BANK OF AMERICA

What would you like the power to do?

2018 Annual Report

CONTENTS

Dear shareholders,

I am pleased to report to you that by adhering to Responsible Growth, the 200,000-strong team at Bank of America produced record earnings in 2018 of $28.1 billion, or $2.61 per share. We did this by living our purpose, which is to help make our clients' financial lives better through the power of every connection we can make — both for them and with them. Even as we continue to provide capital to our customers and clients, invest heavily in our company, and deploy capital to address some of the world's toughest priorities, we were able to return nearly $26 billion in capital to our shareholders, including more than $5 billion in dividends and more than $20 billion in share repurchases. We continue to make progress to undo the dilution from the shares we issued due to the economic crisis of 2008-2009 and subsequent regulatory changes. Our capital, liquidity and capacity to serve clients are at record levels, and we have reduced the total number of fully diluted shares outstanding to below 10 billion. Over a three-year period, total shareholder return increased by more than 50 percent, outpacing the S&P 500 and exceeding the average of our U.S. large cap peers by more than three times.

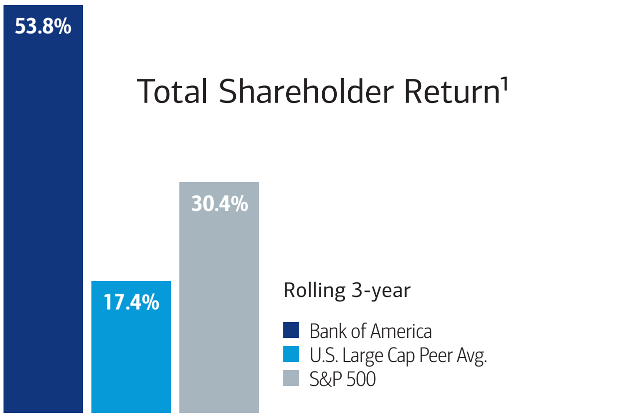
Our culture of careful expense management has resulted in a $30 billion reduction in our expense base since 2010. We achieved this even as we generated greater customer activity and revenue, addressed industrywide inflation and cost challenges, and invested consistently. Positive operating leverage — meaning the change in revenue outpacing the change in expenses — has resulted in an efficiency ratio of 58.5 percent for 2018, transforming Bank of America into one of the most efficient firms in our industry.

Backdrop for 2019

The U.S. economy remains resilient and is growing. We are proud of our Bank of America Research team, which has been ranked as the best in the world for six of the last eight years. As I write this letter in late February 2019, those experts see the U.S. GDP growing 2.2 percent this year, and the world economy growing 3.4 percent. The U.S. consumer is solid: We observed 9 percent growth in 2018 over 2017 in our U.S. customer spending and money movement through Bank of America channels. Business and consumer confidence also remain solid. We see good opportunities ahead as we deepen our relationships, and add new ones, in each of our businesses.

Driving Responsible Growth

Our commitment to Responsible Growth is resolute. In previous letters, we have discussed this framework. Responsible Growth has four tenets: We have to grow — no excuses. We have to grow by delivering more for our customers and clients. We have to grow by managing risk well. And, our growth must be sustainable. Sustainable means we have to share our success with our communities, we have to be a great place to work for our teammates, and we have to drive operational excellence. This creates the ability to reinvest the savings back into our team, our capabilities, our client experience, and our communities and shareholders.



[1] Total shareholder return includes stock price appreciation and dividends paid. Peer bank average includes C, JPM, MS, GS and WFC.

I'll review our company's performance in 2018 by discussing each of these tenets of Responsible Growth in more detail. By following them, we have kept credit costs at decade-lows and have driven positive operating leverage each consecutive quarter for four years running. For the year, we were the world's third most valuable financial services company (as measured by market capitalization) and among the world's top 10 most profitable companies. Our fourth-quarter 2018 earnings were the most among all U.S. global banks.

BRIAN MOYNIHAN
Chairman and CEO

External recognition

Being one of the most profitable and efficient banks makes it possible for us to invest in award-winning capabilities, people and products to serve our customers and clients well. In 2018, we received top recognition as a company, including being named "World's Best Bank" by Euromoney, an authoritative industry publication. We also were recognized for our employment practices and commitment to being a great place to work, our customer service, our mobile and digital capabilities, and for other products and services in every major category. In February 2019, we were ranked as one of the "100 Best Companies to Work For" by Fortune magazine and the global research and consulting firm Great Place to Work®. Bank of America also was recognized as the only financial services company on Fortune's inaugural "Best Big Companies to Work For" list, which comprises seven companies with more than 100,000 U.S.-based employees.

What would you like the power to do?

Listening to how customers, our employees and our shareholders answer the question "What would you like the power to do?" is how we learn what matters most to them. By asking, we start a conversation centered on our commitment to serve by bringing our capabilities to help clients be successful.

We ask this question of our customers, in the communities we serve, and of our employees. Responsible Growth guides us in living our purpose to help make financial lives better, and to achieve strong operating results the right way. The three-year company strategy that our board of directors reviews and approves each fall is based on continuing to adhere to this approach.

What are we asking our clients with our straightforward question? It's your financial life; it's your decision. We will bring capabilities that are second to none to help you be successful.

We will connect our capabilities for clients as no other financial services company can. Simply put: We are here to serve.

In 2018, we refined our company's brand and logo to better reflect our work and progress over many years. Over time, these will continue to evolve to better visualize the way we run our company today. We'll continue to serve by deepening our relationships, helping each individual, each business and each investor through the power of every connection we can help them make. That is our purpose, and it is how we want everyone — employees, the communities we serve, clients and investors — to see us.

Grow. No excuses.

The first tenet of Responsible Growth is that we have to grow, no excuses. As you can see on page 4, each of our businesses grew, thereby contributing to our record earnings in 2018.

Over the last four years, deposits have grown 4 percent and loans across all our business segments have grown 6 percent on average. For 2018, deposit and loan growth within our business segments exceeded the net U.S. GDP rate. That is our core growth goal: to grow somewhat faster than the economy. Throughout 2018, our client base expanded and our market positions continued to improve in most of our businesses.

Rising interest rates helped us deliver earnings growth, but we don't depend on them. Our growth in client deposits funds our loan growth across all of our businesses and enables us to continue to grow net interest income, even if further interest rate rises fail to materialize.

Our eight lines of business grew as a result of deepening client relationships and developing new relationships.

Growing by focusing on the customer

We are pleased to serve more than one in three U.S. households and more than 9 million business-owner clients. Our Consumer Banking business held $684 billion in average deposits during 2018, representing year-over-year growth of 5 percent. Average loans in that business grew by 7 percent. We have grown consumer checking balances for 40 consecutive quarters, producing an additional $200 billion in core checking deposits in our consumer business alone. In addition, average small business loans in Consumer Banking have grown 13 percent over the last three years.

Through 2018, we also continued to see rapid growth in our digital and mobile channels due to decades of investment. In 2018, our customers registered nearly 6 billion consumer banking app logins, allowing us to maintain regular connectivity with them, and provide unparalleled convenience. We have nearly 37 million digital banking users; nearly 27 million are active mobile banking customers. We now process more deposit transactions through mobile devices than in our financial centers. And 25 percent of our consumer sales, including credit cards and auto loans, were completed through a digital channel in 2018.

While we are seeing digital and mobile growth, we are investing heavily in our facilities and in the teammates who serve there, as well. We have retooled many of our ATMs, our financial centers, and our technology in the branches and call centers. And we have invested in skills for our teammates to have more opportunity in our consumer businesses.

These efforts have led to our strongest customer scores in our history. Our ability to deepen customer and client relationships is driven in part by the investments we are making to provide the best client care in the industry. For example, overall, our company was certified or recognized as having industry-leading capabilities six times by J.D. Power in 2018. Specifically, J.D. Power recognized our Digital Mortgage Experience and Home Loan Navigator for making the home-buying experience simpler than ever, and identified Bank of America as a top performer in several areas. We are the first financial services company to be both mobile app-

Recognition Highlights 2018 and 1Q 2019

Fortune
100 Best Companies to Work For (2019)

Fortune
Top global bank on 2018 "Change the World" list

Working Mother
Among the 100 Best Companies for 30 consecutive years

Euromoney
- World's Best Bank
- World's Best Bank for Diversity and Inclusion

Military Times
One of the Best Employers for Vets

Investing in Women Initiative
2019 Catalyst Award Winner

Greenwich Associates
Recognized for excellence in digital design, digital product capabilities and security for U.S. corporate cash management

Barron's
#1 wealth management firm on Top 100 Women Financial Advisors list for 13 consecutive years

J.D. Power
"Outstanding Website Experience" — Merrill Edge Call Centers for 7 consecutive years

J.D. Power
#1 in Retail Banking Advice

Kiplinger
A Best Rewards Credit Card

The Banker
2018 U.S. Bank of the Year, Top Transaction Services Bank in N.A.

Forbes
#1 wealth management firm on America's Top Next-Generation Wealth Advisors list

Consumer Banking

Net income of **$12B,** up 47% over 2017

Average loans and leases up 7% to $284 billion

Average deposits up 5% to $684 billion

Global Wealth & Investment Management

Net income of **$4.1B,** up 32% over 2017

Average loans and leases increased 6% to $161 billion

Pretax margin increased to 28%*

Global Banking

Net income of **$8.2B,** up 18% over 2017

Average loans and leases increased 2% to $354 billion

Average deposits increased 8% to $336 billion

Global Markets

Net income of **$4B,** up 21% over 2017

Sales and Trading revenue of $13.1 billion*

Return on average allocated capital of 11%, up from 9% in 2017

*Presented on a fully taxable-equivalent basis.

and online banking-certified by J.D. Power for providing "An Outstanding Customer Experience." Our auto finance, digital, mobile and credit card banking capabilities all were recognized as best-in-class, as were our small business offerings.

We saw similar growth in our Global Wealth and Investment Management business, where net new household growth was up four times from 2017, and overall client balances exceeded $2.6 trillion. We have added digital capabilities, more advisors and new products.

Our Global Banking business continues to do a great job serving up to the largest multinational companies. We also are deepening relationships with those clients, and adding new clients. As a result of investments we have made in relationship bankers, we have seen a 28 percent and 32 percent increase in net new relationships, respectively, in Business Banking serving smaller companies, and Global Commercial Banking serving middle-market companies. This is accompanied by solid deposit growth in Global Banking overall, up 9 percent at the end of 2018. Our teams earned top awards for providing the best client care in the industry, including Euromoney naming us the best bank in North America for small- and medium-sized enterprises. We received further recognition as the top Transaction Services bank in North America and best brand for cash management.

Our customer-centered growth extends into our institutional investor segment. Through our investments in our Global Markets business, and increased balance sheet commitment to our clients, we have seen an expansion in our prime brokerage business. Over the last several years, we have invested heavily in new systems and expanded products and electronic trading for investor clients. This contributed to record revenues in our equities business and solid fixed income business performance.

Growing within our Risk Framework

Another core tenet of Responsible Growth is that we grow within our Risk Framework, and we had solid results in 2018. Total net charge-offs remained at decade-lows, while the net charge-off ratio declined 3 basis points to 41 basis points. All key asset quality metrics are solid. We are committed to being in a strong position to support clients throughout economic cycles. We have also managed market risk well during the turbulent markets in 2018, and our market risk indicators remain low. Through operational excellence we have also kept operational risk in check.

Delivering sustainable Responsible Growth

As I mentioned earlier, we ensure Responsible Growth is sustainable. This requires relentless progress across three dimensions: sharing our success with our communities; striving to be a great place to work for our employees; and driving operational excellence. We continued to make progress in each area in the past year.

Sharing success with the communities we serve

There are many ways we share our success. Our teammates volunteered 2 million hours supporting local organizations in 2018, and we introduced enhancements to our employee giving and matching gift programs. For 2019, we are increasing total annual philanthropic giving across the company to $250 million from $200 million. Since 2010, we have extended nearly $2 billion in philanthropic giving across the markets we serve in the U.S. and abroad.

Also in 2018, we provided $4.7 billion in loans, tax credit equity investments and real estate development solutions through our Community Development Banking business. We financed affordable housing for seniors, veterans and the formerly homeless, charter schools and economic development. Through our Capital Deployment Group, we have been developing innovative financing approaches to address global challenges outlined in the United Nations Sustainable Development Goals, including affordable housing, clean water and sanitation, education, health care and renewable energy.

In recognition of the attention we pay to addressing these important priorities, I'm pleased that Bank of America was named the top global bank on Fortune magazine's 2018 "Change the World" list. Fortune recognized our work mobilizing and deploying capital to address global challenges through our core business strategy.

We know if we continue to align our work to serve shareholder interests and address the priorities of our communities at the same time, the progress can be sustainable. I'll discuss that in further detail below, and you can find an extended review of our work in these areas later in this report, including a letter from Vice Chairman Anne Finucane on page 22.

Being a great place to work

Another tenet of sustainability is ensuring we remain a great place to work for our teammates; the record employee satisfaction scores in our 2018 annual employee survey demonstrate this commitment. Our teammates especially value how we provide for employee health and wellness. Between current U.S.-based employees and their families, and retirees, we are responsible for providing comprehensive health and wellness benefits to nearly 400,000 people. For the ninth consecutive year, we have held the cost of this benefit flat for the lowest-compensated employees, even as we continue to improve the coverage. For all employees, we have managed to keep increases below national averages.

We also continue to make regular adjustments to starting-level compensation at our company. We have been a leader in establishing an internal minimum rate of pay for our U.S. hourly paid employees and have made regular increases over many years. Two years ago, we raised our minimum wage to $15 per hour, and our minimum wage is higher today. Our average rate for all U.S. hourly paid employees is significantly above this level.

Our work in this area also includes employee development and opportunities for growth. We foster our client-centric culture through strategic workforce planning, anticipating the future of work and creating a culture of lifelong learning. In 2018, nearly 40,000 of our Consumer and Small Business employees completed a learning curriculum, giving them more skills for broader success. We hired more than 27,000 new teammates to the company last year (including 3,500 plus from colleges and universities); we helped more than 17,000 employees find new roles in the bank; and 86 percent of eligible managers voluntarily participated in manager development courses to improve their skills. The implications are global; we also moved more than 5,000 jobs from non-U.S. markets to the U.S. over the last four years.

Another area of focus has been sharing the benefits of the 2017 U.S. tax reform. Since the passage of the Tax Cuts and Jobs Act in December 2017, we have extended two special compensation awards, impacting approximately 90 percent (in 2017) and 95 percent (in 2018) of our teammates globally. These awards included cash bonuses and stock, totaling more than $1 billion, and were in addition to the compensation these teammates otherwise received.

Please look for more details in this report, and in our proxy statement, about all we do to be a great place to work, including a letter from Chief Human Resources Officer Sheri Bronstein on page 30.

Driving operational excellence

We also ensure that Responsible Growth is sustainable though our focus on operational excellence — continuous improvement in our internal and external processes to make it easier for our employees to work with each other and to serve clients and customers. By pursuing operational excellence, we are becoming more efficient, so we can continue to invest while providing you good returns. This makes all the other progress that I've discussed possible.

Focusing on operational excellence allows us to continue to invest in our capabilities and in our team, even as we maintain expense discipline. While we face the same

Responsible Growth has four tenets

Grow and win in the market, no excuses

Grow with our customer-focused strategy

Grow within our Risk Framework

Grow in a sustainable manner

inflation and cost challenges all employers do (e.g., benefit increases, wage increases, real estate cost increases, more investment), we managed through them. We achieved our 2018 expense target of approximately $53 billion. We set that goal in mid-2016, when our annual expense run rate was $57 billion. Managing expenses well has contributed to four straight years of positive operative leverage and allowed us to grow pretax earnings at 18 percent in 2018 — all while investing in the company.

I have mentioned some of the areas in which we are investing: adding relationship managers for our Global Banking clients, continuing to improve on our leading digital and mobile capabilities for all client segments and for our teammates, investing in health and wellness benefits for employees, our philanthropy increase, and the shared success bonuses we paid to 95 percent of our teammates in 2018.

Since 2010, we have invested roughly $25 billion in new technology initiatives. This includes reworking effectively all of our major systems and adding innovative capabilities, while also building an internal cloud and software architecture for maximum efficiency and speed to market.

Technology investments are directed at innovation across our company. Perhaps that is most apparent in the investments we continue to make in our industry-leading online consumer platform and state-of-the-art branch network. Erica™ is one example. Our virtual banking assistant that combines interactive communications and artificial intelligence (AI) to learn and anticipate client needs is unique in the industry. Since we introduced Erica in spring 2018, more than 5 million customers have used the capability and the adoption rate is growing fast.

Another innovation in which we've invested is Zelle™, our peer-to-peer transfer capability enabled by our mobile app. Bank of America, along with other large banks, developed Zelle and we have extended full access to the capability to a growing network of participating financial institutions. Customers of virtually any bank of any size can now send money to one another through the safety of their bank account in real time. Zelle transactions by our clients are growing over 100 percent a year, and we had nearly 5 million users at the end of 2018. And we're just getting started.

Another investment we've made is in our digital auto shopping experience, enabling customers to search, select a car, and get underwritten in real time. Customers can use our mobile app to search online for a car with access to thousands of dealers' inventories, with over 1 million cars available. We have seen a seven-fold jump in financing applications in this area since launch in May 2017.

Our investments in digital and mobile preferences for the customer have resulted in higher customer satisfaction scores and more deposits, while allowing us to reduce our branch count by more than 1,300 since 2012.

And we continue to invest in improving our customer branch experience. Our 4,300 current centers are places where 800,000 customers come each day to talk with a relationship or product specialist for the financial advice, products and services they need.

In 2016, we announced our plans to renovate our financial centers and upgrade our ATMs nationwide to better serve our clients, expand our consumer and small business services into new markets, and grow our presence in existing markets. I provided an update last year, including our intention to expand our financial center presence in nine new markets to offer retail banking, lending, small business and investment services. Today, we cover more than 80 percent of the U.S. population with our retail branch footprint. With the scheduled investments, we will cover more than 90 percent.

We continued to execute this plan in 2018. We expanded our presence in 25 markets, including our newest — Denver, Minneapolis, and Indianapolis. We also entered the Pittsburgh market in 2018, and will be opening our first financial center in Salt Lake City in early 2019. In addition to opening 81 new financial centers last year, we completed renovations on 567 others. We are redesigning more than 2,500 financial centers by 2021 to make it easier for clients to access our banking and investing professionals for advice on their life priorities and financial goals. Adding financial centers also helps drive local employment, as we have added teammates across the new centers.

Look for a more detailed discussion of our high-tech, high-touch capabilities with Dean Athanasia, president of Consumer and Small Business, on page 15 of this report.

While our investments may be most apparent in the Consumer and Small Business segment, we are investing and innovating to better serve all of our clients. We have extended our mobile consumer experience into our commercial banking digital platform, with capabilities that enable treasurers of companies, both large and small, to transact with the same mobile convenience. This innovation benefits the clients whom we assist with markets-related services and activities, such as electronic trading, algorithms, analytical capabilities, systems and data management, and counterparty risk management and underwriting systems. For wealth management and investment clients, we have automated investing tools, enhanced document scanning and client texting.

Across our company, upgraded, integrated systems allow faster execution for customers with our enhanced reporting, robotics and automation. The application of advanced technology, coupled with our focus on client relationship management, creates a competitive advantage. And our universal, enterprisewide platform increases our efficiency and helps us better serve clients and customers. All this, combined with our global reach, creates a tremendous capability for you.

Remember, all this investment is driven by operational excellence — creating efficiency and investment in the future. The investments made in 2018 were extensive but we were able to reduce expenses through operational excellence. For 2019 and 2020, we expect expenses to remain flat even while we are making these investments. That makes our growth sustainable so we won't have to pull back in times of slower economic growth.

Committed to strong governance

Please read the letter from Jack Bovender, our lead independent director, for a description of how the board of directors supports and oversees our strategy. Jack and our directors continue their practice of systematic investor engagement. In 2018, we met with shareholders holding more than 30 percent of our shares. Jack discusses this in further detail in his letter on the next page.

We were pleased to welcome back to the board last year Dr. Clayton S. Rose, who served as a director of our company from 2013 until 2015. Clayton was named president of Bowdoin College in Brunswick, Maine in 2015. He was able to rejoin our board last year and offers terrific perspective. We benefit from his insight on a range of issues.

Operating at scale to address important societal priorities

Earlier, I referenced challenges related to affordable housing, clean water, education, health care, renewable energy, energy efficiency and other critical areas outlined in the United Nations Sustainable Development Goals (SDGs). The way I think of this is that, in effect, we asked the world through the efforts of the United Nations, "What would you like the power to do?" And the world spoke. Society would like to see timely progress in addressing these priorities.

The issues are, of course, a concern to policymakers and elected officials at every level of government. But they are also a concern to our teammates, our customers and clients, the communities we serve, and our shareholders.

At Bank of America, we realize there is a significant gap between the capital that must be applied to these global challenges and the amount that is currently being spent. Credible estimates of what is needed to address the U.N. SDGs is about $6 trillion per year; the current annual funding gap is as much as half that.

Government alone can't solve these challenges. The U.S. government, with the largest economy in the world, will spend more than $4 trillion this year. But almost two-thirds of those total expenditures are committed to non-discretionary needs: funding the social safety net, servicing U.S. debt and other commitments. The discretionary elements of the budget include national security, education, health care and other priorities. The same is true for other governments and economies around the world. The government budgets are fully committed, and in many cases in difficult shape, so counting on governments to spend more is not a likely solution.

Charitable giving alone also cannot fill the need. Annual giving from individuals, foundations, and corporations is spread across many worthy causes and, even in the aggregate, falls short. The U.S. is the largest philanthropic giver in the world as a percentage of GDP. Total giving to charitable organizations overall in the world was around $800 billion in 2017 and $410 billion in the U.S., primarily from individuals. Assets by foundations in the world are estimated at about $1.5 trillion; nearly half of that is held by foundations in the U.S. at $890 billion. Again, even if we spent all that money in a single year, it would be insufficient to close the gap.

We operate in nearly 300 cities, towns, and communities, consolidated into 92 distinct markets in the United States, and in three dozen countries around the world. We are part of the fabric of those communities, where our 200,000 teammates live, work, and raise their families.

Public companies that employ and invest at the scale that we and others do are well-positioned to address income inequality, clean energy, health care, and affordable housing through thought leadership, investment, innovation, mobilization of capital and in other ways. Private-sector leadership is necessary because solutions involving capitalism are inherently sustainable, and the returns will bring continued and increasing investment.

But, as the great student of business and author Jim Collins has said, we have to embrace "the genius of the AND." We have to do our part to achieve strong and timely progress on the sustainable development goals AND we have to deliver

A message from Lead Independent Director Jack Bovender

Dear fellow shareholders,

On behalf of the independent directors of the company, I join Brian and the management team in thanking you for choosing to invest in Bank of America.

Our board continues to focus on its responsibility to oversee the company's execution of the strategy that we review and approve each fall. To do that, the board engages in a year-round strategic assessment and planning process. That includes regular discussions with the company's management about the current operating environment, industry trends and global and geopolitical developments. We also engage in regular and systematic dialogue with our shareholders. Throughout 2018 and into this year, we have provided updates to, and solicited input from, shareholders representing more than a third of our shares outstanding. Shareholder feedback informs our board meeting agendas and contributes to governance enhancements. We seek input and exchange views on matters ranging from executive compensation to capital deployment and environmental, social, and governance initiatives.

