applicable to executive officers) (incorporated by reference to Exhibit 10.19 to the Registrant's Registration Statement on Form S-1 (No. 333-75213)). †

10.4 Form of Agreement Relating to Noncompetition and Other Covenants (incorporated by reference to Exhibit 10.20 to the Registrant's Registration Statement on Form S-1 (No. 333-75213)). †

10.5 Tax Indemnification Agreement, dated as of May 7, 1999, by and among The Goldman Sachs Group, Inc. and various parties (incorporated by reference to Exhibit 10.25 to the Registrant's Registration Statement on Form S-1 (No. 333-75213)).

10.6 Amended and Restated Shareholders' Agreement, effective as of January 15, 2015, among The Goldman Sachs Group, Inc. and various parties (incorporated by reference to Exhibit 10.6 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014).

10.7 Instrument of Indemnification (incorporated by reference to Exhibit 10.27 to the Registrant's Registration Statement on Form S-1 (No. 333-75213)).

10.8 Form of Indemnification Agreement (incorporated by reference to Exhibit 10.28 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 26, 1999).

10.9 Form of Indemnification Agreement (incorporated by reference to Exhibit 10.44 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 26, 1999).

10.10 Form of Indemnification Agreement, dated as of July 5, 2000 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended August 25, 2000).

10.11 Amendment No. 1, dated as of September 5, 2000, to the Tax Indemnification Agreement, dated as of May 7, 1999 (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the period ended August 25, 2000).

10.12 Letter, dated February 6, 2001, from The Goldman Sachs Group, Inc. to Mr. James A. Johnson (incorporated by reference to Exhibit 10.65 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 24, 2000). †

10.13 Letter, dated December 18, 2002, from The Goldman Sachs Group, Inc. to Mr. William W. George (incorporated by reference to Exhibit 10.39 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 29, 2002). †

10.14 Letter, dated December 19, 2018, from The Goldman Sachs Group, Inc. to Mr. Lloyd C. Blankfein (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed on December 21, 2018). †

10.15 Form of Amendment, dated November 27, 2004, to Agreement Relating to Noncompetition and Other Covenants, dated May 7, 1999 (incorporated by reference to Exhibit 10.32 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 26, 2004). †

10.16 The Goldman Sachs Group, Inc. Non-Qualified Deferred Compensation Plan for U.S. Participating Managing Directors (terminated as of December 15, 2008) (incorporated by reference to Exhibit 10.36 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 30, 2007). †

10.17 Form of Year-End Option Award Agreement (incorporated by reference to Exhibit 10.36 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 28, 2008). †

10.18 Form of Non-Employee Director Option Award Agreement (incorporated by reference to Exhibit 10.34 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2009). †

10.19 Form of Non-Employee Director RSU Award Agreement (pre-2015) (incorporated by reference to Exhibit 10.21 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.20 Ground Lease, dated August 23, 2005, between Battery Park City Authority d/b/a/ Hugh L. Carey Battery Park City Authority, as Landlord, and Goldman Sachs Headquarters LLC, as Tenant (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed on August 26, 2005).

10.21 General Guarantee Agreement, dated January 30, 2006, made by The Goldman Sachs Group, Inc. relating to certain obligations of Goldman Sachs & Co. LLC (incorporated by reference to Exhibit 10.45 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 25, 2005).

10.22 Goldman Sachs & Co. LLC Executive Life Insurance Policy and Certificate with Metropolitan Life Insurance Company for Participating Managing Directors (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended August 25, 2006). †

10.23 Form of Goldman Sachs & Co. LLC Executive Life Insurance Policy with Pacific Life & Annuity Company for Participating Managing Directors, including policy specifications and form of restriction on Policy Owner's Rights (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the period ended August 25, 2006). †

10.24 Form of Second Amendment, dated November 25, 2006, to Agreement Relating to Noncompetition and Other Covenants, dated May 7, 1999, as amended effective November 27, 2004 (incorporated by reference to Exhibit 10.51 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 24, 2006). †

10.25 Description of PMD Retiree Medical Program. †

10.26 Letter, dated June 28, 2008, from The Goldman Sachs Group, Inc. to Mr. Lakshmi N. Mittal (incorporated by reference to Exhibit 99.1 to the Registrant's Current Report on Form 8-K, filed on June 30, 2008). †

10.27 General Guarantee Agreement, dated December 1, 2008, made by The Goldman Sachs Group, Inc. relating to certain obligations of Goldman Sachs Bank USA (incorporated by reference to Exhibit 4.80 to the Registrant's Post-Effective Amendment No. 2 to Form S-3, filed on March 19, 2009).