The board comprises diverse individuals representing a spectrum of informed viewpoints. Fifteen of the 16 directors are independent; 63 percent have CEO-level experience; and 38 percent have senior executive experience at financial institutions. As Brian outlines in his letter, the board in 2018 welcomed the return of Dr. Clayton S. Rose as a director. Clayton's expertise includes strategy, ethics, moral leadership and corporate responsibility. He and all the directors provide valuable perspective as the company continues to pursue responsible growth.

We remain committed to providing you all the material and information you need to understand and appreciate both the opportunities and the challenges ahead as the company continues to execute its strategy. Please take the time to carefully review this annual report, as well as our proxy statement, and the other materials the company makes available to shareholders.

Thank you again for your investment and for your continued engagement.

Sincerely,

strong returns to you, our shareholders, as we do so. This enables us to keep addressing these important priorities. We are doing this, and we are committed to doing more.

How does Bank of America do this?
First, we continue to align our expense base and our balance sheet to find every business opportunity to provide good returns and to make progress toward our goals. We do this by financing new energy sources, by financing affordable housing, and by financing other types of development. These financing opportunities provide a return for investors while making progress on the goals.

Second, we bring thought leadership to the discussion. Our Research team has demonstrated that companies adhering to sound environment, social, and governance (ESG) practices will avoid serious issues. In fact, their research shows that investors could have avoided almost all of the bankruptcies of the last several years by avoiding companies that do not have good metrics on ESG. Increasingly, investors are looking for that kind of adherence in making investment decisions. This is driving more private-sector investment capital from institutional investors toward companies that are addressing these priorities. We also see this in our wealth management businesses, where we are meeting client demands to construct portfolios focused on companies that meet standards consistent with progress toward the sustainable development goals. The practice is growing. By harnessing private capital in this manner, the alignment we create can help fill the gap left by limitations in government and philanthropic spending by bringing more resources, capital, and expense to the task. In addition, we can be a catalyst for others to act. Our expertise, credibility, and ability to assess the opportunities can help others who have the desire but may lack the expertise to deploy capital.

Third, we contribute in the ways we manage our own activities. We are more than halfway through our 10-year, $125 billion Environmental Business Initiative, supporting clients and others who are helping create a sustainable energy future. We also focus on our own sustainable facilities management and improved energy efficiency. For instance, we have set a goal to be carbon neutral by the end of 2020.

We also run your company to provide great opportunities for teammates. We hire from a diverse range of locations and backgrounds, and provide opportunities for teammates to pursue their own path and excel. That kind of opportunity for success allows a teammate to join us, for instance, from a low- or moderate- income neighborhood (as did more than 30 percent of our Consumer and Small Business external hires last year) and move into future openings throughout our company based on their own merit and desire.

Fourth, our own ESG work makes a direct impact. The direct investments we make, the volunteer efforts of our teammates, our philanthropic works—all of this helps address the challenges. While our own ESG work through giving and volunteerism cannot solve the challenges as we have relayed, we are proud of what our teammates directly do to help make progress on these priorities.

Let me give some examples of the different types of activities set forth above:

Bank of America committed more than $50 billion last year in lending, investing and philanthropy to deploy capital toward the SDGs. In fall 2018, we created a special $60 million Blended Finance Catalyst Pool to encourage more companies to participate in addressing those priorities. Our blended finance initiative combines different sources of capital for a targeted objective, in order to accommodate different risk tolerances and rates of return. As this approach expands over time, we can create the capacity to mobilize vast amounts of capital and achieve the scale necessary to fundamentally address global challenges driven by the force of private-sector capital returns.

In one of the first commitments of our catalyst pool, we joined with two other financial services companies in our headquarter city of Charlotte, North Carolina, to extend more than $70 million to fund low-income housing developments. Most of that amount will be low-interest loans to private developers building income-restricted housing.

We believe it is not only possible, but it is the desired outcome for Bank of America as a public company to simultaneously serve our clients, deliver for our shareholders AND address these local, national, and global social priorities. Delivering on both aspects of the "AND" is the way to ensure that we can continue to channel the capital from others and from our company that is needed to fund societal needs. We all have to provide great returns, while delivering on the goals.

Our teammates are called upon in every community where they live and work to lead efforts that promote economic and social development, and I am proud of how they step in to help. We welcome the continued interest of elected officials in these efforts and engage them across the cities, towns and communities we serve. Our commitment is a core element of Responsible Growth.

Thank you for being a shareholder

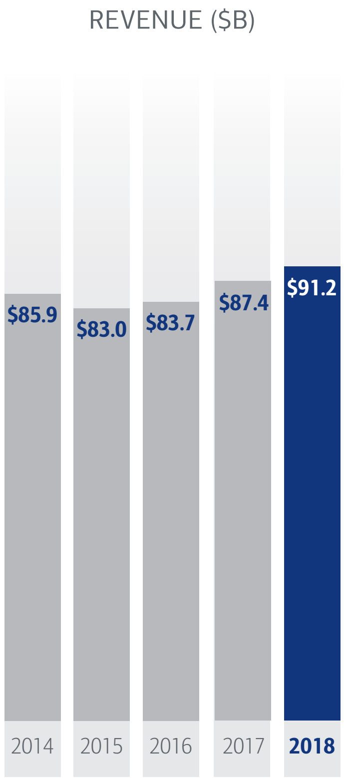
I hope you find it informative and enjoyable to read more about Bank of America in the following pages, where you'll see more examples of how we're helping to make financial lives better through every connection. You can read how we're connecting with clients every day to help them achieve their goals, simply by asking:

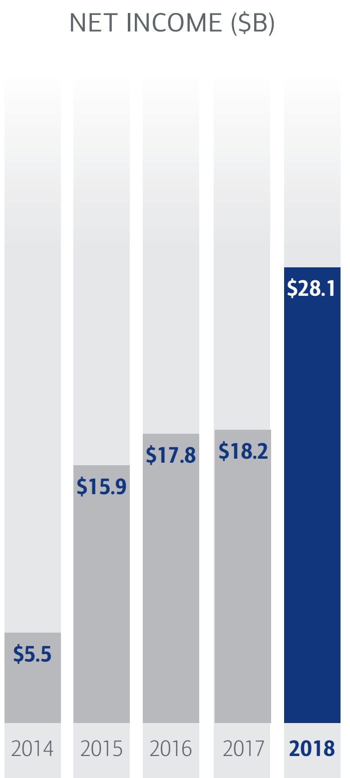
"What would you like the power to do?"

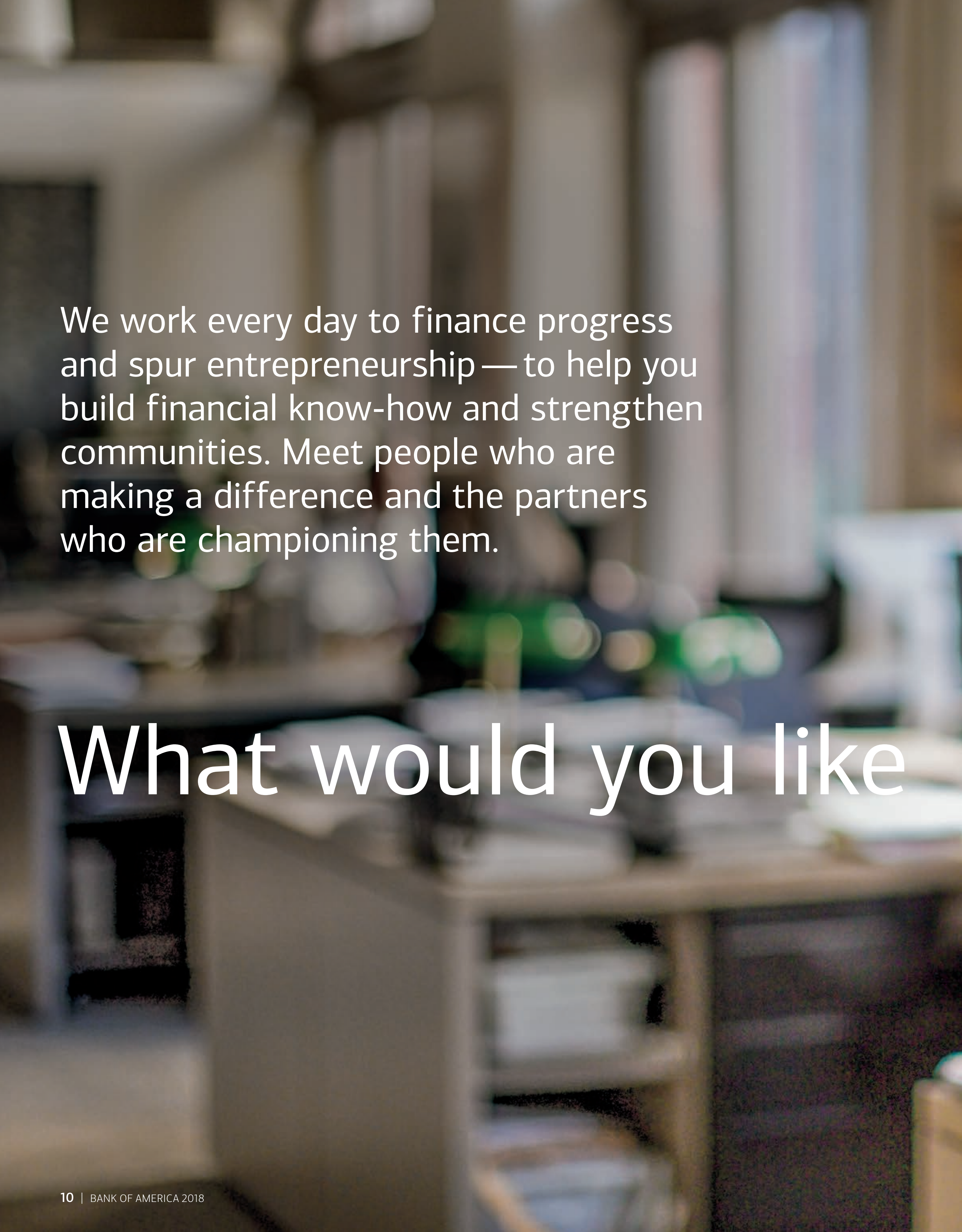
I am proud to work with my 200,000-plus teammates who are listening for your answer.

Thank you for your support and investment in Bank of America.

Brian Moynihan
March 1, 2019







We work every day to finance progress and spur entrepreneurship — to help you build financial know-how and strengthen communities. Meet people who are making a difference and the partners who are championing them.

What would you like


the power to do?™

With Bank of America, you have the power to manage your financial life here…

Exceptional client service is high-tech and high-touch.

Technology is transforming financial services and changing the way clients and banks interact. Yet, when it comes to making major financial plans, our clients also want to be able to work directly with our team of experts who can provide the advice and counsel they need. It's the combination of both of these that makes our offering really powerful. We're building relationships based on how clients' needs evolve throughout their financial lives, combining digital access for everyday banking — at any time, from anywhere — with expert advice for life's big financial decisions.


...and here.
Audrey

Q&A with Dean Athanasia, President of Consumer and Small Business

Q: WHAT DO TODAY'S CONSUMERS LOOK FOR IN A BANK, AND WHAT IS BANK OF AMERICA'S STRATEGY FOR EXCEEDING THOSE EXPECTATIONS?

A: Clients want a bank that is committed to helping improve their financial lives, so they have the power to do the things that matter most to them, like open their first banking account, make payments with ease, buy a home, invest, grow a business and leave a legacy. We're working continuously — on both high-tech and high-touch solutions — to earn our clients' trust and to give them more reasons to bank with us. Whether it's investing in digital banking and new solutions, redesigning our financial centers, or offering learning and development programs to help our teammates expand their skills — these actions help us provide better service, while growing responsibly and sustainably with our clients.

More importantly, client care is how we build and expand rewarding relationships with our clients and help them at every stage of their financial lives. We put clients' needs at the heart of every decision we make to ensure they have the best products and solutions, serving all of their financial needs, delivered with a consistently great experience that recognizes and rewards them for their relationship with us.

Q: WHICH CURRENT INNOVATIONS BEST DEMONSTRATE BANK OF AMERICA'S LEADERSHIP IN DIGITAL BANKING?

A: We continue to invest and innovate because clients expect us to be at the forefront of the technological advances that are transforming banking — and their financial lives. We have created a best-in-class, innovative digital experience that gives clients the power to manage their banking and investing activities from their mobile phone, including checking an account balance, applying for a mortgage, paying a friend, or even shopping for a car.

Our digital leadership is reflected in our award-winning mobile app, the first to receive J.D. Power's certification for "An Outstanding Mobile Banking Customer Experience." Erica, our artificial intelligence (AI)-driven virtual financial assistant, is helping more clients stay on top of their banking every day. Zelle, the person-to-person payment platform, had nearly 5 million users at the end of 2018. Small Business clients can now manage more of their banking through mobile devices. Our Digital Mortgage Experience™ now offers clients the ability to request a preapproval. And, we're continuing to expand our digital resources so clients can bank and invest however, wherever and whenever they choose.

Q: WILL THE FUTURE OF BANKING LEAN MORE TOWARD DIGITAL OR BRICK-AND-MORTAR CAPABILITIES?

A: Clients want to be able to accomplish their everyday banking conveniently through their mobile devices, and connect with client representatives in our financial centers when they have more complex needs. The power of our integrated high-tech and high-touch approach means they have the best of both worlds; for example, clients can make an appointment to speak with a specialist on their mobile device, and Erica can even help them set it up! When clients come to our financial centers for help, knowledgeable professionals provide advice in a private setting. We're on track to redesign more than 2,500 financial centers by 2021 to make them welcoming destinations where clients can have personal, in-depth conversations with our professionals about their financial goals, including retirement, purchasing a home, investing or saving for their children's education.

Our financial centers will always be a welcoming and professional setting for clients who need to speak with us about their financial priorities and goals. And with 9.5 million Hispanic and Latino consumer clients, we're investing in talent, upgraded financial centers and community outreach, beginning with 300 centers in Los Angeles, New York, Miami, Chicago, Dallas and San Francisco. We're expanding into local markets across the U.S. where we see opportunities to better serve existing clients, grow our business responsibly and help local communities thrive.

Delivering tailored wealth management solutions for every stage in life

Our unmatched wealth management businesses serve clients of every age, at every stage of their financial lives, across the wealth continuum. Our top-ranked advisors provide objective, conflict-free advice and clear, actionable financial plans based upon our clients' goals and aspirations. We offer rewards when clients deepen their relationship with us, and access to seamless integration with the rest of our global firm to help meet every banking need, whether business, commercial, corporate and investment, or retail.

"I like to show my clients, many of whom are new to investing, how easy the process can be when they focus on their life priorities to help define their investing goals. I'm proud of what we offer investors through our online investing platform. Clients can put their own ideas into action or get financial guidance — either through our digital capabilities or with the help of an advisor — and access investing insights supported by our award-winning research and tools."

MIA ZIRING
Financial Solutions Advisor, Merrill Edge

"What our clients are looking for is a partner who helps them navigate their financial and family plans. They value working with someone they trust who can advise them on all aspects of their financial affairs — investments, banking, credit, philanthropy and planning for the next generation. The combination of Merrill Lynch investments and Bank of America banking allows us to provide clients the solutions to realize their goals throughout their lifetime."

DEBBIE JORGENSEN
Managing Director, Wealth Management Advisor, Merrill Lynch Wealth Management

"One of the advantages we provide to our clients is our team-based approach and high level of client service. Our teams spend a lot of time up-front with clients to understand their needs and goals. When combined with access to all of Bank of America's capabilities, our teams are able to provide solutions to address the opportunities and challenges our clients face."

JANET RYAN
Managing Director, Private Client Advisor, U.S. Trust, Bank of America Private Wealth Management

I would like the power to have a second act

FIDELIA

When Fidelia retired from her successful career as a retail executive, she turned to Bank of America for help planning her financial future. With goals that included caring for her mother, continuing her education and launching a second career, she consolidated her accounts to Merrill Edge and rolled over her pension and 401(k). She also set up a new Merrill Guided Investing account to help her retirement savings stay on track with a professionally managed portfolio. "I'm able to direct my own investing, but I always have an advisor to turn to," she said. According to Fidelia, putting her Bank of America and Merrill Edge accounts together and having advisors who understand her goals make her feel more in control of her future. **"I feel like Bank of America is invested in my success. They know where I want to go and how to help me get there."**

I would like the power to be my own boss

LISA

When faced with any of life's sizable decisions, one of Lisa Young's initial calls inevitably is to her Merrill Lynch financial advisor, Sammie Kothari Peng. "I literally asked her for advice about how I should most strategically allocate my very first paycheck," Lisa said with a chuckle.

That forethought and attention to detail explain how Lisa enjoyed a successful corporate career before making the complicated transition to start her own business. "Within just a few years, my life underwent a series of significant changes: marriage, children, buying a home, starting my own business, needing to save for retirement and colleges," said Lisa, who, like her parents, is a longtime Merrill Lynch client.

"These life events raised questions that required proactive solutions: 'What are my long-term and short-term needs? What type of budgets should I establish, and which accounts and investments will that involve? How much should I put away for a house, and for our children's education?' Sammie not only answered our questions — she anticipated those that my husband and I didn't even know to ask. And when it came to launching my own business, she clearly understood my financial risks and helped me plan for them. She even connected me with one of her clients who was in the same industry, which led to my first contract."

Lisa added, "I want to be a role model for my kids — especially my daughter — to show her that you can work hard and be successful and also do it on your terms. To achieve that success, we all need people we can trust, who have the most reliable and sound advice. **Sammie knows and understands us so well — our family's needs, our dreams and our approach to finances. She is always there when significant decisions need to be made."**

"Lisa and I never lose focus on the big picture," Sammie said. "That can involve a conversation about the equity and fixed-income markets, 529 plans, 401(k)s, or even the ability to say no to a particular work contract if it does not align with her ultimate work-life balance goals. I am so proud of all that she has accomplished, and will always be available to her as she continues her journey. She knows I'm just a phone call away."

We would like the power to create a legacy

RAFAT AND ZOREEN

"If I have a financial issue, or almost any issue, the first person I would call is my Merrill Lynch advisor," said Rafat Ansari. That level of trust was established in the first meeting Rafat and his wife, Zoreen, had with Merrill Lynch financial advisor Matt Kahn, who hit on a series of questions that proved invaluable. Their daughter, who has autism, was about to gain access to a trust in her name that had been established by a previous firm. But the trust didn't incorporate her need for certain services she would have lost if she had gained access. "We had no idea she was close to losing what mattered most, benefits that you cannot buy," said Zoreen.

To ensure her medical and financial needs could both be met, Matt brought in expertise from another Merrill Lynch team with unique experience serving families with special needs. After much hard work and collaboration on a new trust, they retained her benefits and strengthened her financial future. "Since that day, Merrill Lynch has been an integral part of her care plan, and in all aspects of our family's financial planning," said Zoreen.

With their daughter's stability secured, the Ansaris began to focus more on their legacy. "We want to give something back to humanity," said Rafat. The family, which is passionate about philanthropy, brought the idea of making a significant gift to the University of Notre Dame to their advisory team with a common question: What can we afford to give? Financial Advisor Jennifer Haggerty prepared multiple options and carefully explained how different gift levels may affect their financial future over time, as well as options for structuring the gift. "We had to think, how is it going to affect us? There were a lot of parts," said Rafat. Over the course of several months, Matt and Jennifer worked closely with the Ansaris and their children, their CPA and the university to make their vision a reality, creating the Rafat and Zoreen Ansari Institute for Global Engagement with Religion, which was established to foster a better understanding of religion by studying the similarities and roles of religions and their impact on the public sphere around the world.

"This institute is a legacy for us," Rafat said. **"Merrill Lynch was quite helpful through the entire process. Our relationship with them has been great, and it's on multiple levels, including investments, estate planning, lending, and advice. It's a complete service line for us.** Whatever we need, it's just one call away from being taken care of. Our team is easily accessible at any time, and I feel very comfortable knowing that," said Rafat. The couple agrees that working with Merrill Lynch has helped them meet their most important life goals. Zoreen added, "We've gained in our financial strength. We've established estate planning for our children and the program at Notre Dame. We feel taken care of, as a whole."

Supporting companies as they grow, innovate and lead

Clients down the street and around the world look to our teams to help power their growth. Small business owners get the support they need to open their first business accounts, including access to solutions for cash management, paying suppliers and meeting liquidity requirements. Larger companies may need currency risk management, sophisticated treasury solutions, and ongoing capital and liquidity financing. Companies and institutional investors alike rely on our talented teams and leading research for ideas and opportunities to grow and innovate.

$8.6 billion
in new credit extended to small business owners in 2018

One of the
top small business lenders
with approximately $35 billion total outstanding small business loan balances[1]

A top SBA lender
with more than $275 million in combined SBA 504 and 7(a) loan volume in 2018[2]

$1.5 billion+
in loans and investments to community development financial institutions

A leading commercial lender
with nearly $500 billion in commercial loans and leases at the end of 2018

Relationships with 79 percent of the 2018
Global Fortune 500
and 94 percent of the 2018 U.S. Fortune 1,000

Leading dealer in FX cash, derivatives, electronic trading and payment services in
151 currencies

#1
global green bond underwriter[3]

Rated #1 global research firm 6 of last 8 years
by Institutional Investor magazine (ranked second in 2017 and 2018)

650+ analysts covering
3,000+ companies, 1,100+ corporate bond issuers across 54 economies and 25 industries

[1] Source: FDIC, as of Q3 2018.
[2] Based on 2018 gross loan approval as provided by the SBA for fiscal year ending 9/30/2018.
[3] Source: Environmental Finance.

Skookum would like the power to change the world

Skookum Contract Services operates with a mission to change the world through its diverse workforce of more than 1,100 employees, including over 400 U.S. veterans. The Bremerton, Washington-based nonprofit began over 30 years ago with just a dozen employees; today, it has grown its presence to 11 states and Washington, D.C. by providing world-class logistics, aerospace manufacturing, and facilities management services to government and commercial customers.

"We're here to change the world," said Skookum President and CEO Jeff Dolven. "Each of us brings abilities to work that can drive performance and create value. Think about the engagement you get in the workforce when you help people realize their dreams." That Bank of America has been with Skookum through each stage of its continuing evolution is no accident.

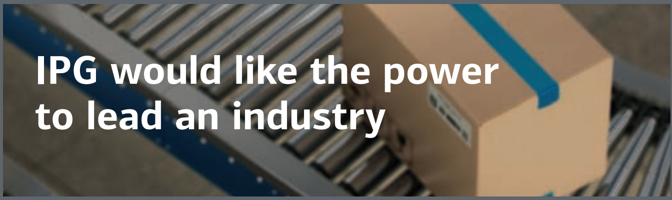
"Years ago, we were smaller and focused on our financial health and our balance sheet, but we had a very clear agenda to expand the scope of our impact," Jeff said. "We wanted to be associated with a bank that had a brand that was clearly recognized as a symbol of strength. To us, there was no question that was Bank of America. So we made it a goal to become a client of the bank. Every step we took financially was to achieve that goal. And we did it."

For more than 15 years, Bank of America has provided financial and strategic guidance to Skookum — providing liquidity for new client contracts, financing their headquarters purchase, and even introducing a series of wealth management seminars to Skookum employees.

"Skookum is a best-in-class organization that lives its exceptional mission every day," said Jeremy Bolles, Bank of America's senior relationship manager. "While they are focused on helping job seekers overcome barriers and find long-term success in the workplace, we are working to help the company operate efficiently, act on growth opportunities, and continue to plan for the long term. We're proud to support their efforts, whether that's providing a new line of credit, customizing payroll solutions, joining the board for strategic planning sessions, or even flipping burgers at the company picnic."

"Jeremy and the team at Bank of America have taken the time to know us so well, to become so embedded in our planning and our strategies, that they're always out in front of us," Jeff said. "Whenever we are ready to take a step, every aspect of every financial instrument already is in place. We have never had to slow down, not once. How many banks can you say that about? Our goal is to make a lasting impact on communities around the world. And we take tremendous comfort in knowing that no matter where we go, Bank of America will have been there first."

Photos above (left to right): *Skookum employee Maurice Correia pursues his passion for fishing. Skookum employee and U.S. veteran Bonnie White puts her skills as a mechanic to work.*



IPG would like the power to lead an industry

Intertape Polymer Group Inc. (IPG), a manufacturer of a variety of tapes, films, protective packaging and woven products, had ambitious aspirations. Already the second-largest tape manufacturer in North America, the Montreal, Quebec- and Sarasota, Florida-based company several years ago was driving to become a global leader through multinational acquisitions, investments in manufacturing capacity, and additions to its product bundle. What IPG needed was the power to grow on an international scale — and a financial partner to help.

"Bank of America has been a key relationship for us," said IPG Chief Financial Officer Jeffrey Crystal. "They put their heart and soul into creating solutions that work."

During the course of a relationship of 10-plus years, Bank of America delivered a world of financial solutions to IPG. At the outset, when IPG faced challenges from an unsuccessful takeover attempt and economic recession in 2007, Bank of America provided an asset-based loan facility. Once IPG was on strong footing and ready to progress to a different capital structure, Bank of America provided a revolving credit facility and term loan. Over time, IPG has expanded through joint ventures and acquisitions — including operations in India — while bolstering its world-class manufacturing capacity. Bank of America supported those initiatives, leading a $250 million high-yield bond financing with a flexible leverage covenant, providing IPG the capacity for future growth while removing risk from its balance sheet. On a daily basis, services such as foreign exchange and interest rate hedging enable the global business to manage its finances effectively.

A local Bank of America relationship management team, led by Greg Banach and based near IPG's Sarasota headquarters, ensures an attentive, personalized approach to service while providing connections to resources around the world. "We've earned our strong relationship with IPG by understanding where they want to go, and bringing ideas and solutions to help them get there," Greg said. As IPG's business has evolved, teams from Global Commercial Banking, Investment Banking and other Bank of America units have worked together to deliver tailor-made solutions to advance the company's strategic plans.

"Bank of America stuck with us through a tough time early on, and consistently comes to the plate with unique ideas," Jeffrey said. "They're a great partner, whether in North America or around the world."

Caviar & Caviar USA would like the power to grow with confidence

Entrepreneur Michael Jalileyan describes Bank of America in much the same manner as top chefs, five-star hospitality groups and specialty retail outlets react after tasting the high-end caviar and smoked salmon supplied by his business: "It's almost too good to be true."

A Bank of America customer since he was a teenager, Michael never hesitated when weighing the banking needs associated with launching, nurturing and growing Caviar & Caviar USA into the top domestic supplier of caviar and specialty seafood. **"We don't even look at other banks," Michael said. "We would never need to. There are no surprises. We're simply constantly impressed."** Small business banker Marc Ramer leads a team that supports Michael, including a recent, nearly two-year search for a larger facility to house the flourishing business. Marc's extensive due diligence enabled Michael's company to identify and avoid a potentially six-figure repair issue at one site. "Michael is the client every banker wishes to have," Marc said. "Knowledgeable, engaged, enthusiastic — I am always curious to see which trend-setting innovation he plans to pursue, and how our entire range of products can assist him."

"Bank of America has tremendous size and scale," Michael said. "But the attention always feels specialized and personal. Marc deftly handles the financial aspects, leaving me free to concentrate on running and growing my business. And that's a lot off my plate."

Financing a sustainable world

A message from
Vice Chairman
Anne Finucane

Over the last several years, we have discussed with you how our focus on environmental, social and governance (ESG) principles is an essential part of how we deliver responsible growth. Our ESG leadership defines how we deploy our capital and resources, informs our business practices, and helps determine how and when we use our voice in support of our values. It also enables us to pursue growing business opportunities and manage risk associated with addressing the world's biggest environmental and social issues.

Over the next several pages, you will see highlights of our 2018 work in all of these areas. One particular area of focus has been solidifying a more formal approach to how we deploy our own capital and engage our partners on this topic to create greater impact around the world.

Today, the world is facing monumental challenges, and it is clear that potential solutions are woefully under-resourced. There is a significant gap between the capital that must be applied to global challenges and the amount that is being deployed today. This gap cannot be filled by public-sector and philanthropic capital alone; it requires private-sector engagement.

One important aspect of our ESG focus is how we can help mobilize players across the entire financial system to increase the flow of capital to address the major global challenges that are articulated by the United Nations Sustainable Development Goals (SDGs), such as affordable housing, sustainable energy, clean water and sanitation, education and health care. We refer to our efforts as Capital Deployment — an enterprise-wide initiative designed to unlock the necessary financing and investment to address these issues.

Continued financial innovation is also required to make a greater impact and spur additional private capital toward the SDGs. A key opportunity for us to stimulate additional private capital to finance sustainable development in emerging and developing markets is through an approach known as blended finance — the combination of various sources of capital to accommodate different risk tolerances and return requirements.

We are bringing together private banks, institutional and individual investors, development banks, and nonprofits to ensure more capital can be applied to a single issue or opportunity.

Every day, our teams are creating new solutions, forging new partnerships, and providing guidance and support to fuel progress. In 2019, we will continue to use our focus on responsible growth and ESG leadership to help define how we operate as a force for good in the global economy.

In 2018, we mobilized, conservatively, more than $50 billion that impacted a key subset of the SDGs.

Meeting global challenges with committed capital

Our Capital Deployment efforts aim to unlock vital financing to address our target SDGs. Highlights of our work include:

Environmental business commitment
Bank of America is leveraging resources to support clean and renewable energy around the globe. In 2018, we deployed $21.5 billion in capital to support low-carbon, sustainable business activities through lending, investing, capital raising and developing financial solutions for clients. Over the past six years, we have delivered nearly $105 billion toward our environmental business commitment to deploy $125 billion by 2025. For example, in partnership with Vivint Solar, Inc., we developed a standalone financing vehicle that allowed the company to completely recycle its working capital in a rooftop installation. This work is reshaping how the residential solar industry develops and finances rooftop solar and supports 95MWs of residential solar for the company, providing more attractive clean energy solutions for thousands of customers nationwide.

Blended Finance Catalyst Pool
In November 2018, we launched the Blended Finance Catalyst Pool, a new financing initiative to provide $60 million in capital and mobilize additional private capital to help address the SDGs. This new pool of Bank of America funding supports deals that would ordinarily fall outside of our Risk Framework, but by which, through our participation, we can drive significant leverage and impact.

In January 2019, we announced the first two projects that will benefit from this capital. We are investing $2.5 million in the $50 million LISC Charlotte Housing Investment Fund, which will support the construction of affordable housing in our headquarter city. Our investment is expected to help house more than 1,500 families. We also made a $5 million commitment to invest in the soon-to-be launched responAbility Access to Clean Power Fund, which aims to finance the expansion of off-grid, affordable solar power for residential and small businesses in sub-Saharan Africa and India. Our investment is expected to help provide clean energy to 6 million people and 6,000 small businesses in energy impoverished areas.

Addressing clean water and sanitation
In 2018, we closed on our $5 million loan to WaterEquity's WaterCredit Investment Fund 3, which immediately deployed the capital to microfinance institutions on the ground to provide loans that connect households to clean water and sanitation. This $50 million fund will impact 4.6 million people in India, Indonesia, Cambodia and the Philippines.

We also provided a $250,000 grant to GivePower Foundation to install solar-powered desalination systems, bringing safe water to communities in developing areas. Since 2015, we have delivered $1.75 million in grants to the GivePower Foundation, which has supported solar technology in over 1,800 schools and 22 community microgrids.

**Case study:
Transforming communities by empowering women**
Solar power is transforming villages across India. In 2018, we partnered with four non-governmental organizations (NGOs) in India to set up 49 solar micro-grids — electrifying 1,420 homes and 38 public institutions, including health care centers and schools. Powering the villages also empowered women in the community. With the solar panels installed, women could collect water in 20 minutes, rather than the typical three hours, which gave them more time to pursue education and employment opportunities.

Driving innovation
We work closely with many organizations to help find solutions and drive innovation in sustainability. In 2018, Bank of America was named a founding member of the Stanford Strategic Energy Alliance, which has produced a Sustainable Finance Initiative and will facilitate research and education between companies and faculty members.

We will continue to pursue capital deployment efforts that mobilize players across the entire financial system to increase the flow of capital to address major global challenges.

Photo: *Our $500,000 grant to GRID Alternatives supports the organization's SolarCorps Fellowship Program, which provides solar installation training while expanding access to solar power in underserved communities.*

Improving lives through community development

As a leader in community development, Bank of America is delivering financing solutions that build and preserve affordable housing, create jobs through economic development, and support environmentally sustainable business activity. This includes a commitment from our Community Development Banking, which deployed $4.7 billion in loans, tax credit equity investments and other real estate development solutions in 2018.

Community Development Banking remains focused on providing safe housing options, with an added emphasis on employment opportunities. Much of this effort is driven by creating affordable housing for families, seniors, students, veterans, the formerly homeless, those with special needs and other at-risk groups. In 2018, Community Development Banking financed more than 16,000 housing units — of which, over 15,000 were affordable.

Revitalizing the Jordan Downs housing project

Jordan Downs, a 1950s-era public housing development in the Watts neighborhood of Los Angeles, is being transformed through a public-private partnership involving Bank of America Merrill Lynch, the city of Los Angeles, the Los Angeles Housing Authority, nonprofit developer BRIDGE Housing, and for-profit developer Michaels Organization Development Company.

The multiyear redevelopment project encompasses construction of 1,400 new affordable housing units with new retail, a community center and parks. For the initial phase of the project, Bank of America Merrill Lynch provided $56.7 million in construction loans and $50.4 million in low-income housing tax credit (LIHTC) equity to construct 250 new affordable housing units.

Improving resident services and creating jobs are also part of the life-changing impact of Jordan Downs. The project created 65 new jobs, of which 46 were filled by Jordan Downs residents, participants in YouthBuild® and other community members. As the project continues, there will be additional opportunities for residents to apply for jobs to help rebuild their community — and build successful lives.

“We are committed to helping underserved neighborhoods become thriving communities. Community Development Banking uses a wide variety of financing solutions to help provide affordable housing, improve education and create jobs, thereby improving the quality of life for residents and creating more sustainable neighborhoods.”

Jim DeMare

Co-Head of Global FICC Trading and Head of the Commercial Real Estate Bank (CREB)

1,400

Redevelopment of Jordan Downs will include 1,400 new affordable housing units

Photo: *Raul Anaya, market president for Greater Los Angeles, is joined by Mayor Eric Garcetti and other city officials, developers, activists, and residents at the groundbreaking ceremony for the new Jordan Downs housing development. (Photo by Ted7 Photography, courtesy of BRIDGE Housing).*

A deep connection to the communities we serve

At Bank of America, we are making financial lives better through a tailored, community-centered approach that matches our products and services, jobs, and capital to meet the unique needs of our clients in low- and moderate-income (LMI) communities.

From managing daily finances to establishing good credit, we help people build their financial foundations through safe and transparent products, such as our Bank of America Advantage SafeBalance Banking™, an account that prevents overdraft fees. In the past two years, more than 400,000 Advantage SafeBalance Banking accounts have been opened, underscoring how we are connecting people to tailored products that best serve their needs.

Our community financial centers also provide convenient access to our team of professionals trained to serve our clients’ needs. In addition to being well-versed in banking resources, employees in community financial centers receive training on Better Money Habits® to share financial know-how with clients about topics such as rebuilding credit, savings and budgeting, and more.

To build pathways to economic mobility, we invest in and hire directly from the communities we serve by partnering with local nonprofit organizations to foster a diverse pipeline of talent and connect individuals to meaningful career opportunities. In June 2018, we committed to hiring 10,000 individuals from LMI neighborhoods over five years through our Pathways career development program.

We are also equipping our employees with career development tools and resources through the Academy at Bank of America, including on-boarding, mentoring and career advice, and long-term development training. Nearly 40,000 Consumer and Small Business employees participated in the training in 2018, with one-quarter moving their careers forward.

Rounding out our approach to enable economic mobility in LMI communities, loans and philanthropic investments help to finance the institutions, individuals and programs that help make neighborhoods stronger. For example, we invest in community development financial institutions (CDFIs) to extend credit to those unable to qualify for traditional loans, and we now have a $1.5 billion portfolio of loans and investments to 255 CDFIs across the United States, Puerto Rico and the District of Columbia.

Photo Above: *At the Boyle Heights Community financial center in Los Angeles, and all around the U.S., we are connecting communities to the resources they need to succeed.*

“We understand the unique challenges clients in LMI neighborhoods face managing their day-to-day finances, improving credit and building long-term financial wellness. Delivering tailored resources to these clients is an important part of our strategy because when these communities are made stronger, we all benefit.”

Dean Athanasia

President of Consumer and Small Business

Driving economic mobility and social progress

To help individuals and families achieve a more secure financial life, we have invested $2 billion of philanthropic capital over the past 10 years to advance economic mobility through the funding of workforce development and education, community development and basic needs. For example, in early 2019, the Women of Ireland Fund established the first endowment in Ireland to support charities and social enterprises seeking to enhance women's economic mobility. The €1 million, three-year fund will be matched by the Irish government to create a €2 million fund for women's workforce development programs.

Additionally, we are creating thriving communities through resources, capital deployment, and the power of our employee volunteers. This includes our free Better Money Habits financial education platform, now fully available in Spanish and English. Recent analysis indicated 1 in 4 users of Better Money Habits content and tools grew their savings by 20 percent or more.

Arts matter

We believe in the power of the arts to help economies thrive, educate and enrich societies, and create greater cultural understanding. That is why we are a leader in helping the arts flourish across the globe, supporting more than 2,000 nonprofit cultural institutions each year.

With unique programs such as Museums on Us®, Art in our Communities®, and the Bank of America Art Conservation Project, we are creating access for our customers and employees, helping art museums create revenue-generating opportunities, and conserving cultural treasures from around the world.

>2,000

nonprofit cultural institutions supported annually

Investing in young people

In 2019, as part of our broader commitment to preparing young adults for workforce success, we expanded our long-standing partnership with City Year to help students succeed in school and prepare young leaders for fulfilling careers in the United States, United Kingdom and South Africa. The collaboration represents the first time a corporate sponsor is investing in teams in all three countries where City Year operates.

Celebrating 15 years of Neighborhood Builders and creating stronger communities

To mark the 15th year of our Neighborhood Builders® program in 2018, which supports nonprofits and nonprofit leaders who address economic mobility, we expanded the number of annual program awards from 66 to 98. The awards offer selected nonprofits $200,000 in flexible funding, in-person leadership development, a network of peer organizations, and the opportunity to access capital. A complementary program, Neighborhood Champions, will be introduced in 42 new cities in 2019 to support nonprofit leadership across the U.S. Each nonprofit awardee will receive $50,000 in flexible funding and virtual leadership development for the organization.

In response to nonprofits' need to access capital for strategic growth, we've developed Capital Connections, which leverages our robust partnerships with CDFIs to connect Neighborhood Builders to low-interest loans. Recently, Habitat for Humanity® of Durham in Durham, N.C., a 2017 Neighborhood Builder awardee, secured $1.5 million in capital to expand its housing program. The organization typically builds, sells and finances 25 homes and repairs 50 homes annually, mostly in low-income areas of the city.

>$220M

Through Neighborhood Builders, we've invested more than $220 million in 1,000+ local nonprofits and provided leadership development to 2,000+ nonprofit executives since 2004.

Women play a vital role in driving the economic growth that fuels the global economy. Through our partnerships, women entrepreneurs have the power to succeed through mentoring, training and access to capital; we have helped more than 10,000 women from 80 countries grow their businesses.

Global Ambassadors Program

Through our Global Ambassadors Program, a partnership with Vital Voices, more than 160 women leaders of small businesses and social enterprises from 66 countries have been connected to mentoring and workshops to build organizational management, financial acumen and leadership skills.

Cherie Blair Foundation

We partner with the Cherie Blair Foundation on its Mentoring Women in Business program, which has matched more than 2,000 women in developing and emerging countries to online mentors, including more than 500 mentors from Bank of America.

Tory Burch Foundation Capital Program

Our $50 million investment in the Tory Burch Foundation Capital Program, which connects women business owners to affordable loans, has delivered capital through CDFIs to more than 1,800 women in 16 states.

Kiva

Through our partnership with Kiva, we are providing more than $1 million in funds to women business owners, and have assisted more than 7,200 women entrepreneurs in more than 30 countries.

The Bank of America Institute for Women's Entrepreneurship at Cornell

The Bank of America Institute for Women's Entrepreneurship at Cornell offers the only online certificate program that helps women entrepreneurs develop the skills and knowledge they need to build, manage and grow successful businesses. The institute will train 5,000 women entrepreneurs over the next four years.

Sharing our success — ESG highlights

Environmental, social and governance (ESG) principles help define how Bank of America delivers responsible, sustainable growth, how we contribute to the global economy, and how we share success with the clients and communities we serve.

Capital deployment

In 2018, we mobilized, conservatively, more than **$50 billion** that impacted a key subset of the SDGs.

Environmental business commitment

Deployed **$21.5 billion** in capital to support low-carbon, sustainable business activities through lending, investing, capital raising, and developing financial solutions for clients around the world as part of our environmental business commitment to deploy $125 billion by 2025. Since 2013, we have delivered nearly $105 billion toward this goal.

Green bonds and social bonds

Issued our fourth and largest green bond for **$2.25 billion** and issued a **$500 million** social bond — the first social bond issued by a U.S. bank.

"Our green bond and social bond programs demonstrate that the bank is truly committed to the communities we serve, while also giving us access to investors that would not typically be funding sources for a bank. Fundamentally, these are a means for society to advocate for a sustainable composition of the asset side of the balance sheet."

Andrei Magasiner
Treasurer

ESG client balances

$17.9 billion in assets with a clearly defined ESG investment approach.

CDFI lending

We originated **$200 million** in loans as part of our more than $1.5 billion investment in 255 CDFIs.

Announced a **$20 million** Veteran Entrepreneur Lending Program to connect veteran business owners with affordable capital through participating CDFIs to help grow their businesses.

Community Development Banking

Through Community Development Banking, we deployed more than **$4.7 billion** in loans, tax credit equity investments and other real estate development solutions in 2018.

Small business lending

One of the top small business lenders with **$34.7 billion** total outstanding small business loan balances as of Q3 2018, according to the FDIC.

Bank of America Art Conservation Project

Through the Bank of America Art Conservation Project, we provided grants to fund **21 conservation projects** in nine countries to conserve paintings, sculptures, and archaeological pieces that are important to cultural heritage.

Better Money Habits

In 2018, visitors to Better Money Habits home loans content were **13 times more likely** to obtain a home loan within 30 days.

In 2018, visitors to Better Money Habits college content were **five times more likely** to open a savings account within 30 days.

BetterMoneyHabits.com Spanish content has resulted in higher average time on site, up **37%,** and visitors are more likely to return to the site by 4 percentage points.

Philanthropic giving

Invested more than $200 million in philanthropic capital from the Bank of America Charitable Foundation as part of our **$2 billion, 10-year giving goal.**

Employee giving and volunteering

Last year, employees volunteered 2 million hours, and donated or pledged $23 million to causes they care about. The impact of employee giving and matching gifts from the bank totaled **$53 million** in support of the communities we serve.

Being a great place to work — 2018 highlights

A critical component of how we drive responsible growth is making Bank of America a great place to work. We deliver on our commitment to be a great place to work by recognizing and rewarding performance, ensuring an inclusive workplace for our employees around the world, creating opportunities for our employees to develop and grow, and supporting employees' physical, emotional and financial wellness.

Being an **inclusive workplace** for all of our employees around the world

- More than **50%** of our global workforce are **women** and more than **45%** of our U.S.-based workforce are **people of color**.
- Our 11 Employee Networks, with more than 250 chapters made up of over **120,000 memberships** worldwide, connect employees with shared interests and those who support them.
- **60,000+ employees have participated** in courageous conversations, group and one-on-one discussions which encourage employees to discuss topics that are important to them, like race and gender dynamics, social justice, LGBT+ equality and mental health.

Creating opportunities for employees to **grow and develop**

- In 2018, **more than 27,000 new teammates** joined our company, including more than 3,500 future leaders who were recent college graduates.
- We have invested in leading platforms, including **The Learning Hub, myLearning** and **myCareer,** to help employees develop their skills and grow their careers at Bank of America.
- **86% of eligible managers** participated in some form of manager development training in 2018.
- Our tuition reimbursement program provides employees up to **$5,250 per year** for courses related to current or future roles at our company.
- Bank of America supports employees' commitment to improving their communities, and allows individuals up to **two paid hours** per week for volunteering with nonprofit organizations.

Recognizing and **rewarding performance**

- We have been an industry leader in establishing an internal minimum rate of pay for our U.S. hourly employees and have made regular increases over many years. **Two years ago, we raised our minimum wage to $15 per hour and our minimum wage is higher today.** Our average rate for all U.S. hourly employees is significantly above this level.
- In 2017 and 2018, 90% and **95% of our employees,** respectively, shared in our success by receiving special compensation awards. We're a leader in providing this type of award for two consecutive years.
- We had **4 million+ recognition moments** (eCards given and received) in 2018. That's more than eight recognition moments every minute.

Supporting employees' **physical, emotional and financial wellness**

- There has been **no increase** in medical premiums for employees earning less than $50,000 since 2012. For higher-paid employees, the average contribution increase since 2012 has been below the national health care trend.
- On average, **85% of employees and their partners** have completed annual health screenings over the past five years; in 2018, nearly **200,000 employees, spouses/partners** completed their annual health screenings.
- In 2018, we **doubled the number of free, in-person confidential counseling sessions available** through our Employee Assistance Program for our U.S. employees and eligible family members.
- Since 2014, **85,000+ employees** have been supported by our Life Event Services team, an internal, highly specialized group providing resources, benefits, counseling and other personalized support to employees who faced major life events.
- We provide 401(k) matching contributions of up to **5% of eligible pay** after one year of service, plus 2% or 3% in annual company contributions.

We ask our teammates, too

A message from **Sheri Bronstein**
Chief Human Resources Officer

Listening to our teammates answer the question "What would you like the power to do?" has helped us shape all we do to be a great place to work. To serve our customers and communities well, we have built a great team. And we are investing in our teammates so they can deliver for our clients and customers and impact the communities where we live and work.

Our focus includes recognizing and rewarding performance, ensuring a diverse and inclusive workplace for our employees around the world, creating opportunities for our employees to develop and grow, and supporting employees' physical, emotional and financial wellness.