10.28 Form of One-Time RSU Award Agreement (pre-2015) (incorporated by reference to Exhibit 10.32 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.29 Amendments to Certain Non-Employee Director Equity Award Agreements (incorporated by reference to Exhibit 10.69 to the Registrant's Annual Report on Form 10-K for the fiscal year ended November 28, 2008). †

10.30 Form of Year-End RSU Award Agreement (not fully vested) (pre-2015) (incorporated by reference to Exhibit 10.36 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.31 Form of Year-End RSU Award Agreement (fully vested) (pre-2015) (incorporated by reference to Exhibit 10.37 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.32 Form of Year-End RSU Award Agreement (Base and/or Supplemental) (pre-2015) (incorporated by reference to Exhibit 10.38 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.33 Form of Year-End Restricted Stock Award Agreement (fully vested) (pre-2015) (incorporated by reference to Exhibit 10.41 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2013). †

10.34 Form of Year-End Restricted Stock Award Agreement (Base and/or Supplemental) (pre-2015) (incorporated by reference to Exhibit 10.41 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.35 Form of Fixed Allowance RSU Award Agreement (pre-2015) (incorporated by reference to Exhibit 10.43 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014). †

10.36 Form of Deed of Gift (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended June 30, 2010). †

10.37 The Goldman Sachs Long-Term Performance Incentive Plan, dated December 17, 2010 (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed on December 23, 2010). †

10.38 Form of Performance-Based Restricted Stock Unit Award Agreement (pre-2015) (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K, filed on December 23, 2010). †

10.39 Form of Performance-Based Option Award Agreement (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K, filed on December 23, 2010). †

10.40 Form of Performance-Based Cash Compensation Award Agreement (pre-2015) (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K, filed on December 23, 2010). †

10.41 Amended and Restated General Guarantee Agreement, dated November 21, 2011, made by The Goldman Sachs Group, Inc. relating to certain obligations of Goldman Sachs Bank USA (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed on November 21, 2011).

10.42 Form of Aircraft Time Sharing Agreement (incorporated by reference to Exhibit 10.61 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2011). †

10.43 Description of Compensation Arrangements with Executive Officer (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the period ended June 30, 2012). †

10.44 The Goldman Sachs Group, Inc. Clawback Policy, effective as of January 1, 2015 (incorporated by reference to Exhibit 10.53 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2014).

10.45 Form of Non-Employee Director RSU Award Agreement. †

10.46 Form of One-Time RSU Award Agreement. †

10.47 Form of Year-End RSU Award Agreement (not fully vested). †

10.48 Form of Year-End RSU Award Agreement (fully vested). †

10.49 Form of Year-End RSU Award Agreement (Base (not fully vested) and/or Supplemental). †

10.50 Form of Year-End Short-Term RSU Award Agreement. †

10.51 Form of Year-End Restricted Stock Award Agreement (not fully vested) (incorporated by reference to Exhibit 10.52 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2017). †

10.52 Form of Year-End Restricted Stock Award Agreement (fully vested) (incorporated by reference to Exhibit 10.53 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2017). †

10.53 Form of Year-End Short-Term Restricted Stock Award Agreement (incorporated by reference to Exhibit 10.57 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2015). †

10.54 Form of Fixed Allowance RSU Award Agreement. †

10.55 Form of Fixed Allowance Restricted Stock Award Agreement. †

10.56 Form of Fixed Allowance Deferred Cash Award Agreement (incorporated by reference to Exhibit 10.59 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2015). †

10.57 Form of Performance-Based Restricted Stock Unit Award Agreement. †

10.58 Form of Performance-Based Cash Compensation Award Agreement (incorporated by reference to Exhibit 10.61 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2015). †

10.59 Form of Signature Card for Equity Awards. †

10.60 Amended and Restated General Guarantee Agreement, dated September 28, 2018, made by The Goldman Sachs Group, Inc. relating to certain obligations of Goldman Sachs Bank USA (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K, filed on September 28, 2018).

10.61 Amended and Restated General Guarantee Agreement, dated September 28, 2018, made by The Goldman Sachs Group, Inc. relating to certain obligations of Goldman Sachs & Co. LLC (incorporated by reference to Exhibit 99.1 to the Registrant's Current Report on Form 8-K, filed on September 28, 2018).

10.62 Lease, dated August 17, 2018, between Farringdon Street Partners Limited and Farringdon Street (Nominee) Limited, as Landlord, and Goldman Sachs International, as Tenant (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the period ended September 30, 2018).

21.1 List of significant subsidiaries of The Goldman Sachs Group, Inc.

23.1 Consent of Independent Registered Public Accounting Firm.

31.1 Rule 13a-14(a) Certifications.

32.1 Section 1350 Certifications (This information is furnished and not filed for purposes of Sections 11 and 12 of the Securities Act of 1933 and Section 18 of the Securities Exchange Act of 1934).