Rewarding our teammates' performance
We offer fair, competitive compensation based on market rates by role and performance. We regularly benchmark compensation against other companies, both within and outside our industry, to ensure our pay is competitive with comparable roles in the market.

We're committed to supporting a competitive minimum rate of pay. We have been an industry leader in establishing an internal minimum rate of pay for our U.S. hourly employees and have made regular increases over many years. Two years ago, we raised our minimum wage to $15 per hour, and our minimum wage is higher today. Our average rate for all U.S. hourly employees is significantly above this level.

For the last two years, we've shared our success with our employees through special compensation awards for approximately 90 percent and 95 percent, respectively, of our teammates globally.

We're proud to be a leader among companies providing awards of this type to our employees for two consecutive years, from cash bonuses to stock, totaling more than $1 billion. These awards were in addition to the compensation these teammates otherwise received. These awards recognize the contributions of our employees to drive responsible growth, and reflect the continuing benefits of U.S. tax reform to our company.

Bringing our whole selves to work

We are proud to be a team that mirrors the diversity of our customers, clients and communities: More than 50 percent of our global workforce are women, and more than 45 percent of our U.S.-based workforce are people of color. Our commitment comes from the top: Our CEO chairs the company's Global Diversity and Inclusion Council, which is composed of leaders representing every line of business and geography, and is responsible for setting and upholding diversity and inclusion goals and practices. And at every level, we drive a culture of inclusion through a range of programs to connect employees, executives, and thought leaders across our company, including our 11 Employee Networks with over 120,000 memberships worldwide. We also encourage our teammates to have courageous conversations, which foster inclusion, understanding, and positive action by creating awareness of employees' experiences and perspectives related to differences in background, experience or viewpoints.

Providing opportunities for development and growth

We provide resources, programs and tools to help employees develop and grow at the company. Our tuition reimbursement program provides employees up to $5,250 per year for courses related to current or future roles at our company. We also offer online learning courses, professional growth, and development of our managers through programs like Manager Excellence and access to the myCareer website to view open positions. In 2018, we helped support more than 17,000 employees find new roles within the company, and we had historically low employee turnover.

Supporting wellness

We support the physical, emotional and financial wellness of our teammates by providing quality health care with annual premium increases below the national U.S. average. We offer health care coverage for all U.S. benefits-eligible employees that costs them no more than 7 percent of their wages. We also provide industry-leading benefits such as 16 weeks of paid parental leave — maternity, paternity, and adoption; 20 days of paid bereavement leave for full-time employees who lose a spouse, partner or child; and confidential counseling through our Employee Assistance Program. And for the moments when employees and their families need support the most, our internal, highly specialized Life Event Services (LES) group provides personalized support to them. More than 85,000 team members have worked with the highly trained and empathetic LES team members for needs around survivor support, domestic violence, natural and man-made disasters, transition related to military service, and other major life events. The team provides resources, benefits, counseling and other support, tapping experts inside and outside the company. Overall, employee satisfaction with our benefits is at an all-time high. You can read more about our benefits, resources and programs on the previous page.

We are proud that others have recognized us for our focus on our teammates. For instance, Euromoney recognized us as the World's Best Bank for Diversity and Inclusion, and we were awarded the 2019 Catalyst Award for our innovative organizational efforts to advance women in the workplace. We were also named as one of the 100 Best Companies to Work For by Fortune magazine and the global research and consulting firm, Great Place to Work® for our focus on being a great place to work and delivering value for our customers and clients, and named as the only financial services company on Fortune's inaugural Best Big Companies to Work For list, which recognized seven companies with more than 100,000 U.S.-based employees that passed the Great Place to Work Certification bar. You can read more about the external recognition we have received in our proxy statement.

We had one of our best years ever in 2018: strong recognition for customer service in every category, the highest levels of customer satisfaction, and record financial results that allowed us to keep investing in how we serve our clients and customers. We attracted more than 27,000 new teammates to our company, including more than 3,500 future leaders who were recent college graduates. Our teammates' consistent commitment to our purpose allows us to deliver for our customers, communities and shareholders. Our commitment to our teammates is demonstrated by our continued investment in making Bank of America a great place to work.

Sheri Bronstein

Bank of America Corporation — Financial Highlights

Bank of America Corporation (NYSE: BAC) is headquartered in Charlotte, North Carolina. As of December 31, 2018, we operated in all 50 states, the District of Columbia, the U.S. Virgin Islands, Puerto Rico and more than 35 countries. Through our banking and various nonbank subsidiaries throughout the United States and in international markets, we provide a diversified range of banking and nonbank financial services and products through four business segments: Consumer Banking, Global Wealth and Investment Management, Global Banking, and Global Markets.

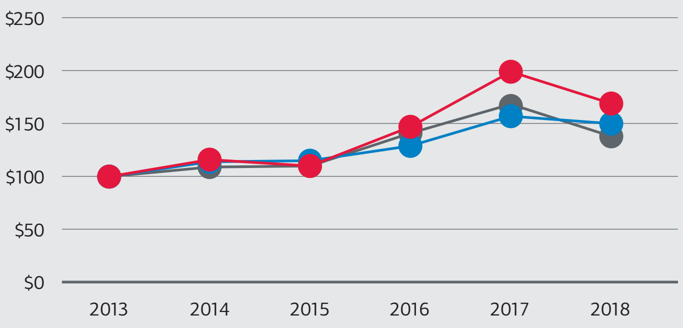
Financial Highlights ($ in millions, except per share information)

For the year	2018	2017	2016
Revenue, net of interest expense	$ 91,247	$ 87,352	$ 83,701
Net income	28,147	18,232	17,822
Earnings per common share	2.64	1.63	1.57
Diluted earnings per common share	2.61	1.56	1.49
Dividends paid per common share	0.54	0.39	0.25
Return on average assets	1.21%	0.80%	0.81%
Return on average tangible common shareholders' equity [1]	15.55	9.41	9.51
Efficiency ratio	58.50	62.67	65.81
Average diluted common shares issued and outstanding	10,237	10,778	11,047

At year-end	2018	2017	2016
Total loans and leases	$ 946,895	$ 936,749	$ 906,683
Total assets	2,354,507	2,281,234	2,188,067
Total deposits	1,381,476	1,309,545	1,260,934
Total shareholders' equity	265,325	267,146	266,195
Book value per common share	25.13	23.80	23.97
Tangible book value per common share [1]	17.91	16.96	16.89
Market price per common share	24.64	29.52	22.10
Common shares issued and outstanding	9,669	10,287	10,053
Tangible common equity ratio [1]	7.6%	7.9%	8.0%

[1]Represents a non-GAAP financial measure. For more information on these measures and ratios, and a corresponding reconciliation to GAAP financial measures, see Supplemental Financial Data on page 39 and Non-GAAP Reconciliations on page 40 of the 2018 Financial Review section.

Total Cumulative Shareholder Return[2]



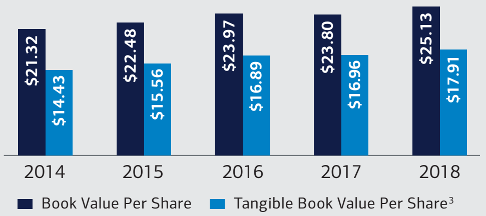
December 31	2013	2014	2015	2016	2017	2018
Bank of America Corporation	$100	$116	$110	$147	$199	$169
S&P 500	100	114	115	129	157	150
KBW Bank Sector Index	100	109	110	141	167	138

[2]This graph compares the yearly change in the Corporation's total cumulative shareholder return on its common stock with (i) the Standard & Poor's 500 Index and (ii) the KBW Bank Index for the years ended December 31, 2013 through 2018. The graph assumes an initial investment of $100 at the end of 2013 and the reinvestment of all dividends during the years indicated.

BAC Five-Year Stock Performance

	2014	2015	2016	2017	2018
HIGH	$18.13	$18.45	$23.16	$29.88	$32.84
LOW	14.51	15.15	11.16	22.05	22.73
▲ CLOSE	17.89	16.83	22.10	29.52	24.64

Book Value Per Share/ Tangible Book Value Per Share



[3]Tangible book value per share is a non-GAAP financial measure.

2018 Financial Review

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

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

You should not place undue reliance on any forward-looking statement and should consider the following uncertainties and risks, as well as the risks and uncertainties more fully discussed under Item 1A. Risk Factors of our 2018 Annual Report on Form 10-K: the Corporation's potential claims, damages, penalties, fines and reputational damage resulting from pending or future litigation, regulatory proceedings and enforcement actions and the possibility that amounts may be in excess of the Corporation's recorded liability and estimated range of possible loss for litigation and regulatory exposures; the possibility that the Corporation could face increased servicing, securities, fraud, indemnity, contribution or other claims from one or more counterparties, including trustees, purchasers of loans, underwriters, issuers, other parties involved in securitizations, monolines or private-label and other investors; the possibility that future representations and warranties losses may occur in excess of the Corporation's recorded liability and estimated range of possible loss for its representations and warranties exposures; the Corporation's ability to resolve representations and warranties repurchase and related claims, including claims brought by investors or trustees seeking to avoid the statute of limitations for repurchase claims; the risks related to the discontinuation of the London InterBank Offered Rate and other reference rates, including increased expenses and litigation and the effectiveness of hedging strategies; uncertainties about the financial stability and growth rates of non-U.S. jurisdictions, the risk that those jurisdictions may face difficulties servicing their sovereign debt, and related stresses on financial markets, currencies and trade, and the Corporation's exposures to such risks, including direct, indirect and operational; the impact of U.S. and global interest rates, inflation, currency exchange rates, economic conditions, trade policies, including tariffs, and potential geopolitical instability; the impact on the Corporation's business, financial condition and results of operations of a potential higher interest rate environment; the possibility that future credit losses may be higher than currently expected due to changes in economic assumptions, customer behavior, adverse developments with respect to U.S. or global economic conditions and other uncertainties; the Corporation's ability to achieve its expense targets and expectations regarding net interest income, net charge-offs, loan growth or other projections; adverse changes to the Corporation's credit ratings from the major credit rating agencies; an inability to access capital markets or maintain deposits; estimates of the fair value and other accounting values, subject to impairment assessments, of certain of the Corporation's assets and liabilities; uncertainty regarding the content, timing and impact of regulatory capital and liquidity requirements; the impact of adverse changes to total loss-absorbing capacity requirements and/or global systemically important bank surcharges; the success of our reorganization of Merrill Lynch, Pierce, Fenner & Smith Incorporated; the potential impact of actions of the Board of Governors of the Federal Reserve System on the Corporation's capital plans; the effect of regulations, other guidance or additional information on the impact from the Tax Cuts and Jobs Act; the impact of implementation and compliance with U.S. and international laws, regulations and regulatory interpretations, including, but not limited to, recovery and resolution planning requirements, Federal Deposit Insurance Corporation assessments, the Volcker Rule, fiduciary standards and derivatives regulations; a failure in or breach of the Corporation's operational or security systems or infrastructure, or those of third parties, including as a result of cyber-attacks; the impact on the Corporation's business, financial condition and results of operations from the planned exit of the United Kingdom from the European Union; the impact of a prolonged federal government shutdown and uncertainty regarding the federal government's debt limit; and other similar matters.

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

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

Executive Summary

Business Overview

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

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

Recent Developments

Capital Management

During 2018, we repurchased $20.1 billion of common stock pursuant to the Board of Directors' (the Board) repurchase authorizations under our 2018 and 2017 Comprehensive Capital Analysis and Review (CCAR) plans, including repurchases to offset equity-based compensation awards. Also, in addition to the previously announced repurchases associated with the 2018 CCAR capital plan, on February 7, 2019, we announced a plan to repurchase an additional $2.5 billion of common stock through June 30, 2019, which was approved by the Board of Governors of the Federal Reserve System (Federal Reserve). For additional information, see Capital Management on page 58.

U.K. Exit from the EU

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

LIBOR and Other Benchmark Rates

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

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

Financial Highlights

Table 1 Summary Income Statement and Selected Financial Data

(Dollars in millions, except per share information)	2018	2017
Income statement		
Net interest income	$ 47,432	$ 44,667
Noninterest income	43,815	42,685
Total revenue, net of interest expense	91,247	87,352
Provision for credit losses	3,282	3,396
Noninterest expense	53,381	54,743
Income before income taxes	34,584	29,213
Income tax expense	6,437	10,981
Net income	28,147	18,232
Preferred stock dividends	1,451	1,614
Net income applicable to common	$ 26,696	$ 16,618
Per common share information		
Earnings	$ 2.64	$ 1.63
Diluted earnings	2.61	1.56
Dividends paid	0.54	0.39
Performance ratios		
Return on average assets	1.21%	0.80%
Return on average common shareholders' equity	11.04	6.72
Return on average tangible common shareholders' equity [1]	15.55	9.41
Efficiency ratio	58.50	62.67
Balance sheet at year end		
Total loans and leases	$ 946,895	$ 936,749
Total assets	2,354,507	2,281,234
Total deposits	1,381,476	1,309,545
Total common shareholders' equity	242,999	244,823
Total shareholders' equity	265,325	267,146

(1) Return on average tangible common shareholders' equity is a non-GAAP financial measure. For more information and a corresponding reconciliation to accounting principles generally accepted in the United States of America (GAAP) financial measures, see Non-GAAP Reconciliations on page 40.

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

Net Interest Income

Net interest income increased $2.8 billion to $47.4 billion in 2018 compared to 2017. Net interest yield on a fully taxable-equivalent (FTE) basis increased five basis points (bps) to 2.42 percent for 2018. These increases were primarily driven by higher interest rates as well as loan and deposit growth, partially offset by tightening spreads, higher *Global Markets* funding costs and the impact of the sale of the non-U.S. consumer credit card business in 2017. For more information on net interest yield and the FTE basis, see Supplemental Financial Data on page 39, and for more information on interest rate risk management, see Interest Rate Risk Management for the Banking Book on page 89.

Noninterest Income

Table 2 Noninterest Income

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

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

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

Provision for Credit Losses

The provision for credit losses decreased $114 million to $3.3 billion in 2018 compared to 2017, primarily reflecting a 2017 single-name non-U.S. commercial charge-off and improvement in the commercial portfolio. In the consumer portfolio, the impact of the sale of the non-U.S. consumer credit card business in 2017 was more than offset by a slower pace of improvement in the consumer real estate portfolio, and portfolio seasoning and loan growth in the U.S. credit card portfolio. For more information on the provision for credit losses, see Provision for Credit Losses on page 82.

Noninterest Expense

Table 3 Noninterest Expense

(Dollars in millions)	2018	2017
Personnel	$ 31,880	$ 31,931
Occupancy	4,066	4,009
Equipment	1,705	1,692
Marketing	1,674	1,746
Professional fees	1,699	1,888
Data processing	3,222	3,139
Telecommunications	699	699
Other general operating	8,436	9,639
Total noninterest expense	$ 53,381	$ 54,743

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

Income Tax Expense

Table 4 Income Tax Expense

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

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

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

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

Balance Sheet Overview

Table 5 Selected Balance Sheet Data

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

Assets

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

Cash and Cash Equivalents

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

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

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

Trading Account Assets

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

Debt Securities

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

Loans and Leases

Loans and leases increased $10.1 billion primarily due to net loan growth driven by client demand for commercial loans and increases in residential mortgage. For more information on the loan portfolio, see Credit Risk Management on page 66.

Allowance for Loan and Lease Losses

The allowance for loan and lease losses decreased $792 million primarily due to the impact of improvements in credit quality from a stronger economy and continued runoff and sales in the non-core consumer real estate portfolio. For additional information, see Allowance for Credit Losses on page 82.

Liabilities

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

Deposits

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

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

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

Trading Account Liabilities

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

Short-term Borrowings

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

Long-term Debt

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

Shareholders' Equity

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

Cash Flows Overview

The Corporation's operating assets and liabilities support our global markets and lending activities. We believe that cash flows from operations, available cash balances and our ability to generate cash through short- and long-term debt are sufficient to fund our operating liquidity needs. Our investing activities primarily include the debt securities portfolio and loans and leases. Our financing activities reflect cash flows primarily related to customer deposits, securities financing agreements and long-term debt. For more information on liquidity, see Liquidity Risk on page 62.

Supplemental Financial Data

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

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

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

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

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

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

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

Non-GAAP Reconciliations

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

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

(Dollars in millions, shares in thousands)	2018	2017	2016	2015	2014
Reconciliation of average shareholders' equity to average tangible shareholders' equity and average tangible common shareholders' equity					
Shareholders' equity	**$ 264,748**	$ 271,289	$ 265,843	$ 251,384	$ 238,317
Goodwill	**(68,951)**	(69,286)	(69,750)	(69,772)	(69,809)
Intangible assets (excluding MSRs)	**(2,058)**	(2,652)	(3,382)	(4,201)	(5,109)
Related deferred tax liabilities	**906**	1,463	1,644	1,852	2,090
Tangible shareholders' equity	**$ 194,645**	$ 200,814	$ 194,355	$ 179,263	$ 165,489
Preferred stock	**(22,949)**	(24,188)	(24,656)	(21,808)	(15,410)
Tangible common shareholders' equity	**$ 171,696**	$ 176,626	$ 169,699	$ 157,455	$ 150,079
Reconciliation of year-end shareholders' equity to year-end tangible shareholders' equity and year-end tangible common shareholders' equity					
Shareholders' equity	**$ 265,325**	$ 267,146	$ 266,195	$ 255,615	$ 243,476
Goodwill	**(68,951)**	(68,951)	(69,744)	(69,761)	(69,777)
Intangible assets (excluding MSRs)	**(1,774)**	(2,312)	(2,989)	(3,768)	(4,612)
Related deferred tax liabilities	**858**	943	1,545	1,716	1,960
Tangible shareholders' equity	**$ 195,458**	$ 196,826	$ 195,007	$ 183,802	$ 171,047
Preferred stock	**(22,326)**	(22,323)	(25,220)	(22,272)	(19,309)
Tangible common shareholders' equity	**$ 173,132**	$ 174,503	$ 169,787	$ 161,530	$ 151,738
Reconciliation of year-end assets to year-end tangible assets					
Assets	**$ 2,354,507**	$ 2,281,234	$ 2,188,067	$ 2,144,606	$ 2,104,539
Goodwill	**(68,951)**	(68,951)	(69,744)	(69,761)	(69,777)
Intangible assets (excluding MSRs)	**(1,774)**	(2,312)	(2,989)	(3,768)	(4,612)
Related deferred tax liabilities	**858**	943	1,545	1,716	1,960
Tangible assets	**$ 2,284,640**	$ 2,210,914	$ 2,116,879	$ 2,072,793	$ 2,032,110

[1] Presents reconciliations of non-GAAP financial measures to GAAP financial measures. For more information on non-GAAP financial measures and ratios we use in assessing the results of the Corporation, see Supplemental Financial Data on page 39.

Table 7 Quarterly Reconciliations to GAAP Financial Measures [1]

	2018 Quarters				2017 Quarters			
(Dollars in millions)	Fourth	Third	Second	First	Fourth	Third	Second	First
Reconciliation of average shareholders' equity to average tangible shareholders' equity and average tangible common shareholders' equity								
Shareholders' equity	**$ 263,698**	$ 264,653	$ 265,181	$ 265,480	$ 273,162	$ 273,238	$ 270,977	$ 267,700
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,954)	(68,969)	(69,489)	(69,744)
Intangible assets (excluding MSRs)	**(1,857)**	(1,992)	(2,126)	(2,261)	(2,399)	(2,549)	(2,743)	(2,923)
Related deferred tax liabilities	**874**	896	916	939	1,344	1,465	1,506	1,539
Tangible shareholders' equity	**$ 193,764**	$ 194,606	$ 195,020	$ 195,207	$ 203,153	$ 203,185	$ 200,251	$ 196,572
Preferred stock	**(22,326)**	(22,841)	(23,868)	(22,767)	(22,324)	(24,024)	(25,221)	(25,220)
Tangible common shareholders' equity	**$ 171,438**	$ 171,765	$ 171,152	$ 172,440	$ 180,829	$ 179,161	$ 175,030	$ 171,352
Reconciliation of period-end shareholders' equity to period-end tangible shareholders' equity and period-end tangible common shareholders' equity								
Shareholders' equity	**$ 265,325**	$ 262,158	$ 264,216	$ 266,224	$ 267,146	$ 271,969	$ 270,660	$ 267,990
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,968)	(68,969)	(69,744)
Intangible assets (excluding MSRs)	**(1,774)**	(1,908)	(2,043)	(2,177)	(2,312)	(2,459)	(2,610)	(2,827)
Related deferred tax liabilities	**858**	878	900	920	943	1,435	1,471	1,513
Tangible shareholders' equity	**$ 195,458**	$ 192,177	$ 194,122	$ 196,016	$ 196,826	$ 201,977	$ 200,552	$ 196,932
Preferred stock	**(22,326)**	(22,326)	(23,181)	(24,672)	(22,323)	(22,323)	(25,220)	(25,220)
Tangible common shareholders' equity	**$ 173,132**	$ 169,851	$ 170,941	$ 171,344	$ 174,503	$ 179,654	$ 175,332	$ 171,712
Reconciliation of period-end assets to period-end tangible assets								
Assets	**$ 2,354,507**	$ 2,338,833	$ 2,291,670	$ 2,328,478	$ 2,281,234	$ 2,284,174	$ 2,254,714	$ 2,247,794
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,968)	(68,969)	(69,744)
Intangible assets (excluding MSRs)	**(1,774)**	(1,908)	(2,043)	(2,177)	(2,312)	(2,459)	(2,610)	(2,827)
Related deferred tax liabilities	**858**	878	900	920	943	1,435	1,471	1,513
Tangible assets	**$ 2,284,640**	$ 2,268,852	$ 2,221,576	$ 2,258,270	$ 2,210,914	$ 2,214,182	$ 2,184,606	$ 2,176,736

[1] Presents reconciliations of non-GAAP financial measures to GAAP financial measures. For more information on non-GAAP financial measures and ratios we use in assessing the results of the Corporation, see Supplemental Financial Data on page 39.

Table 8 Five-year Summary of Selected Financial Data

(In millions, except per share information)	2018	2017	2016	2015	2014
Income statement					
Net interest income	$ 47,432	$ 44,667	$ 41,096	$ 38,958	$ 40,779
Noninterest income	43,815	42,685	42,605	44,007	45,115
Total revenue, net of interest expense	91,247	87,352	83,701	82,965	85,894
Provision for credit losses	3,282	3,396	3,597	3,161	2,275
Noninterest expense	53,381	54,743	55,083	57,617	75,656
Income before income taxes	34,584	29,213	25,021	22,187	7,963
Income tax expense	6,437	10,981	7,199	6,277	2,443
Net income	28,147	18,232	17,822	15,910	5,520
Net income applicable to common shareholders	26,696	16,618	16,140	14,427	4,476
Average common shares issued and outstanding	10,096.5	10,195.6	10,284.1	10,462.3	10,527.8
Average diluted common shares issued and outstanding	10,236.9	10,778.4	11,046.8	11,236.2	10,584.5
Performance ratios					
Return on average assets	1.21%	0.80%	0.81%	0.74%	0.26%
Return on average common shareholders' equity	11.04	6.72	6.69	6.28	2.01
Return on average tangible common shareholders' equity [(1)]	15.55	9.41	9.51	9.16	2.98
Return on average shareholders' equity	10.63	6.72	6.70	6.33	2.32
Return on average tangible shareholders' equity [(1)]	14.46	9.08	9.17	8.88	3.34
Total ending equity to total ending assets	11.27	11.71	12.17	11.92	11.57
Total average equity to total average assets	11.39	11.96	12.14	11.64	11.11
Dividend payout	20.31	24.24	15.94	14.49	28.20
Per common share data					
Earnings	$ 2.64	$ 1.63	$ 1.57	$ 1.38	$ 0.43
Diluted earnings	2.61	1.56	1.49	1.31	0.42
Dividends paid	0.54	0.39	0.25	0.20	0.12
Book value	25.13	23.80	23.97	22.48	21.32
Tangible book value [(1)]	17.91	16.96	16.89	15.56	14.43
Market capitalization	$ 238,251	$ 303,681	$ 222,163	$ 174,700	$ 188,141
Average balance sheet					
Total loans and leases	$ 933,049	$ 918,731	$ 900,433	$ 876,787	$ 898,703
Total assets	2,325,246	2,268,633	2,190,218	2,160,536	2,145,393
Total deposits	1,314,941	1,269,796	1,222,561	1,155,860	1,124,207
Long-term debt	230,693	225,133	228,617	240,059	253,607
Common shareholders' equity	241,799	247,101	241,187	229,576	222,907
Total shareholders' equity	264,748	271,289	265,843	251,384	238,317
Asset quality [(2)]					
Allowance for credit losses [(3)]	$ 10,398	$ 11,170	$ 11,999	$ 12,880	$ 14,947
Nonperforming loans, leases and foreclosed properties [(4)]	5,244	6,758	8,084	9,836	12,629
Allowance for loan and lease losses as a percentage of total loans and leases outstanding [(4)]	1.02%	1.12%	1.26%	1.37%	1.66%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases [(4)]	194	161	149	130	121
Net charge-offs [(5)]	$ 3,763	$ 3,979	$ 3,821	$ 4,338	$ 4,383
Net charge-offs as a percentage of average loans and leases outstanding [(4, 5)]	0.41%	0.44%	0.43%	0.50%	0.49%
Capital ratios at year end [(6)]					
Common equity tier 1 capital	11.6%	11.5%	10.8%	9.8%	9.6%
Tier 1 capital	13.2	13.0	12.4	11.2	11.0
Total capital	15.1	14.8	14.2	12.8	12.7
Tier 1 leverage	8.4	8.6	8.8	8.4	7.8
Supplementary leverage ratio	6.8	n/a	n/a	n/a	n/a
Tangible equity [(1)]	8.6	8.9	9.2	8.9	8.4
Tangible common equity [(1)]	7.6	7.9	8.0	7.8	7.5

(1) Tangible equity ratios and tangible book value per share of common stock are non-GAAP financial measures. For more information on these ratios and corresponding reconciliations to GAAP financial measures, see Supplemental Financial Data on page 39.

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

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

(4) Balances and ratios do not include loans accounted for under the fair value option. For additional exclusions from nonperforming loans, leases and foreclosed properties, see Consumer Portfolio Credit Risk Management – Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity on page 73 and corresponding Table 31 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 78 and corresponding Table 38.

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

(6) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased-in as of January 1, 2018. Prior periods are presented on a fully phased-in basis. For additional information, including which approach is used to assess capital adequacy, see Capital Management on page 58.

n/a = not applicable

Table 9 Selected Quarterly Financial Data

(In millions, except per share information)	2018 Quarters				2017 Quarters			
	Fourth	Third	Second	First	Fourth	Third	Second	First
Income statement								
Net interest income	**$ 12,304**	$ 11,870	$ 11,650	$ 11,608	$ 11,462	$ 11,161	$ 10,986	$ 11,058
Noninterest income [(1)]	**10,432**	10,907	10,959	11,517	8,974	10,678	11,843	11,190
Total revenue, net of interest expense	**22,736**	22,777	22,609	23,125	20,436	21,839	22,829	22,248
Provision for credit losses	**905**	716	827	834	1,001	834	726	835
Noninterest expense	**13,133**	13,067	13,284	13,897	13,274	13,394	13,982	14,093
Income before income taxes	**8,698**	8,994	8,498	8,394	6,161	7,611	8,121	7,320
Income tax expense [(1)]	**1,420**	1,827	1,714	1,476	3,796	2,187	3,015	1,983
Net income [(1)]	**7,278**	7,167	6,784	6,918	2,365	5,424	5,106	5,337
Net income applicable to common shareholders	**7,039**	6,701	6,466	6,490	2,079	4,959	4,745	4,835
Average common shares issued and outstanding	**9,855.8**	10,031.6	10,181.7	10,322.4	10,470.7	10,197.9	10,013.5	10,099.6
Average diluted common shares issued and outstanding	**9,996.0**	10,170.8	10,309.4	10,472.7	10,621.8	10,746.7	10,834.8	10,919.7
Performance ratios								
Return on average assets	**1.24%**	1.23%	1.17%	1.21%	0.41%	0.95%	0.90%	0.97%
Four-quarter trailing return on average assets [(2)]	**1.21**	1.00	0.93	0.86	0.80	0.91	0.89	0.88
Return on average common shareholders' equity	**11.57**	10.99	10.75	10.85	3.29	7.89	7.75	8.09
Return on average tangible common shareholders' equity [(3)]	**16.29**	15.48	15.15	15.26	4.56	10.98	10.87	11.44
Return on average shareholders' equity	**10.95**	10.74	10.26	10.57	3.43	7.88	7.56	8.09
Return on average tangible shareholders' equity [(3)]	**14.90**	14.61	13.95	14.37	4.62	10.59	10.23	11.01
Total ending equity to total ending assets	**11.27**	11.21	11.53	11.43	11.71	11.91	12.00	11.92
Total average equity to total average assets	**11.30**	11.42	11.42	11.41	11.87	12.03	11.94	12.00
Dividend payout	**20.90**	22.35	18.83	19.06	60.35	25.59	15.78	15.64
Per common share data								
Earnings	**$ 0.71**	$ 0.67	$ 0.64	$ 0.63	$ 0.20	$ 0.49	$ 0.47	$ 0.48
Diluted earnings	**0.70**	0.66	0.63	0.62	0.20	0.46	0.44	0.45
Dividends paid	**0.15**	0.15	0.12	0.12	0.12	0.12	0.075	0.075
Book value	**25.13**	24.33	24.07	23.74	23.80	23.87	24.85	24.34
Tangible book value [(3)]	**17.91**	17.23	17.07	16.84	16.96	17.18	17.75	17.22
Market capitalization	**$ 238,251**	$ 290,424	$ 282,259	$ 305,176	$ 303,681	$ 264,992	$ 239,643	$ 235,291
Average balance sheet								
Total loans and leases	**$ 934,721**	$ 930,736	$ 934,818	$ 931,915	$ 927,790	$ 918,129	$ 914,717	$ 914,144
Total assets	**2,334,586**	2,317,829	2,322,678	2,325,878	2,301,687	2,271,104	2,269,293	2,231,649
Total deposits	**1,344,951**	1,316,345	1,300,659	1,297,268	1,293,572	1,271,711	1,256,838	1,256,632
Long-term debt	**230,616**	233,475	229,037	229,603	227,644	227,309	224,019	221,468
Common shareholders' equity	**241,372**	241,812	241,313	242,713	250,838	249,214	245,756	242,480
Total shareholders' equity	**263,698**	264,653	265,181	265,480	273,162	273,238	270,977	267,700
Asset quality [(4)]								
Allowance for credit losses [(5)]	**$ 10,398**	$ 10,526	$ 10,837	$ 11,042	$ 11,170	$ 11,455	$ 11,632	$ 11,869
Nonperforming loans, leases and foreclosed properties [(6)]	**5,244**	5,449	6,181	6,694	6,758	6,869	7,127	7,637
Allowance for loan and lease losses as a percentage of total loans and leases outstanding [(6)]	**1.02%**	1.05%	1.08%	1.11%	1.12%	1.16%	1.20%	1.25%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases [(6)]	**194**	189	170	161	161	163	160	156
Net charge-offs [(7)]	**$ 924**	$ 932	$ 996	$ 911	$ 1,237	$ 900	$ 908	$ 934
Annualized net charge-offs as a percentage of average loans and leases outstanding [(6, 7)]	**0.39%**	0.40%	0.43%	0.40%	0.53%	0.39%	0.40%	0.42%
Capital ratios at period end [(8)]								
Common equity tier 1 capital	**11.6%**	11.4%	11.4%	11.3%	11.5%	11.9%	11.5%	11.0%
Tier 1 capital	**13.2**	12.9	13.0	13.0	13.0	13.4	13.2	12.6
Total capital	**15.1**	14.7	14.8	14.8	14.8	15.1	15.0	14.3
Tier 1 leverage	**8.4**	8.3	8.4	8.4	8.6	8.9	8.8	8.8
Supplementary leverage ratio	**6.8**	6.7	6.7	6.8	n/a	n/a	n/a	n/a
Tangible equity [(3)]	**8.6**	8.5	8.7	8.7	8.9	9.1	9.2	9.1
Tangible common equity [(3)]	**7.6**	7.5	7.7	7.6	7.9	8.1	8.0	7.9

(1) Net income for the fourth quarter of 2017 included a charge of $2.9 billion related to the Tax Act effects which consisted of $946 million in noninterest income and $1.9 billion in income tax expense.
(2) Calculated as total net income for four consecutive quarters divided by annualized average assets for four consecutive quarters.
(3) Tangible equity ratios and tangible book value per share of common stock are non-GAAP financial measures. For more information on these ratios and corresponding reconciliations to GAAP financial measures, see Supplemental Financial Data on page 39.
(4) Asset quality metrics include $31 million of non-U.S. consumer credit card net charge-offs for the second quarter of 2017 and $242 million of non-U.S. consumer credit card allowance for loan and lease losses, $9.5 billion of non-U.S. consumer credit card loans and $44 million of non-U.S. consumer credit card net charge-offs for the first quarter of 2017. The Corporation sold its non-U.S. consumer credit card business in the second quarter of 2017.
(5) Includes the allowance for loan and lease losses and the reserve for unfunded lending commitments.
(6) Balances and ratios do not include loans accounted for under the fair value option. For additional exclusions from nonperforming loans, leases and foreclosed properties, see Consumer Portfolio Credit Risk Management – Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity on page 73 and corresponding Table 31 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 78 and corresponding Table 38.
(7) Net charge-offs exclude $107 million, $95 million, $36 million and $35 million of write-offs in the PCI loan portfolio in the fourth, third, second and first quarters of 2018, and $46 million, $73 million, $55 million and $33 million in the fourth, third, second and first quarters of 2017, respectively.
(8) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased-in as of January 1, 2018. Prior periods are presented on a fully phased-in basis. For additional information, including which approach is used to assess capital adequacy, see Capital Management on page 58.
n/a = not applicable

Table 10 Average Balances and Interest Rates - FTE Basis

(Dollars in millions)	Average Balance	Interest Income/ Expense	Yield/ Rate	Average Balance	Interest Income/ Expense	Yield/ Rate	Average Balance	Interest Income/ Expense	Yield/ Rate
	2018			2017			2016		
Earning assets									
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	**$ 139,848**	**$ 1,926**	**1.38%**	$ 127,431	$ 1,122	0.88%	$ 133,374	$ 605	0.45%
Time deposits placed and other short-term investments	**9,446**	**216**	**2.29**	12,112	241	1.99	9,026	140	1.55
Federal funds sold and securities borrowed or purchased under agreements to resell [1]	**251,328**	**3,176**	**1.26**	222,818	1,806	0.81	216,161	967	0.45
Trading account assets	**132,724**	**4,901**	**3.69**	129,007	4,618	3.58	129,766	4,563	3.52
Debt securities	**437,312**	**11,837**	**2.66**	435,005	10,626	2.44	418,289	9,263	2.23
Loans and leases [2]:									
Residential mortgage	**207,523**	**7,294**	**3.51**	197,766	6,831	3.45	188,250	6,488	3.45
Home equity	**53,886**	**2,573**	**4.77**	62,260	2,608	4.19	71,760	2,713	3.78
U.S. credit card	**94,612**	**9,579**	**10.12**	91,068	8,791	9.65	87,905	8,170	9.29
Non-U.S. credit card [3]	**—**	**—**	**—**	3,929	358	9.12	9,527	926	9.72
Direct/Indirect and other consumer [4]	**93,036**	**3,104**	**3.34**	96,002	2,734	2.85	94,148	2,371	2.52
Total consumer	**449,057**	**22,550**	**5.02**	451,025	21,322	4.73	451,590	20,668	4.58
U.S. commercial	**304,387**	**11,937**	**3.92**	292,452	9,765	3.34	276,887	8,101	2.93
Non-U.S. commercial	**97,664**	**3,220**	**3.30**	95,005	2,566	2.70	93,263	2,337	2.51
Commercial real estate [5]	**60,384**	**2,618**	**4.34**	58,502	2,116	3.62	57,547	1,773	3.08
Commercial lease financing	**21,557**	**698**	**3.24**	21,747	706	3.25	21,146	627	2.97
Total commercial	**483,992**	**18,473**	**3.82**	467,706	15,153	3.24	448,843	12,838	2.86
Total loans and leases [3]	**933,049**	**41,023**	**4.40**	918,731	36,475	3.97	900,433	33,506	3.72
Other earning assets [1]	**76,524**	**4,300**	**5.62**	76,957	3,224	4.19	59,775	2,496	4.18
Total earning assets [1,6]	**1,980,231**	**67,379**	**3.40**	1,922,061	58,112	3.02	1,866,824	51,540	2.76
Cash and due from banks	**25,830**			27,995			27,893		
Other assets, less allowance for loan and lease losses	**319,185**			318,577			295,501		
Total assets	**$ 2,325,246**			$ 2,268,633			$ 2,190,218		
Interest-bearing liabilities									
U.S. interest-bearing deposits:									
Savings	**$ 54,226**	**$ 6**	**0.01%**	$ 53,783	$ 5	0.01%	$ 49,495	$ 5	0.01%
NOW and money market deposit accounts	**676,382**	**2,636**	**0.39**	628,647	873	0.14	589,737	294	0.05
Consumer CDs and IRAs	**39,823**	**157**	**0.39**	44,794	121	0.27	48,594	133	0.27
Negotiable CDs, public funds and other deposits	**50,593**	**991**	**1.96**	36,782	354	0.96	32,889	160	0.49
Total U.S. interest-bearing deposits	**821,024**	**3,790**	**0.46**	764,006	1,353	0.18	720,715	592	0.08
Non-U.S. interest-bearing deposits:									
Banks located in non-U.S. countries	**2,312**	**39**	**1.69**	2,442	21	0.85	3,891	32	0.82
Governments and official institutions	**810**	**—**	**0.01**	1,006	10	0.95	1,437	9	0.64
Time, savings and other	**65,097**	**666**	**1.02**	62,386	547	0.88	59,183	382	0.65
Total non-U.S. interest-bearing deposits	**68,219**	**705**	**1.03**	65,834	578	0.88	64,511	423	0.66
Total interest-bearing deposits	**889,243**	**4,495**	**0.51**	829,840	1,931	0.23	785,226	1,015	0.13
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities [1]	**269,748**	**5,839**	**2.17**	274,975	3,146	1.14	252,585	1,933	0.77
Trading account liabilities	**50,928**	**1,358**	**2.67**	45,518	1,204	2.64	37,897	1,018	2.69
Long-term debt	**230,693**	**7,645**	**3.31**	225,133	6,239	2.77	228,617	5,578	2.44
Total interest-bearing liabilities [1,6]	**1,440,612**	**19,337**	**1.34**	1,375,466	12,520	0.91	1,304,325	9,544	0.73
Noninterest-bearing sources:									
Noninterest-bearing deposits	**425,698**			439,956			437,335		
Other liabilities [1]	**194,188**			181,922			182,715		
Shareholders' equity	**264,748**			271,289			265,843		
Total liabilities and shareholders' equity	**$ 2,325,246**			$ 2,268,633			$ 2,190,218		
Net interest spread			**2.06%**			2.11%			2.03%
Impact of noninterest-bearing sources			**0.36**			0.26			0.22
Net interest income/yield on earning assets [7]		**$ 48,042**	**2.42%**		$ 45,592	2.37%		$ 41,996	2.25%

(1) Certain prior-period amounts have been reclassified to conform to current period presentation.
(2) Nonperforming loans are included in the respective average loan balances. Income on these nonperforming loans is generally recognized on a cost recovery basis.
(3) Includes assets of the Corporation's non-U.S. consumer credit card business, which was sold during the second quarter of 2017.
(4) Includes non-U.S. consumer loans of $2.8 billion, $2.9 billion and $3.4 billion in 2018, 2017 and 2016, respectively.
(5) Includes U.S. commercial real estate loans of $56.4 billion, $55.0 billion and $54.2 billion, and non-U.S. commercial real estate loans of $4.0 billion, $3.5 billion and $3.4 billion in 2018, 2017 and 2016, respectively.
(6) Interest income includes the impact of interest rate risk management contracts, which decreased interest income on the underlying assets by $171 million, $44 million and $176 million in 2018, 2017 and 2016, respectively. Interest expense includes the impact of interest rate risk management contracts, which decreased interest expense on the underlying liabilities by $130 million, $1.4 billion and $2.1 billion in 2018, 2017 and 2016, respectively. For more information, see Interest Rate Risk Management for the Banking Book on page 89.
(7) Net interest income includes FTE adjustments of $610 million, $925 million and $900 million in 2018, 2017 and 2016, respectively.

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

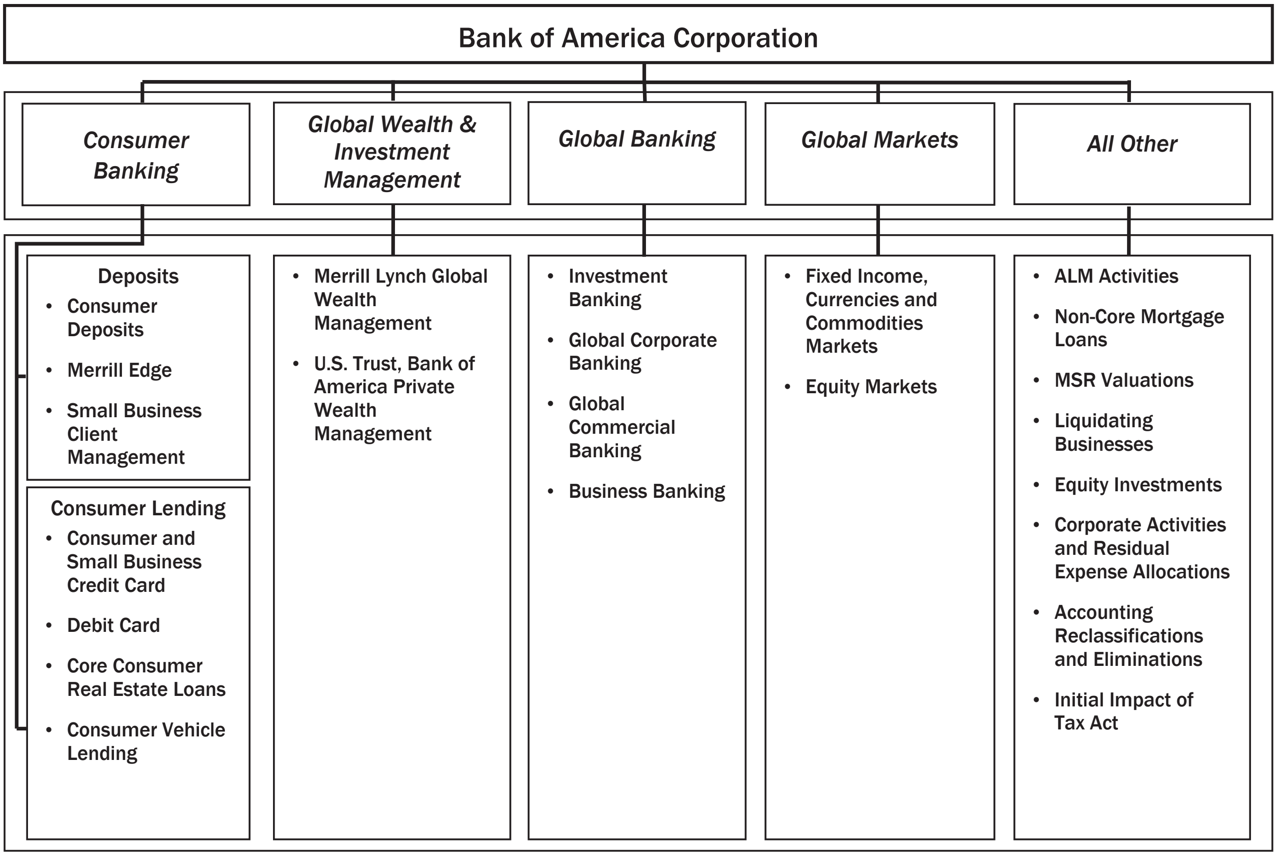
(Dollars in millions)	Due to Change in [1] Volume	Due to Change in [1] Rate	Net Change	Due to Change in [1] Volume	Due to Change in [1] Rate	Net Change
	From 2017 to 2018			From 2016 to 2017		
Increase (decrease) in interest income						
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	$ 109	$ 695	$ 804	$ (32)	$ 549	$ 517
Time deposits placed and other short-term investments	(53)	28	(25)	48	53	101
Federal funds sold and securities borrowed or purchased under agreements to resell	230	1,140	1,370	36	803	839
Trading account assets	134	149	283	(22)	77	55
Debt securities	44	1,167	1,211	438	925	1,363
Loans and leases:						
Residential mortgage	329	134	463	335	8	343
Home equity	(350)	315	(35)	(360)	255	(105)
U.S. credit card	339	449	788	290	331	621
Non-U.S. credit card [2]	(358)	—	(358)	(544)	(24)	(568)
Direct/Indirect and other consumer	(82)	452	370	48	315	363
Total consumer			1,228			654
U.S. commercial	402	1,770	2,172	468	1,196	1,664
Non-U.S. commercial	71	583	654	48	181	229
Commercial real estate	70	432	502	29	314	343
Commercial lease financing	(5)	(3)	(8)	19	60	79
Total commercial			3,320			2,315
Total loans and leases			4,548			2,969
Other earning assets	(18)	1,094	1,076	721	7	728
Total interest income			$ 9,267			$ 6,572
Increase (decrease) in interest expense						
U.S. interest-bearing deposits:						
Savings	$ —	$ 1	$ 1	$ —	$ —	$ —
NOW and money market deposit accounts	74	1,689	1,763	20	559	579
Consumer CDs and IRAs	(13)	49	36	(12)	—	(12)
Negotiable CDs, public funds and other deposits	132	505	637	20	174	194
Total U.S. interest-bearing deposits			2,437			761
Non-U.S. interest-bearing deposits:						
Banks located in non-U.S. countries	(1)	19	18	(12)	1	(11)
Governments and official institutions	(2)	(8)	(10)	(3)	4	1
Time, savings and other	26	93	119	24	141	165
Total non-U.S. interest-bearing deposits			127			155
Total interest-bearing deposits			2,564			916
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities	(71)	2,764	2,693	184	1,029	1,213
Trading account liabilities	140	14	154	206	(20)	186
Long-term debt	151	1,255	1,406	(85)	746	661
Total interest expense			6,817			2,976
Net increase in net interest income [3]			$ 2,450			$ 3,596

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

Business Segment Operations

Segment Description and Basis of Presentation

We report our results of operations through the following four business segments: *Consumer Banking, GWIM, Global Banking* and *Global Markets*, with the remaining operations recorded in *All Other*. We manage our segments and report their results on an FTE basis. For more information on our presentation of financial information on an FTE basis, see Supplemental Financial Data on page 39. The primary activities, products and businesses of the business segments and *All Other* are shown below.