99.1 Report of Independent Registered Public Accounting Firm on Selected Financial Data.

99.2 Debt and trust securities registered under Section 12(b) of the Exchange Act.

101 Interactive data files pursuant to Rule 405 of Regulation S-T: (i) the Consolidated Statements of Earnings for the years ended December 31, 2018, December 31, 2017 and December 31, 2016, (ii) the Consolidated Statements of Comprehensive Income for the years ended December 31, 2018, December 31, 2017 and December 31, 2016, (iii) the Consolidated Statements of Financial Condition as of December 31, 2018 and December 31, 2017, (iv) the Consolidated Statements of Changes in Shareholders' Equity for the years ended December 31, 2018, December 31, 2017 and December 31, 2016, (v) the Consolidated Statements of Cash Flows for the years ended December 31, 2018, December 31, 2017 and December 31, 2016, and (vi) the notes to the Consolidated Financial Statements.

† This exhibit is a management contract or a compensatory plan or arrangement.

## SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

THE GOLDMAN SACHS GROUP, INC.

By: /s/ Stephen M. Scherr
Name: Stephen M. Scherr
Title: Chief Financial Officer
Date: February 25, 2019

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

By: /s/ David M. Solomon
Name: David M. Solomon
Capacity: Director, Chairman and Chief Executive Officer (Principal Executive Officer)
Date: February 25, 2019

By: /s/ M. Michele Burns
Name: M. Michele Burns
Capacity: Director
Date: February 25, 2019

By: /s/ Drew G. Faust
Name: Drew G. Faust
Capacity: Director
Date: February 25, 2019

By: /s/ Mark A. Flaherty
Name: Mark A. Flaherty
Capacity: Director
Date: February 25, 2019

By: /s/ William W. George
Name: William W. George
Capacity: Director
Date: February 25, 2019

By: /s/ James A. Johnson
Name: James A. Johnson
Capacity: Director
Date: February 25, 2019

By: /s/ Ellen J. Kullman
Name: Ellen J. Kullman
Capacity: Director
Date: February 25, 2019

By: /s/ Lakshmi N. Mittal
Name: Lakshmi N. Mittal
Capacity: Director
Date: February 25, 2019

By: /s/ Adebayo O. Ogunlesi
Name: Adebayo O. Ogunlesi
Capacity: Director
Date: February 25, 2019

By: /s/ Peter Oppenheimer
Name: Peter Oppenheimer
Capacity: Director
Date: February 25, 2019

By: /s/ Jan E. Tighe
Name: Jan E. Tighe
Capacity: Director
Date: February 25, 2019

By: /s/ David A. Viniar
Name: David A. Viniar
Capacity: Director
Date: February 25, 2019

By: /s/ Mark O. Winkelman
Name: Mark O. Winkelman
Capacity: Director
Date: February 25, 2019

By: /s/ Stephen M. Scherr
Name: Stephen M. Scherr
Capacity: Chief Financial Officer (Principal Financial Officer)
Date: February 25, 2019

By: /s/ Brian J. Lee
Name: Brian J. Lee
Capacity: Principal Accounting Officer
Date: February 25, 2019

**Executive Offices**

The Goldman Sachs Group, Inc.
200 West Street
New York, New York 10282
1-212-902-1000
www.goldmansachs.com

**Common Stock**

The common stock of The Goldman Sachs Group, Inc. is listed on the New York Stock Exchange and trades under the ticker symbol "GS."

**Shareholder Inquiries**

Information about the firm, including all quarterly earnings releases and financial filings with the U.S. Securities and Exchange Commission, can be accessed via our Web site at www.goldmansachs.com.

Shareholder inquiries can also be directed to Investor Relations via email at gs-investor-relations@gs.com or by calling 1-212-902-0300.

**2018 Annual Report on Form 10-K**

Copies of the firm's 2018 Annual Report on Form 10-K as filed with the U.S. Securities and Exchange Commission can be accessed via our Web site at www.goldmansachs.com/investor-relations.

Copies can also be obtained by contacting Investor Relations via email at gs-investor-relations@gs.com or by calling 1-212-902-0300.

**Transfer Agent and Registrar for Common Stock**

Questions from registered shareholders of The Goldman Sachs Group, Inc. regarding lost or stolen stock certificates, dividends, changes of address and other issues related to registered share ownership should be addressed (by regular mail or phone) to:

Computershare
P.O. Box 505000
Louisville, KY 40233-5000
U.S. and Canada: 1-800-419-2595
International: 1-201-680-6541
www.computershare.com

**Independent Registered Public Accounting Firm**

PricewaterhouseCoopers LLP
300 Madison Avenue
New York, New York 10017

MIX
Paper from responsible sources
FSC® C020268
www.fsc.org

The papers used in the printing of this Annual Report are certified by the Forest Stewardship Council®, which promotes environmentally appropriate, socially beneficial and economically viable management of the world's forests. These papers contain a mix of pulp that is derived from FSC® certified well-managed forests; post-consumer recycled paper fibers and other controlled sources. Sandy Alexander Inc FSC® "Chain of Custody" certification is BVQI-C020268.



4350-18-102

Goldman Sachs

goldmansachs.com