We periodically review capital allocated to our businesses and allocate capital annually during the strategic and capital planning processes. We utilize a methodology that considers the effect of regulatory capital requirements in addition to internal risk-based capital models. Our internal risk-based capital models use a risk-adjusted methodology incorporating each segment's credit, market, interest rate, business and operational risk components. For more information on the nature of these risks, see Managing Risk on page 55. The capital allocated to the business segments is referred to as allocated capital. Allocated equity in the reporting units is comprised of allocated capital plus capital for the portion of goodwill and intangibles specifically assigned to the reporting unit. For more information, including the definition of reporting unit, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

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

Consumer Banking

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

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

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

Consumer Banking Results

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

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

The return on average allocated capital was 33 percent, up from 22 percent, driven by higher net income. For more information on capital allocated to the business segments, see Business Segment Operations on page 45.

Deposits

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

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

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

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

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

Key Statistics – Deposits

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

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

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

Consumer Lending

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

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

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

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

Key Statistics – Consumer Lending

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

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

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

Key Statistics – Loan Production (1)

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

(1) The loan production amounts represent the unpaid principal balance of loans and, in the case of home equity, the principal amount of the total line of credit.
(2) In addition to loan production in *Consumer Banking*, there is also first mortgage and home equity loan production in *GWIM.*

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

Home equity production in *Consumer Banking* and for the total Corporation decreased $1.9 billion and $2.1 billion in 2018 primarily driven by lower demand.

Global Wealth & Investment Management

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

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

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

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

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

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

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

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

The return on average allocated capital was 28 percent, up from 22 percent, as higher net income was partially offset by an increased capital allocation. For more information on capital allocated to the business segments, see Business Segment Operations on page 45.

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

Key Indicators and Metrics

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

(1) Includes margin receivables which are classified in customer and other receivables on the Consolidated Balance Sheet.
(2) Includes financial advisors in the *Consumer Banking* segment of 2,722 and 2,402 at December 31, 2018 and 2017.
(3) Financial advisor productivity is defined as MLGWM total revenue, excluding the allocation of certain asset and liability management (ALM) activities, divided by the total average number of financial advisors (excluding financial advisors in the *Consumer Banking* segment).

Client Balances

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

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

Global Banking

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

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

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

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

The return on average allocated capital was 20 percent, up from 17 percent, as higher net income was partially offset by an increased capital allocation. For more information on capital allocated to the business segments, see Business Segment Operations on page 45.

Global Corporate, Global Commercial and Business Banking

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

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

Global Corporate, Global Commercial and Business Banking

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

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

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

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

Global Investment Banking

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

Investment Banking Fees

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

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

Global Markets

(Dollars in millions)		2018		2017	% Change
Net interest income	$	**3,171**	$	3,744	(15)%
Noninterest income:					
Investment and brokerage services		**1,780**		2,049	(13)
Investment banking fees		**2,296**		2,476	(7)
Trading account profits		**7,932**		6,710	18
All other income		**884**		972	(9)
Total noninterest income		**12,892**		12,207	6
Total revenue, net of interest expense		**16,063**		15,951	1
Provision for credit losses		**—**		164	(100)
Noninterest expense		**10,686**		10,731	—
Income before income taxes		**5,377**		5,056	6
Income tax expense		**1,398**		1,763	(21)
Net income	$	**3,979**	$	3,293	21
Effective tax rate		**26.0%**		34.9%	
Return on average allocated capital		**11**		9	
Efficiency ratio		**66.53**		67.27	
Balance Sheet					
Average					
Trading-related assets:					
Trading account securities	$	**215,112**	$	216,996	(1)%
Reverse repurchases		**125,084**		101,795	23
Securities borrowed		**78,889**		82,210	(4)
Derivative assets		**46,047**		40,811	13
Total trading-related assets		**465,132**		441,812	5
Total loans and leases		**72,651**		71,413	2
Total earning assets		**473,383**		449,441	5
Total assets		**666,003**		638,673	4
Total deposits		**31,209**		32,864	(5)
Allocated capital		**35,000**		35,000	—
Year end					
Total trading-related assets	$	**447,998**	$	419,375	7 %
Total loans and leases		**73,928**		76,778	(4)
Total earning assets		**457,224**		449,314	2
Total assets		**641,922**		629,013	2
Total deposits		**37,841**		34,029	11

Global Markets offers sales and trading services and research services to institutional clients across fixed-income, credit, currency, commodity and equity businesses. *Global Markets* product coverage includes securities and derivative products in both the primary and secondary markets. *Global Markets* provides market-making, financing, securities clearing, settlement and custody services globally to our institutional investor clients in support of their investing and trading activities. We also work with our commercial and corporate clients to provide risk management products using interest rate, equity, credit, currency and commodity derivatives, foreign exchange, fixed-income and mortgage-related products. As a result of our market-making activities in these products, we may be required to manage risk in a broad range of financial products including government securities, equity and equity-linked securities, high-grade and high-yield corporate debt securities, syndicated loans, MBS, commodities and asset-backed securities. The economics of certain investment banking and underwriting activities are shared primarily between *Global Markets* and *Global Banking* under an internal revenue-sharing arrangement. *Global Banking* originates certain deal-related transactions with our corporate and commercial clients that are executed and distributed by *Global Markets*. For information on investment banking fees on a consolidated basis, see page 51.

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

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

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

The return on average allocated capital was 11 percent, up from 9 percent, reflecting higher net income. For more information on capital allocated to the business segments, see Business Segment Operations on page 45.

Sales and Trading Revenue

Sales and trading revenue includes unrealized and realized gains and losses on trading and other assets, net interest income, and fees primarily from commissions on equity securities. Sales and trading revenue is segregated into fixed-income (government debt obligations, investment and non-investment grade corporate debt obligations, commercial MBS, residential mortgage-backed securities, collateralized loan obligations, interest rate and credit derivative contracts), currencies (interest rate and foreign exchange contracts), commodities (primarily futures, forwards, swaps and options) and equities (equity-linked derivatives and cash equity activity). The following table and related discussion present sales and trading revenue, substantially all of which is in *Global Markets,* with the remainder in *Global Banking*. In addition, the following table and related discussion present sales and trading revenue, excluding net DVA, which is a non-GAAP financial measure. For more information on net DVA, see Supplemental Financial Data on page 39.

Sales and Trading Revenue (1, 2)

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

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

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

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

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

All Other

(Dollars in millions)	2018	2017	% Change
Net interest income	**$ 573**	$ 864	(34)%
Noninterest income (loss)	**(1,284)**	(1,648)	(22)
Total revenue, net of interest expense	**(711)**	(784)	(9)
Provision for credit losses	**(476)**	(561)	(15)
Noninterest expense	**2,614**	4,065	(36)
Loss before income taxes	**(2,849)**	(4,288)	(34)
Income tax benefit	**(2,736)**	(979)	n/m
Net loss	**$ (113)**	$ (3,309)	(97)
Balance Sheet			
Average			
Total loans and leases	**$ 61,013**	$ 82,489	(26)%
Total assets (1)	**201,298**	206,999	(3)
Total deposits	**21,966**	25,194	(13)
Year end			
Total loans and leases	**$ 48,061**	$ 69,452	(31)%
Total assets (1)	**196,325**	194,042	1
Total deposits	**18,541**	22,719	(18)

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

n/m = not meaningful

All Other consists of ALM activities, equity investments, non-core mortgage loans and servicing activities, the net impact of periodic revisions to the MSR valuation model for core and non-core MSRs and the related economic hedge results, liquidating businesses and residual expense allocations. ALM activities encompass certain residential mortgages, debt securities, interest rate and foreign currency risk management activities, the impact of certain allocation methodologies and hedge ineffectiveness. The results of certain ALM activities are allocated to our business segments. For more information on our ALM activities, see *Note 23 – Business Segment Information* to the Consolidated Financial Statements. Equity investments include our merchant services joint venture as well as a portfolio of equity, real estate and other alternative investments. For more information on our merchant services joint venture, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

The Corporation classifies consumer real estate loans as core or non-core based on loan and customer characteristics. For more information on the core and non-core portfolios, see Consumer Portfolio Credit Risk Management on page 66. Residential mortgage loans that are held for ALM purposes, including interest rate or liquidity risk management, are classified as core and are presented on the balance sheet of *All Other*. During 2018, residential mortgage loans held for ALM activities decreased $3.6 billion to $24.9 billion at December 31, 2018 primarily as a result of payoffs and paydowns. Non-core residential mortgage and home equity loans, which are principally runoff portfolios, are also held in *All Other*. During 2018, total non-core loans decreased $17.8 billion to $23.5 billion at December 31, 2018 due primarily to loan sales of $10.8 billion, as well as payoffs and paydowns.

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

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

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

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

Off-Balance Sheet Arrangements and Contractual Obligations

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

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

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

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

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

Table 12 Contractual Obligations

	December 31, 2018					December 31 2017
(Dollars in millions)	Due in One Year or Less	Due After One Year Through Three Years	Due After Three Years Through Five Years	Due After Five Years	Total	Total
Long-term debt	$ 37,975	$ 43,685	$ 41,603	$ 106,077	**$ 229,340**	$ 227,402
Operating lease obligations	2,370	4,197	3,043	6,160	**15,770**	14,520
Purchase obligations	1,288	1,162	507	1,091	**4,048**	4,219
Time deposits	53,482	5,477	1,473	607	**61,039**	67,844
Other long-term liabilities	1,611	1,049	729	544	**3,933**	4,972
Estimated interest expense on long-term debt and time deposits (1)	6,795	10,778	8,407	30,872	**56,852**	49,123
Total contractual obligations	$ 103,521	$ 66,348	$ 55,762	$ 145,351	**$ 370,982**	$ 368,080

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

Representations and Warranties Obligations

For more information on representations and warranties obligations in connection with the sale of mortgage loans, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements. For more information related to the sensitivity of the assumptions used to estimate our reserve for representations and warranties, see Complex Accounting Estimates – Representations and Warranties Liability on page 94.

Managing Risk

Overview

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

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

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

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

As set forth in our Risk Framework, a culture of managing risk well is fundamental to fulfilling our purpose and our values and delivering responsible growth. It requires us to focus on risk in all activities and encourages the necessary mindset and behavior to enable effective risk management, and promotes sound risk-taking within our risk appetite. Sustaining a culture of managing risk well throughout the organization is critical to our success and is a clear expectation of our executive management team and the Board.

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

Executive management assesses, with Board oversight, the risk-adjusted returns of each business. Management reviews and approves the strategic and financial operating plans, as well as the capital plan and Risk Appetite Statement, and recommends them annually to the Board for approval. Our strategic plan takes into consideration return objectives and financial resources, which must align with risk capacity and risk appetite. Management sets financial objectives for each business by allocating capital and setting a target for return on capital for each business. Capital allocations and operating limits are regularly evaluated as part of our overall governance processes as the businesses and the economic environment in which we operate continue to evolve. For more information regarding capital allocations, see Business Segment Operations on page 45.

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

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

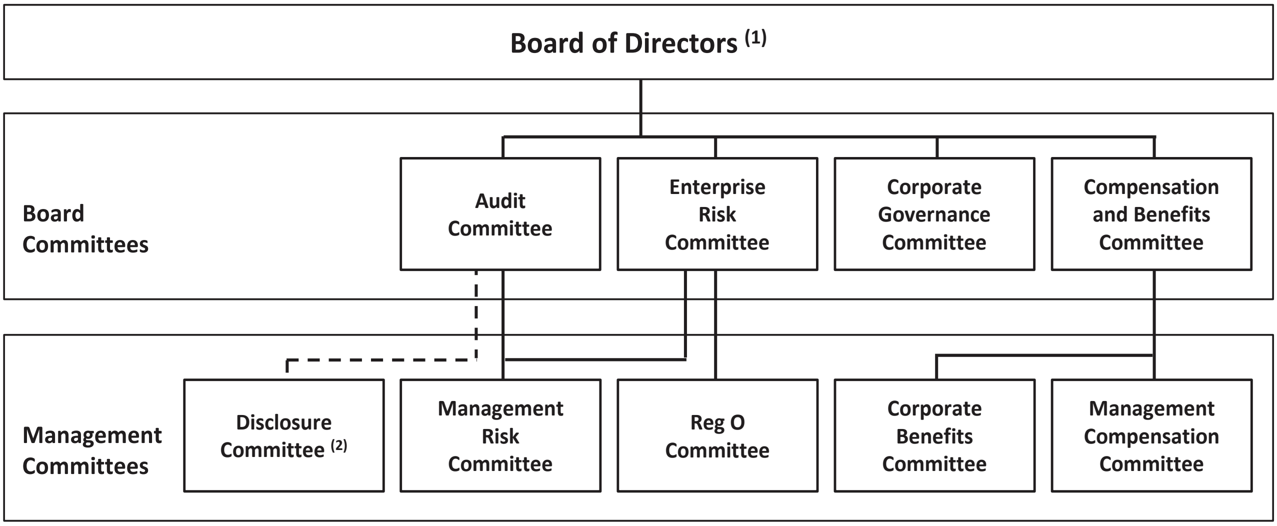
Our lines of business operate with risk limits (which may include credit, market and/or operational limits, as applicable) that align with the Corporation's risk appetite. Executive management is responsible for tracking and reporting performance measurements as well as any exceptions to guidelines or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

For a more detailed discussion of our risk management activities, see the discussion below and pages 58 through 92.

Risk Management Governance

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

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



(1) This presentation does not include committees for other legal entities.
(2) Reports to the CEO and CFO with oversight by the Audit Committee.

Board of Directors and Board Committees

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

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

Audit Committee

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

Enterprise Risk Committee

The ERC has primary responsibility for oversight of the Risk Framework and key risks we face and of the Corporation's overall risk appetite. It approves the Risk Framework and the Risk Appetite Statement and further recommends these documents to the Board for approval. The ERC oversees senior management's responsibilities for the identification, measurement, monitoring and control of key risks we face. The ERC may consult with other Board committees on risk-related matters.

Other Board Committees

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

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

Management Committees

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

Lines of Defense

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

Executive Officers

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

Front Line Units

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

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

Independent Risk Management

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

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

Corporate Audit

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

Risk Management Processes

The Risk Framework requires that strong risk management practices are integrated in key strategic, capital and financial planning processes and in day-to-day business processes across the Corporation, with a goal of ensuring risks are appropriately considered, evaluated and responded to in a timely manner.

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

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

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

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

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

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

Corporation-wide Stress Testing

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

Contingency Planning

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

Strategic Risk Management

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

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

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

Capital Management

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

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

We periodically review capital allocated to our businesses and allocate capital annually during the strategic and capital planning processes. For additional information, see Business Segment Operations on page 45.

CCAR and Capital Planning

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

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

During 2018, pursuant to the Board's authorizations, including those related to our 2017 CCAR capital plan that expired June 30, 2018, we repurchased \$20.1 billion of common stock, which includes common stock repurchases to offset equity-based compensation awards. At December 31, 2018, our remaining stock repurchase authorization was $10.3 billion.

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

Regulatory Capital

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

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

Minimum Capital Requirements

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

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

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

Capital Composition and Ratios

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

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

(Dollars in millions, except as noted)	Standardized Approach	Advanced Approaches	Current Regulatory Minimum [(2)]	2019 Regulatory Minimum [(3)]
	December 31, 2018			
Risk-based capital metrics:				
Common equity tier 1 capital	**$ 167,272**	**$ 167,272**		
Tier 1 capital	**189,038**	**189,038**		
Total capital [(4)]	**221,304**	**212,878**		
Risk-weighted assets (in billions)	**1,437**	**1,409**		
Common equity tier 1 capital ratio	**11.6%**	**11.9%**	**8.25%**	**9.5%**
Tier 1 capital ratio	**13.2**	**13.4**	**9.75**	**11.0**
Total capital ratio	**15.4**	**15.1**	**11.75**	**13.0**
Leverage-based metrics:				
Adjusted quarterly average assets (in billions) [(5)]	**$ 2,258**	**$ 2,258**		
Tier 1 leverage ratio	**8.4%**	**8.4%**	**4.0**	**4.0**
SLR leverage exposure (in billions)		**$ 2,791**		
SLR		**6.8%**	**5.0**	**5.0**
	December 31, 2017			
Risk-based capital metrics:				
Common equity tier 1 capital	$ 168,461	$ 168,461		
Tier 1 capital	190,189	190,189		
Total capital [(4)]	224,209	215,311		
Risk-weighted assets (in billions)	1,443	1,459		
Common equity tier 1 capital ratio	11.7%	11.5%	7.25%	9.5%
Tier 1 capital ratio	13.2	13.0	8.75	11.0
Total capital ratio	15.5	14.8	10.75	13.0
Leverage-based metrics:				
Adjusted quarterly average assets (in billions) [(5)]	$ 2,223	$ 2,223		
Tier 1 leverage ratio	8.6%	8.6%	4.0	4.0

(1) Basel 3 transition provisions for regulatory capital adjustments and deductions were fully phased in as of January 1, 2018. Prior periods are presented on a fully phased-in basis.
(2) The December 31, 2018 and 2017 amounts include a transition capital conservation buffer of 1.875 percent and 1.25 percent and a transition G-SIB surcharge of 1.875 percent and 1.5 percent. The countercyclical capital buffer for both periods is zero.
(3) The 2019 regulatory minimums include a capital conservation buffer of 2.5 percent and G-SIB surcharge of 2.5 percent. The countercyclical capital buffer is zero. We became subject to these regulatory minimums on January 1, 2019. The SLR minimum includes a leverage buffer of 2.0 percent and was applicable beginning on January 1, 2018.
(4) Total capital under the Advanced approaches differs from the Standardized approach due to differences in the amount permitted in Tier 2 capital related to the qualifying allowance for credit losses.
(5) Reflects adjusted average total assets for the three months ended December 31, 2018 and 2017.

CET1 capital was $167.3 billion at December 31, 2018, a decrease of $1.2 billion from December 31, 2017, driven by common stock repurchases, dividends and market value declines on AFS debt securities included in accumulated OCI, partially offset by earnings. During 2018, Total capital under the Advanced approaches decreased $2.4 billion driven by the same factors as CET1 capital and a decrease in subordinated debt included in Tier 2 capital. Standardized risk-weighted assets, which yielded the lower CET1 capital ratio for December 31, 2018, decreased $5.5 billion during 2018 to $1,437 billion primarily due to sales of non-core mortgage loans and a decrease in market risk, partially offset by an increase in commercial loans.

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

Table 14 Capital Composition under Basel 3 [(1)]

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

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

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

Table 15 Risk-weighted Assets under Basel 3 (1)

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

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

Bank of America, N.A. Regulatory Capital

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

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

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

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

Regulatory Developments

Minimum Total Loss-Absorbing Capacity

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

Stress Buffer Requirements

On April 10, 2018, the Federal Reserve announced a proposal to integrate the annual quantitative assessment of the CCAR program with the buffer requirements in the Basel 3 capital rule by introducing stress buffer requirements as a replacement of the CCAR quantitative objection. Under the Standardized approach, the proposal replaces the existing static 2.5 percent capital conservation buffer with a stress capital buffer, calculated as the decrease in the CET1 capital ratio in the supervisory severely adverse scenario of the modified CCAR stress test plus four quarters of planned common stock dividend payments, floored at 2.5 percent. The static 2.5 percent capital conservation buffer would be retained under the Advanced approaches. The proposal also introduces a stress leverage buffer requirement which would be calculated as the decrease in the Tier 1 leverage ratio in the supervisory severely adverse scenario of the modified CCAR stress test plus four quarters of planned common stock dividends, with no floor. The SLR would not incorporate a stress buffer requirement. The proposal also updates the capital distribution assumptions used in the CCAR stress test to better align with a firm's expected actions in stress, notably removing the assumption that a BHC will carry out all of its planned capital actions under stress.

Enhanced Supplementary Leverage Ratio and TLAC Requirements

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

Revisions to Basel 3 to Address Current Expected Credit Loss Accounting

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

Single-Counterparty Credit Limits

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

Broker-dealer Regulatory Capital and Securities Regulation

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

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

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

As a result of resolution planning, the current business of MLPF&S is expected to be reorganized into two affiliated broker-dealers: MLPF&S and BofA Securities, Inc., a newly formed broker-dealer. Under the contemplated reorganization, which is expected to occur during 2019, BofA Securities, Inc. would become the legal entity for the institutional services that are now provided by MLPF&S. MLPF&S' retail services would remain with MLPF&S. The contemplated reorganization is subject to regulatory approval. For more information on resolution planning, see Item 1. Business – Resolution Planning of our 2018 Annual Report on Form 10-K.

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

Liquidity Risk

Funding and Liquidity Risk Management

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

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

The Board approves our liquidity risk policy and the Financial Contingency and Recovery Plan. The ERC establishes our liquidity risk tolerance levels. The MRC is responsible for overseeing liquidity risks and directing management to maintain exposures within the established tolerance levels. The MRC reviews and monitors our liquidity position and stress testing results, approves certain liquidity risk limits and reviews the impact of strategic decisions on our liquidity. For more information, see Managing Risk on page 55. Under this governance framework, we have developed certain funding and liquidity risk management practices which include: maintaining liquidity at the parent company and selected subsidiaries, including our bank subsidiaries and other regulated entities; determining what amounts of liquidity are appropriate for these entities based on analysis of debt maturities and other potential cash outflows, including those that we may experience during stressed market conditions; diversifying funding sources, considering our asset profile and legal entity structure; and performing contingency planning.

NB Holdings Corporation

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

(NB Holdings). The parent company is expected to continue to have access to the same flow of dividends, interest and other amounts of cash necessary to service its debt, pay dividends and perform other obligations as it would have had if it had not entered into these arrangements and transferred any assets.

In consideration for the transfer of assets, NB Holdings issued a subordinated note to the parent company in a principal amount equal to the value of the transferred assets. The aggregate principal amount of the note will increase by the amount of any future asset transfers. NB Holdings also provided the parent company with a committed line of credit that allows the parent company to draw funds necessary to service near-term cash needs. These arrangements support our preferred single point of entry resolution strategy, under which only the parent company would be resolved under the U.S. Bankruptcy Code. These arrangements include provisions to terminate the line of credit, forgive the subordinated note and require the parent company to transfer its remaining financial assets to NB Holdings if our projected liquidity resources deteriorate so severely that resolution of the parent company becomes imminent.

Global Liquidity Sources and Other Unencumbered Assets

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

Table 17 presents average GLS for the three months ended December 31, 2018 and 2017.

Table 17 Average Global Liquidity Sources

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

Typically, parent company and NB Holdings liquidity is in the form of cash deposited with BANA.

Our bank subsidiaries' liquidity is primarily driven by deposit and lending activity, as well as securities valuation and net debt activity. Liquidity at bank subsidiaries excludes the cash deposited by the parent company and NB Holdings. Our bank subsidiaries can also generate incremental liquidity by pledging a range of unencumbered loans and securities to certain FHLBs and the Federal Reserve Discount Window. The cash we could have obtained by borrowing against this pool of specifically-identified eligible assets was $344 billion and $308 billion at December 31, 2018 and 2017. We have established operational procedures to enable us to borrow against these assets, including regularly monitoring our total pool of eligible loans and securities collateral. Eligibility is defined in guidelines from the FHLBs and the Federal Reserve and is subject to change at their discretion. Due to regulatory restrictions, liquidity generated by the bank subsidiaries can generally be used only to fund obligations within the bank subsidiaries, and transfers to the parent company or nonbank subsidiaries may be subject to prior regulatory approval.

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

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

Table 18 Average Global Liquidity Sources Composition

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

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

Liquidity Stress Analysis

We utilize liquidity stress analysis to assist us in determining the appropriate amounts of liquidity to maintain at the parent company and our subsidiaries to meet contractual and contingent cash outflows under a range of scenarios. The scenarios we consider and utilize incorporate market-wide and Corporation-specific events, including potential credit rating downgrades for the parent company and our subsidiaries, and more severe events including potential resolution scenarios. The scenarios are based on our historical experience, experience of distressed and failed financial institutions, regulatory guidance, and both expected and unexpected future events.

The types of potential contractual and contingent cash outflows we consider in our scenarios may include, but are not limited to, upcoming contractual maturities of unsecured debt and reductions in new debt issuance; diminished access to secured financing markets; potential deposit withdrawals; increased draws on loan commitments, liquidity facilities and letters of credit; additional collateral that counterparties could call if our credit ratings were downgraded; collateral and margin requirements arising from market value changes; and potential liquidity required to maintain businesses and finance customer activities. Changes in certain market factors, including, but not limited to, credit rating downgrades, could negatively impact potential contractual and contingent outflows and the related financial instruments, and in some cases these impacts could be material to our financial results.

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

Net Stable Funding Ratio

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

Diversified Funding Sources

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

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

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

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

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

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

Table 19 Long-term Debt by Major Currency

	December 31	
(Dollars in millions)	**2018**	2017
U.S. dollar	**$ 180,709**	$ 175,623
Euro	**34,296**	35,481
British pound	**5,450**	7,016
Japanese yen	**3,036**	2,993
Canadian dollar	**2,935**	1,966
Australian dollar	**1,722**	3,046
Other	**1,192**	1,277
Total long-term debt	**$ 229,340**	$ 227,402

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

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

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

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

We use derivative transactions to manage the duration, interest rate and currency risks of our borrowings, considering the characteristics of the assets they are funding. For more information on our ALM activities, see Interest Rate Risk Management for the Banking Book on page 89.

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

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

Contingency Planning

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

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

Credit Ratings

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

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

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

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

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

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

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

Table 20 Senior Debt Ratings

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

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

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

While certain potential impacts are contractual and quantifiable, the full scope of the consequences of a credit rating downgrade to a financial institution is inherently uncertain, as it depends upon numerous dynamic, complex and inter-related factors and assumptions, including whether any downgrade of a company's long-term credit ratings precipitates downgrades to its short-term credit ratings, and assumptions about the potential behaviors of various customers, investors and counterparties. For more information on potential impacts of credit rating downgrades, see Liquidity Risk – Liquidity Stress Analysis on page 63.

For more information on additional collateral and termination payments that could be required in connection with certain OTC derivative contracts and other trading agreements as a result of such a credit rating downgrade, see *Note 3 – Derivatives* to the Consolidated Financial Statements and Item 1A. Risk Factors of our 2018 Annual Report on Form 10-K.

Common Stock Dividends

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

Credit Risk Management

Credit risk is the risk of loss arising from the inability or failure of a borrower or counterparty to meet its obligations. Credit risk can also arise from operational failures that result in an erroneous advance, commitment or investment of funds. We define the credit exposure to a borrower or counterparty as the loss potential arising from all product classifications including loans and leases, deposit overdrafts, derivatives, assets held-for-sale and unfunded lending commitments which include loan commitments, letters of credit and financial guarantees. Derivative positions are recorded at fair value and assets held-for-sale are recorded at either fair value or the lower of cost or fair value. Certain loans and unfunded commitments are accounted for under the fair value option. Credit risk for categories of assets carried at fair value is not accounted for as part of the allowance for credit losses but as part of the fair value adjustments recorded in earnings. For derivative positions, our credit risk is measured as the net cost in the event the counterparties with contracts in which we are in a gain position fail to perform under the terms of those contracts. We use the current fair value to represent credit exposure without giving consideration to future mark-to-market changes. The credit risk amounts take into consideration the effects of legally enforceable master netting agreements and cash collateral. Our consumer and commercial credit extension and review procedures encompass funded and unfunded credit exposures. For more information on derivatives and credit extension commitments, see *Note 3 – Derivatives* and *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

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

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

For more information on our credit risk management activities, see Consumer Portfolio Credit Risk Management below, Commercial Portfolio Credit Risk Management on page 74, Non-U.S. Portfolio on page 80, Provision for Credit Losses on page 82, Allowance for Credit Losses on page 82, and *Note 5 – Outstanding Loans and Leases* and *Note 6 – Allowance for Credit Losses* to the Consolidated Financial Statements.

Consumer Portfolio Credit Risk Management

Credit risk management for the consumer portfolio begins with initial underwriting and continues throughout a borrower's credit cycle. Statistical techniques in conjunction with experiential judgment are used in all aspects of portfolio management including underwriting, product pricing, risk appetite, setting credit limits, and establishing operating processes and metrics to quantify and balance risks and returns. Statistical models are built using detailed behavioral information from external sources such as credit bureaus and/or internal historical experience and are a component of our consumer credit risk management process.

These models are used in part to assist in making both new and ongoing credit decisions, as well as portfolio management strategies, including authorizations and line management, collection practices and strategies, and determination of the allowance for loan and lease losses and allocated capital for credit risk.

Consumer Credit Portfolio

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

Improved credit quality, continued loan balance runoff and sales primarily in the non-core consumer real estate portfolio, partially offset by seasoning within the U.S. credit card portfolio, drove a $581 million decrease in the consumer allowance for loan and lease losses in 2018 to $4.8 billion at December 31, 2018. For additional information, see Allowance for Credit Losses on page 82.

For more information on our accounting policies regarding delinquencies, nonperforming status, charge-offs, troubled debt restructurings (TDRs) for the consumer portfolio and PCI loans, see *Note 1 – Summary of Significant Accounting Principles* and *Note 5 – Outstanding Loans and Leases* to the Consolidated Financial Statements.

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

Table 21 Consumer Credit Quality

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

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

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

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

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

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

n/a = not applicable

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

Table 22 Consumer Net Charge-offs and Related Ratios

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

(1) Net charge-offs exclude write-offs in the PCI loan portfolio. For more information, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 72.

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

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

n/m = not meaningful

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

Table 23 presents outstandings, nonperforming balances, net charge-offs, allowance for loan and lease losses and provision for loan and lease losses for the core and non-core portfolios within the consumer real estate portfolio. We categorize consumer real estate loans as core and non-core based on loan and customer characteristics such as origination date, product type, loan-to-value (LTV), Fair Isaac Corporation (FICO) score and delinquency status consistent with our current consumer and mortgage servicing strategy. Generally, loans that were originated after January 1, 2010, qualified under GSE underwriting guidelines, or otherwise met our underwriting guidelines in place in 2015 are characterized as core loans. All other loans are generally characterized as non-core loans and represent runoff portfolios. Core loans as reported in Table 23 include loans held in the *Consumer Banking* and *GWIM* segments, as well as loans held for ALM activities in *All Other*.

As shown in Table 23, outstanding core consumer real estate loans increased $12.8 billion during 2018 driven by an increase of $17.1 billion in residential mortgage, partially offset by a $4.2 billion decrease in home equity.

During 2018, we sold $11.6 billion of consumer real estate loans compared to $4.0 billion in 2017. In addition to recurring loan sales, the 2018 amount includes sales of loans, primarily non-core, with a carrying value of $9.6 billion and related gains of $731 million recorded in other income in the Consolidated Statement of Income.

Table 23 Consumer Real Estate Portfolio (1)

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

	Allowance for Loan and Lease Losses		Provision for Loan and Lease Losses	
	December 31			
	2018	2017	**2018**	2017
Core portfolio				
Residential mortgage	**$ 214**	$ 218	**$ 7**	$ (79)
Home equity	**228**	367	**(60)**	(91)
Total core portfolio	**442**	585	**(53)**	(170)
Non-core portfolio				
Residential mortgage	**208**	483	**(104)**	(201)
Home equity	**278**	652	**(335)**	(339)
Total non-core portfolio	**486**	1,135	**(439)**	(540)
Consumer real estate portfolio				
Residential mortgage	**422**	701	**(97)**	(280)
Home equity	**506**	1,019	**(395)**	(430)
Total consumer real estate portfolio	**$ 928**	$ 1,720	**$ (492)**	$ (710)

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

(2) Net charge-offs exclude write-offs in the PCI loan portfolio. For more information, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 72.

We believe that the presentation of information adjusted to exclude the impact of the PCI loan portfolio, the fully-insured loan portfolio and loans accounted for under the fair value option is more representative of the ongoing operations and credit quality of the business. As a result, in the following tables and discussions of the residential mortgage and home equity portfolios, we exclude loans accounted for under the fair value option and provide information that excludes the impact of the PCI loan portfolio and the fully-insured loan portfolio in certain credit quality statistics. We separately disclose information on the PCI loan portfolio on page 72.

Residential Mortgage

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

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

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

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

Table 24 Residential Mortgage – Key Credit Statistics

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

	2018	2017	**2018**	2017
Net charge-off ratio (3)	**0.01%**	(0.05)%	**0.02%**	(0.06)%

(1) Outstandings, accruing past due, nonperforming loans and percentages of portfolio exclude loans accounted for under the fair value option.
(2) These vintages of loans accounted for $536 million, or 28 percent, and $825 million, or 33 percent, of nonperforming residential mortgage loans at December 31, 2018 and 2017.
(3) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans excluding loans accounted for under the fair value option.

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

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

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

Of the $184.6 billion in total residential mortgage loans outstanding at December 31, 2018, as shown in Table 24, 30 percent were originated as interest-only loans. The outstanding balance of interest-only residential mortgage loans that have entered the amortization period was $8.6 billion, or 16 percent, at December 31, 2018. Residential mortgage loans that have entered the amortization period generally have experienced a higher rate of early stage delinquencies and nonperforming status compared to the residential mortgage portfolio as a whole. At December 31, 2018, $177 million, or two percent, of outstanding interest-only residential mortgages that had entered the amortization period were accruing past due 30 days or more compared to $1.2 billion, or one percent, for the entire residential mortgage portfolio. In addition, at December 31, 2018, $365 million, or four percent, of outstanding interest-only residential mortgage loans that had entered the amortization period were nonperforming, of which $128 million were contractually current, compared to $1.9 billion, or one percent, for the entire residential mortgage portfolio. Loans that have yet to enter the amortization period in our interest-only residential mortgage portfolio are primarily well-collateralized loans to our wealth management clients and have an interest-only period of three to ten years. Approximately 90 percent of these loans that have yet to enter the amortization period will not be required to make a fully-amortizing payment until 2022 or later.

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

Table 25 Residential Mortgage State Concentrations

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

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option.
(2) Net charge-offs exclude $154 million and $131 million of write-offs in the residential mortgage PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 72.
(3) In these states, foreclosure requires a court order following a legal proceeding (judicial states).
(4) Amounts exclude the PCI residential mortgage and fully-insured loan portfolios.
(5) At December 31, 2018 and 2017, 49 percent and 47 percent of PCI residential mortgage loans were in California. There were no other significant single state concentrations.

Home Equity

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

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

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

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

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

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

Table 26 Home Equity – Key Credit Statistics

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

(1) Outstandings, accruing past due, nonperforming loans and percentages of the portfolio exclude loans accounted for under the fair value option.
(2) Accruing past due 30 days or more include $48 million and $67 million and nonperforming loans include $218 million and $344 million of loans where we serviced the underlying first lien at December 31, 2018 and 2017.
(3) These vintages of loans have higher refreshed combined loan-to-value (CLTV) ratios and accounted for 49 percent and 52 percent of nonperforming home equity loans at December 31, 2018 and 2017, and $11 million and $193 million of net charge-offs in 2018 and 2017.
(4) Net charge-off ratios are calculated as net charge-offs divided by average outstanding loans excluding loans accounted for under the fair value option.

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

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

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

Outstanding balances with a refreshed CLTV greater than 100 percent comprised three percent and four percent of the home equity portfolio at December 31, 2018 and 2017. Outstanding balances with a refreshed CLTV greater than 100 percent reflect loans where our loan and available line of credit combined with any outstanding senior liens against the property are equal to or greater than the most recent valuation of the property securing the loan. Depending on the value of the property, there may be collateral in excess of the first lien that is available to reduce the severity of loss on the second lien. Of those outstanding balances with a refreshed CLTV greater than 100 percent, 96 percent of the customers were current on their home equity loan and 91 percent of second-lien loans with a refreshed CLTV greater than 100 percent were current on both their second-lien and underlying first-lien loans at December 31, 2018.

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

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

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

Table 27 Home Equity State Concentrations

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

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option.
(2) Net charge-offs exclude $119 million and $76 million of write-offs in the home equity PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio.
(3) In these states, foreclosure requires a court order following a legal proceeding (judicial states).
(4) Amount excludes the PCI home equity portfolio.
(5) At December 31, 2018 and 2017, 34 percent and 28 percent of PCI home equity loans were in California. There were no other significant single state concentrations.

Purchased Credit-impaired Loan Portfolio

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

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

Table 28 Purchased Credit-impaired Loan Portfolio

(Dollars in millions)	Unpaid Principal Balance	Gross Carrying Value	Related Valuation Allowance	Carrying Value Net of Valuation Allowance	Percent of Unpaid Principal Balance
	December 31, 2018				
Residential mortgage (1)	**$ 3,872**	**$ 3,800**	**$ 30**	**$ 3,770**	**97.37%**
Home equity	**896**	**845**	**61**	**784**	**87.50**
Total purchased credit-impaired loan portfolio	**$ 4,768**	**$ 4,645**	**$ 91**	**$ 4,554**	**95.51**
	December 31, 2017				
Residential mortgage (1)	$ 8,117	$ 8,001	$ 117	$ 7,884	97.13%
Home equity	2,787	2,716	172	2,544	91.28
Total purchased credit-impaired loan portfolio	$ 10,904	$ 10,717	$ 289	$ 10,428	95.63

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

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

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

The PCI residential mortgage loan and home equity portfolios represented 82 percent and 18 percent of the total PCI loan portfolio at December 31, 2018. Those loans to borrowers with a refreshed FICO score below 620 represented 19 percent and 21 percent of the PCI residential mortgage loan and home equity portfolios at December 31, 2018. Residential mortgage and home equity loans with a refreshed LTV or CLTV greater than 90 percent, after consideration of purchase accounting adjustments and the related valuation allowance, represented 10 percent and 28 percent of their respective PCI loan portfolios and 11 percent and 32 percent based on the unpaid principal balance at December 31, 2018.

U.S. Credit Card

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

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

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

Table 29 U.S. Credit Card State Concentrations

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

Direct/Indirect Consumer

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

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

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

Table 30 Direct/Indirect State Concentrations

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

Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

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

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

Foreclosed properties increased $8 million in 2018 to $244 million as additions outpaced liquidations. PCI loans are excluded from nonperforming loans as these loans were written down to fair value at the acquisition date; however, once we acquire the underlying real estate upon foreclosure of the delinquent PCI loan, it is included in foreclosed properties. Certain delinquent government-guaranteed loans (principally FHA-insured loans) are excluded from our nonperforming loans and foreclosed properties activity as we expect we will be reimbursed once the property is conveyed to the guarantor for principal and, up to certain limits, costs incurred during the foreclosure process and interest accrued during the holding period.

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

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

Table 31 Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

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

(1) Consumer loans may be returned to performing status when all principal and interest is current and full repayment of the remaining contractual principal and interest is expected, or when the loan otherwise becomes well-secured and is in the process of collection.
(2) Foreclosed property balances do not include properties insured by certain government-guaranteed loans, principally FHA-insured, of $488 million and $801 million at December 31, 2018 and 2017.
(3) Outstanding consumer loans and leases exclude loans accounted for under the fair value option.

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

Table 32 Consumer Real Estate Troubled Debt Restructurings

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

(1) At December 31, 2018 and 2017, residential mortgage TDRs deemed collateral dependent totaled $1.6 billion and $2.8 billion, and included $960 million and $1.2 billion of loans classified as nonperforming and $605 million and $1.6 billion of loans classified as performing.
(2) Residential mortgage performing TDRs included $2.8 billion and $3.7 billion of loans that were fully-insured at December 31, 2018 and 2017.
(3) At December 31, 2018 and 2017, home equity TDRs deemed collateral dependent totaled $1.3 billion and $1.6 billion, and included $961 million and $1.2 billion of loans classified as nonperforming and $322 million and $388 million of loans classified as performing.

In addition to modifying consumer real estate loans, we work with customers who are experiencing financial difficulty by modifying credit card and other consumer loans. Credit card and other consumer loan modifications generally involve a reduction in the customer's interest rate on the account and placing the customer on a fixed payment plan not exceeding 60 months, all of which are considered TDRs (the renegotiated TDR portfolio).

Modifications of credit card and other consumer loans are made through renegotiation programs utilizing direct customer contact, but may also utilize external renegotiation programs. The renegotiated TDR portfolio is excluded in large part from Table 31 as substantially all of the loans remain on accrual status until either charged off or paid in full. At December 31, 2018 and 2017, our renegotiated TDR portfolio was $566 million and $490 million, of which $481 million and $426 million were current or less than 30 days past due under the modified terms. The increase in the renegotiated TDR portfolio was primarily driven by new renegotiated enrollments outpacing runoff of existing portfolios.

Commercial Portfolio Credit Risk Management

Credit risk management for the commercial portfolio begins with an assessment of the credit risk profile of the borrower or counterparty based on an analysis of its financial position. As part of the overall credit risk assessment, our commercial credit exposures are assigned a risk rating and are subject to approval based on defined credit approval standards. Subsequent to loan origination, risk ratings are monitored on an ongoing basis, and if necessary, adjusted to reflect changes in the financial condition, cash flow, risk profile or outlook of a borrower or counterparty. In making credit decisions, we consider risk rating, collateral, country, industry and single-name concentration limits while also balancing these considerations with the total borrower or counterparty relationship. We use a variety of tools to continuously monitor the ability of a borrower or counterparty to perform under its obligations. We use risk rating aggregations to measure and evaluate concentrations within portfolios. In addition, risk ratings are a factor in determining the level of allocated capital and the allowance for credit losses.

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

Management of Commercial Credit Risk Concentrations

Commercial credit risk is evaluated and managed with the goal that concentrations of credit exposure continue to be aligned with our risk appetite. We review, measure and manage concentrations of credit exposure by industry, product, geography, customer relationship and loan size. We also review, measure and manage commercial real estate loans by geographic location and property type. In addition, within our non-U.S. portfolio, we evaluate exposures by region and by country. Tables 37, 40, 43 and 44 summarize our concentrations. We also utilize syndications of exposure to third parties, loan sales, hedging and other risk mitigation techniques to manage the size and risk profile of the commercial credit portfolio. For more information on our industry concentrations, see Commercial Portfolio Credit Risk Management – Industry Concentrations on page 78 and Table 40.

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

In addition, we are a member of various securities and derivative exchanges and clearinghouses, both in the U.S. and other countries. As a member, we may be required to pay a pro-rata share of the losses incurred by some of these organizations as a result of another member default and under other loss scenarios. For additional information, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

Commercial Credit Portfolio

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

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

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

Table 33 Commercial Credit Exposure by Type

	Commercial Utilized (1)		Commercial Unfunded (2, 3, 4)		Total Commercial Committed	
	December 31					
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017
Loans and leases (5)	**$ 505,724**	$ 487,748	**$ 369,282**	$ 364,743	**$ 875,006**	$ 852,491
Derivative assets (6)	**43,725**	37,762	**—**	—	**43,725**	37,762
Standby letters of credit and financial guarantees	**34,941**	34,517	**491**	863	**35,432**	35,380
Debt securities and other investments	**25,425**	28,161	**4,250**	4,864	**29,675**	33,025
Loans held-for-sale	**9,090**	10,257	**14,812**	9,742	**23,902**	19,999
Commercial letters of credit	**1,210**	1,467	**168**	155	**1,378**	1,622
Other	**898**	888	**—**	—	**898**	888
Total	**$ 621,013**	$ 600,800	**$ 389,003**	$ 380,367	**$ 1,010,016**	$ 981,167

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

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

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

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

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

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

Outstanding commercial loans and leases increased $18.2 billion during 2018 primarily in the U.S. commercial portfolio. The allowance for loan and lease losses for the commercial portfolio decreased $211 million to $4.8 billion at December 31, 2018. For additional information, see Allowance for Credit Losses on page 82. Table 34 presents our commercial loans and leases portfolio and related credit quality information at December 31, 2018 and 2017.

Table 34 Commercial Credit Quality

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

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

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

Table 35 Commercial Net Charge-offs and Related Ratios

(Dollars in millions)	Net Charge-offs		Net Charge-off Ratios [1]	
	2018	2017	2018	2017
Commercial and industrial:				
U.S. commercial	$ 215	$ 232	0.07%	0.08%
Non-U.S. commercial	68	440	0.07	0.48
Total commercial and industrial	283	672	0.07	0.18
Commercial real estate	1	9	—	0.02
Commercial lease financing	(1)	5	(0.01)	0.02
	283	686	0.06	0.15
U.S. small business commercial	240	215	1.70	1.60
Total commercial	$ 523	$ 901	0.11	0.20

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

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

Table 36 Commercial Reservable Criticized Utilized Exposure [1, 2]

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

(1) Total commercial reservable criticized utilized exposure includes loans and leases of $10.3 billion and $12.5 billion and commercial letters of credit of $781 million and $1.1 billion at December 31, 2018 and 2017.
(2) Percentages are calculated as commercial reservable criticized utilized exposure divided by total commercial reservable utilized exposure for each exposure category.

Commercial and Industrial

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

U.S. Commercial

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

Non-U.S. Commercial

At December 31, 2018, 81 percent of the non-U.S. commercial loan portfolio was managed in *Global Banking* and 19 percent in *Global Markets*. Reservable criticized utilized exposure decreased $753 million, or 43 percent, and nonperforming loans and leases decreased $219 million, or 73 percent, due primarily to paydowns, sales and charge-offs. Net charge-offs decreased $372 million in 2018 primarily due to a single-name non-U.S. commercial charge-off of $292 million in 2017. For more information on the non-U.S. commercial portfolio, see Non-U.S. Portfolio on page 80.

Commercial Real Estate

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

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

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

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

Table 37 Outstanding Commercial Real Estate Loans

	December 31	
(Dollars in millions)	**2018**	2017
By Geographic Region		
California	**$ 14,002**	$ 13,607
Northeast	**10,895**	10,072
Southwest	**7,339**	6,970
Southeast	**5,726**	5,487
Midwest	**3,772**	3,769
Florida	**3,680**	3,170
Illinois	**2,989**	3,263
Midsouth	**2,919**	2,962
Northwest	**2,178**	2,657
Non-U.S.	**4,240**	3,538
Other [(1)]	**3,105**	2,803
Total outstanding commercial real estate loans	**$ 60,845**	$ 58,298
By Property Type		
Non-residential		
Office	**$ 17,246**	$ 16,718
Shopping centers / Retail	**8,798**	8,825
Multi-family rental	**7,762**	8,280
Hotels / Motels	**7,248**	6,344
Industrial / Warehouse	**5,379**	6,070
Unsecured	**2,956**	2,187
Multi-use	**2,848**	2,771
Other	**7,029**	5,645
Total non-residential	**59,266**	56,840
Residential	**1,579**	1,458
Total outstanding commercial real estate loans	**$ 60,845**	$ 58,298

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

U.S. Small Business Commercial

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

Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity

Table 38 presents the nonperforming commercial loans, leases and foreclosed properties activity during 2018 and 2017. Nonperforming loans do not include loans accounted for under the fair value option. During 2018, nonperforming commercial loans and leases decreased $202 million to $1.1 billion. At December 31, 2018, 93 percent of commercial nonperforming loans, leases and foreclosed properties were secured and 55 percent were contractually current. Commercial nonperforming loans were carried at 89 percent of their unpaid principal balance before consideration of the allowance for loan and lease losses as the carrying value of these loans has been reduced to the estimated collateral value less costs to sell.

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

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

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

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

Table 39 Commercial Troubled Debt Restructurings

	December 31, 2018			December 31, 2017		
(Dollars in millions)	Nonperforming	Performing	Total	Nonperforming	Performing	Total
Commercial and industrial:						
U.S. commercial	**$ 306**	**$ 1,092**	**$ 1,398**	$ 370	$ 866	$ 1,236
Non-U.S. commercial	**78**	**162**	**240**	11	219	230
Total commercial and industrial	**384**	**1,254**	**1,638**	381	1,085	1,466
Commercial real estate	**114**	**6**	**120**	38	9	47
Commercial lease financing	**3**	**68**	**71**	5	13	18
	501	**1,328**	**1,829**	424	1,107	1,531
U.S. small business commercial	**3**	**18**	**21**	4	15	19
Total commercial troubled debt restructurings	**$ 504**	**$ 1,346**	**$ 1,850**	$ 428	$ 1,122	$ 1,550

Industry Concentrations

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

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

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

Real Estate, our second largest industry concentration with committed exposure of $86.5 billion, increased $2.7 billion, or three percent, during 2018. For more information on the commercial real estate and related portfolios, see Commercial Portfolio Credit Risk Management – Commercial Real Estate on page 77.

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

Our energy-related committed exposure decreased $4.5 billion, or 12 percent, during 2018 to $32.3 billion. Energy sector net charge-offs were $31 million in 2018 compared to $156 million in 2017. Energy sector reservable criticized exposure decreased $833 million during 2018 to $787 million due to improvement in credit quality coupled with exposure reductions. The energy allowance for credit losses decreased $225 million during 2018 to $335 million.

Table 40 Commercial Credit Exposure by Industry [1]

	Commercial Utilized		Total Commercial Committed [2]	
	December 31			
(Dollars in millions)	**2018**	2017	**2018**	2017
Asset managers and funds	**$ 71,756**	$ 59,190	**$ 107,888**	$ 91,092
Real estate [3]	**65,328**	61,940	**86,514**	83,773
Capital goods	**39,192**	36,705	**75,080**	70,417
Finance companies	**36,662**	34,050	**56,659**	53,107
Healthcare equipment and services	**35,763**	37,780	**56,489**	57,256
Government and public education	**43,675**	48,684	**54,749**	58,067
Materials	**27,347**	24,001	**51,865**	47,386
Retailing	**25,333**	26,117	**47,507**	48,796
Consumer services	**25,702**	27,191	**43,298**	43,605
Food, beverage and tobacco	**23,586**	23,252	**42,745**	42,815
Commercial services and supplies	**22,623**	22,100	**39,349**	35,496
Energy	**13,727**	16,345	**32,279**	36,765
Transportation	**22,814**	21,704	**31,523**	29,946
Global commercial banks	**26,269**	29,491	**28,321**	31,764
Utilities	**12,035**	11,342	**27,623**	27,935
Technology hardware and equipment	**13,014**	10,728	**26,228**	22,071
Individuals and trusts	**18,643**	18,549	**25,019**	25,097
Media	**12,132**	19,155	**24,502**	33,955
Pharmaceuticals and biotechnology	**7,430**	5,653	**23,634**	18,623
Vehicle dealers	**17,603**	16,896	**20,446**	20,361
Consumer durables and apparel	**9,904**	8,859	**20,199**	17,296
Software and services	**8,809**	8,562	**19,172**	18,202
Insurance	**8,674**	6,411	**15,807**	12,990
Telecommunication services	**8,686**	6,389	**14,166**	13,108
Automobiles and components	**7,131**	5,988	**13,893**	13,318
Food and staples retailing	**4,787**	4,955	**9,093**	15,589
Religious and social organizations	**3,757**	4,454	**5,620**	6,318
Financial markets infrastructure (clearinghouses)	**2,382**	688	**4,107**	2,403
Other	**6,249**	3,621	**6,241**	3,616
Total commercial credit exposure by industry	**$ 621,013**	$ 600,800	**$ 1,010,016**	$ 981,167
Net credit default protection purchased on total commitments [4]			**$ (2,663)**	$ (2,129)

(1) Includes U.S. small business commercial exposure.
(2) Includes the notional amount of unfunded legally binding lending commitments net of amounts distributed (i.e., syndicated or participated) to other financial institutions. The distributed amounts were $10.7 billion and $11.0 billion at December 31, 2018 and 2017.
(3) Industries are viewed from a variety of perspectives to best isolate the perceived risks. For purposes of this table, the real estate industry is defined based on the primary business activity of the borrowers or counterparties using operating cash flows and primary source of repayment as key factors.
(4) Represents net notional credit protection purchased. For additional information, see Commercial Portfolio Credit Risk Management – Risk Mitigation.

Risk Mitigation

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

At December 31, 2018 and 2017, net notional credit default protection purchased in our credit derivatives portfolio to hedge our funded and unfunded exposures for which we elected the fair value option, as well as certain other credit exposures, was $2.7 billion and $2.1 billion. We recorded net losses of $2 million for 2018 compared to net losses of $66 million in 2017 on these positions. The gains and losses on these instruments were offset by gains and losses on the related exposures. The Value-at-Risk (VaR) results for these exposures are included in the fair value option portfolio information in Table 47. For additional information, see Trading Risk Management on page 86.

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

Table 41 Net Credit Default Protection by Maturity

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

Table 42 Net Credit Default Protection by Credit Exposure Debt Rating

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

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

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

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

Non-U.S. Portfolio

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

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

Non-U.S. exposure is presented on an internal risk management basis and includes sovereign and non-sovereign credit exposure, securities and other investments issued by or domiciled in countries other than the U.S.

Funded loans and loan equivalents include loans, leases, and other extensions of credit and funds, including letters of credit and due from placements. Unfunded commitments are the undrawn portion of legally binding commitments related to loans and loan equivalents. Net counterparty exposure includes the fair value of derivatives, including the counterparty risk associated with credit default swaps (CDS), and secured financing transactions. Securities and other investments are carried at fair value and long securities exposures are netted against short exposures with the same underlying issuer to, but not below, zero. Net country exposure represents country exposure less hedges and credit default protection purchased, net of credit default protection sold.

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

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

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

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

Markets have reacted negatively to the escalating tensions between the U.S. and several key trading partners. We are closely monitoring our exposures to tariff-sensitive industries and our international exposure, particularly to countries that account for a large percentage of U.S. trade.

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

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

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

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

Provision for Credit Losses

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

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

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

Allowance for Credit Losses

Allowance for Loan and Lease Losses

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

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

The second component of the allowance for loan and lease losses covers the remaining consumer and commercial loans and leases that have incurred losses that are not yet individually identifiable. The allowance for consumer (including credit card and other consumer loans) and certain homogeneous commercial loan and lease products is based on aggregated portfolio evaluations, which include both quantitative and qualitative components, generally by product type. Loss forecast models are utilized that consider a variety of factors including, but not limited to, historical loss experience, estimated defaults or foreclosures based on portfolio trends, delinquencies, economic trends and credit scores. Our consumer real estate loss forecast model estimates the portion of loans that will default based on individual loan attributes, the most significant of which are refreshed LTV or CLTV, and borrower credit score as well as vintage and geography, all of which are further broken down into current delinquency status. Additionally, we incorporate the delinquency status of underlying first-lien loans on our junior-lien home equity portfolio in our allowance process. Incorporating refreshed LTV and CLTV into our probability of default allows us to factor the impact of changes in home prices into our allowance for loan and lease losses. These loss forecast models are updated on a quarterly basis to incorporate information reflecting the current economic environment. As of December 31, 2018, the loss forecast process resulted in reductions in the allowance related to the residential mortgage and home equity portfolios compared to December 31, 2017.

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

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

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

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

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

The allowance for loan and lease losses for the commercial portfolio, as presented in Table 45, was $4.8 billion at December 31, 2018, a decrease of $211 million from December 31, 2017 primarily driven by improvement in energy exposures. Commercial reservable criticized utilized exposure decreased to $11.1 billion at December 31, 2018 from $13.6 billion (to 2.08 percent from 2.65 percent of total commercial reservable utilized exposure) at December 31, 2017, driven by broad-based improvements including the energy sector. Nonperforming commercial loans decreased to $1.1 billion at December 31, 2018 from $1.3 billion (to 0.22 percent from 0.27 percent of outstanding commercial loans excluding loans accounted for under the fair value option) at December 31, 2017. See Tables 34, 35 and 36 for more details on key commercial credit statistics.

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

Reserve for Unfunded Lending Commitments

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

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

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

(Dollars in millions)	December 31, 2018 Amount	Percent of Total	Percent of Loans and Leases Outstanding (1)	December 31, 2017 Amount	Percent of Total	Percent of Loans and Leases Outstanding (1)
Allowance for loan and lease losses						
Residential mortgage	$ 422	4.40%	0.20%	$ 701	6.74%	0.34%
Home equity	506	5.27	1.05	1,019	9.80	1.76
U.S. credit card	3,597	37.47	3.66	3,368	32.41	3.50
Direct/Indirect consumer	248	2.58	0.27	264	2.54	0.27
Other consumer	29	0.30	n/m	31	0.30	n/m
Total consumer	4,802	50.02	1.08	5,383	51.79	1.18
U.S. commercial (2)	3,010	31.35	0.96	3,113	29.95	1.04
Non-U.S. commercial	677	7.05	0.69	803	7.73	0.82
Commercial real estate	958	9.98	1.57	935	9.00	1.60
Commercial lease financing	154	1.60	0.68	159	1.53	0.72
Total commercial	4,799	49.98	0.97	5,010	48.21	1.05
Allowance for loan and lease losses (3)	9,601	100.00%	1.02	10,393	100.00%	1.12
Reserve for unfunded lending commitments	797			777		
Allowance for credit losses	$ 10,398			$ 11,170		

(1) Ratios are calculated as allowance for loan and lease losses as a percentage of loans and leases outstanding excluding loans accounted for under the fair value option. Consumer loans accounted for under the fair value option include residential mortgage loans of $336 million and $567 million and home equity loans of $346 million and $361 million at December 31, 2018 and 2017. Commercial loans accounted for under the fair value option include U.S. commercial loans of $2.5 billion and $2.6 billion and non-U.S. commercial loans of $1.1 billion and $2.2 billion at December 31, 2018 and 2017.

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

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

n/m = not meaningful

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

Table 46 Allowance for Credit Losses

(Dollars in millions)	2018	2017
Allowance for loan and lease losses, January 1	$ 10,393	$ 11,237
Loans and leases charged off		
Residential mortgage	(207)	(188)
Home equity	(483)	(582)
U.S. credit card	(3,345)	(2,968)
Non-U.S. credit card [1]	—	(103)
Direct/Indirect consumer	(495)	(491)
Other consumer	(197)	(212)
Total consumer charge-offs	(4,727)	(4,544)
U.S. commercial [2]	(575)	(589)
Non-U.S. commercial	(82)	(446)
Commercial real estate	(10)	(24)
Commercial lease financing	(8)	(16)
Total commercial charge-offs	(675)	(1,075)
Total loans and leases charged off	(5,402)	(5,619)
Recoveries of loans and leases previously charged off		
Residential mortgage	179	288
Home equity	485	369
U.S. credit card	508	455
Non-U.S. credit card [1]	—	28
Direct/Indirect consumer	300	277
Other consumer	15	49
Total consumer recoveries	1,487	1,466
U.S. commercial [3]	120	142
Non-U.S. commercial	14	6
Commercial real estate	9	15
Commercial lease financing	9	11
Total commercial recoveries	152	174
Total recoveries of loans and leases previously charged off	1,639	1,640
Net charge-offs	(3,763)	(3,979)
Write-offs of PCI loans	(273)	(207)
Provision for loan and lease losses	3,262	3,381
Other [4]	(18)	(39)
Allowance for loan and lease losses, December 31	9,601	10,393
Reserve for unfunded lending commitments, January 1	777	762
Provision for unfunded lending commitments	20	15
Reserve for unfunded lending commitments, December 31	797	777
Allowance for credit losses, December 31	$ 10,398	$ 11,170
Loan and allowance ratios:		
Loans and leases outstanding at December 31 [5]	$ 942,546	$ 931,039
Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [5]	1.02%	1.12%
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [6]	1.08	1.18
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [7]	0.97	1.05
Average loans and leases outstanding [5]	$ 927,531	$ 911,988
Net charge-offs as a percentage of average loans and leases outstanding [5, 8]	0.41%	0.44%
Net charge-offs and PCI write-offs as a percentage of average loans and leases outstanding [5]	0.44	0.46
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31 [5]	194	161
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs [8]	2.55	2.61
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs and PCI write-offs	2.38	2.48
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [9]	$ 4,031	$ 3,971
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases, excluding the allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [5, 9]	113%	99%

(1) Represents net charge-offs related to the non-U.S. credit card loan portfolio, which was sold in 2017.
(2) Includes U.S. small business commercial charge-offs of $287 million and $258 million in 2018 and 2017.
(3) Includes U.S. small business commercial recoveries of $47 million and $43 million in 2018 and 2017.
(4) Primarily represents the net impact of portfolio sales, consolidations and deconsolidations, foreign currency translation adjustments, transfers to held for sale and certain other reclassifications.
(5) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $4.3 billion and $5.7 billion at December 31, 2018 and 2017. Average loans accounted for under the fair value option were $5.5 billion and $6.7 billion in 2018 and 2017.
(6) Excludes consumer loans accounted for under the fair value option of $682 million and $928 million at December 31, 2018 and 2017.
(7) Excludes commercial loans accounted for under the fair value option of $3.7 billion and $4.8 billion at December 31, 2018 and 2017.
(8) Net charge-offs exclude $273 million and $207 million of write-offs in the PCI loan portfolio in 2018 and 2017. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 72.
(9) Primarily includes amounts allocated to U.S. credit card and unsecured consumer lending portfolios in *Consumer Banking* and PCI loans in *All Other*.

Market Risk Management

Market risk is the risk that changes in market conditions may adversely impact the value of assets or liabilities, or otherwise negatively impact earnings. This risk is inherent in the financial instruments associated with our operations, primarily within our *Global Markets* segment. We are also exposed to these risks in other areas of the Corporation (e.g., our ALM activities). In the event of market stress, these risks could have a material impact on our results. For more information, see Interest Rate Risk Management for the Banking Book on page 89.

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

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

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

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

Interest Rate Risk

Interest rate risk represents exposures to instruments whose values vary with the level or volatility of interest rates. These instruments include, but are not limited to, loans, debt securities, certain trading-related assets and liabilities, deposits, borrowings and derivatives. Hedging instruments used to mitigate these risks include derivatives such as options, futures, forwards and swaps.

Foreign Exchange Risk

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

Mortgage Risk

Mortgage risk represents exposures to changes in the values of mortgage-related instruments. The values of these instruments are sensitive to prepayment rates, mortgage rates, agency debt ratings, default, market liquidity, government participation and interest rate volatility. Our exposure to these instruments takes several forms. For example, we trade and engage in market-making activities in a variety of mortgage securities including whole loans, pass-through certificates, commercial mortgages and collateralized mortgage obligations including collateralized debt obligations using mortgages as underlying collateral. In addition, we originate a variety of MBS, which involves the accumulation of mortgage-related loans in anticipation of eventual securitization, and we may hold positions in mortgage securities and residential mortgage loans as part of the ALM portfolio. We also record MSRs as part of our mortgage origination activities. Hedging instruments used to mitigate this risk include derivatives such as options, swaps, futures and forwards as well as securities including MBS and U.S. Treasury securities. For more information, see Mortgage Banking Risk Management on page 91.

Equity Market Risk

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

Commodity Risk

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

Issuer Credit Risk

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

Market Liquidity Risk

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

Trading Risk Management

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

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

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

VaR may not be indicative of realized revenue volatility as changes in market conditions or in the composition of the portfolio can have a material impact on the results. In particular, the historical data used for the VaR calculation might indicate higher or lower levels of portfolio diversification than will be experienced. In order for the VaR model to reflect current market conditions, we update the historical data underlying our VaR model on a weekly basis, or more frequently during periods of market stress, and regularly review the assumptions underlying the model. A minor portion of risks related to our trading positions is not included in VaR. These risks are reviewed as part of our ICAAP. For more information regarding ICAAP, see Capital Management on page 58.

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

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

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

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

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

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

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

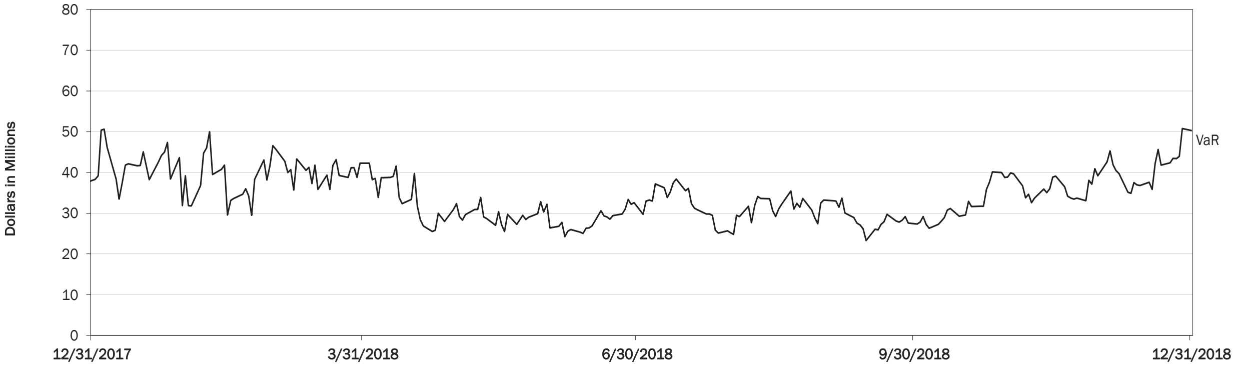
Table 47 Market Risk VaR for Trading Activities

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

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

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

Daily Total Covered Positions and Less Liquid Trading Portfolio VaR History



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

Table 48 Average Market Risk VaR for Trading Activities – 99 percent and 95 percent VaR Statistics

	2018		2017	
(Dollars in millions)	99 percent	95 percent	99 percent	95 percent
Foreign exchange	$ 8	$ 5	$ 11	$ 6
Interest rate	25	16	21	14
Credit	25	15	26	15
Equity	20	11	18	10
Commodities	8	4	5	3
Portfolio diversification	(55)	(33)	(47)	(30)
Total covered positions portfolio	31	18	34	18
Impact from less liquid exposures	3	1	6	2
Total covered positions and less liquid trading positions portfolio	34	19	40	20
Fair value option loans	11	6	10	6
Fair value option hedges	9	6	7	5
Fair value option portfolio diversification	(11)	(7)	(8)	(6)
Total fair value option portfolio	9	5	9	5
Portfolio diversification	(5)	(3)	(4)	(3)
Total market-based portfolio	$ 38	$ 21	$ 45	$ 22

Backtesting

The accuracy of the VaR methodology is evaluated by backtesting, which compares the daily VaR results, utilizing a one-day holding period, against a comparable subset of trading revenue. A backtesting excess occurs when a trading loss exceeds the VaR for the corresponding day. These excesses are evaluated to understand the positions and market moves that produced the trading loss with a goal to ensure that the VaR methodology accurately represents those losses. We expect the frequency of trading losses in excess of VaR to be in line with the confidence level of the VaR statistic being tested. For example, with a 99 percent confidence level, we expect one trading loss in excess of VaR every 100 days or between two to three trading losses in excess of VaR over the course of a year. The number of backtesting excesses observed can differ from the statistically expected number of excesses if the current level of market volatility is materially different than the level of market volatility that existed during the three years of historical data used in the VaR calculation.

The trading revenue used for backtesting is defined by regulatory agencies in order to most closely align with the VaR component of the regulatory capital calculation. This revenue differs from total trading-related revenue in that it excludes revenue from trading activities that either do not generate market risk or the market risk cannot be included in VaR. Some examples of the types of revenue excluded for backtesting are fees, commissions, reserves, net interest income and intraday trading revenues.

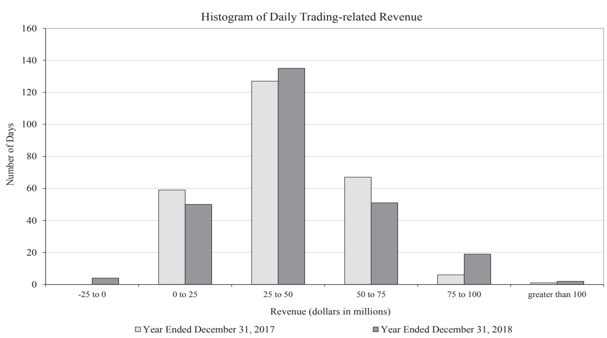
We conduct daily backtesting on the VaR results used for regulatory capital calculations as well as the VaR results for key legal entities, regions and risk factors. These results are reported to senior market risk management. Senior management regularly reviews and evaluates the results of these tests.

During 2018, there were three days in which there was a backtesting excess for our total covered portfolio VaR, utilizing a one-day holding period.

Total Trading-related Revenue

Total trading-related revenue, excluding brokerage fees, and CVA, DVA and funding valuation adjustment gains (losses), represents the total amount earned from trading positions, including market-based net interest income, which are taken in a diverse range of financial instruments and markets. Trading account assets and liabilities are reported at fair value. For more information on fair value, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements. Trading-related revenue can be volatile and is largely driven by general market conditions and customer demand. Also, trading-related revenue is dependent on the volume and type of transactions, the level of risk assumed, and the volatility of price and rate movements at any given time within the ever-changing market environment. Significant daily revenue by business is monitored and the primary drivers of these are reviewed.

The following histogram is a graphic depiction of trading volatility and illustrates the daily level of trading-related revenue for 2018 and 2017. During 2018, positive trading-related revenue was recorded for 98 percent of the trading days, of which 79 percent were daily trading gains of over $25 million. This compares to 2017 where positive trading-related revenue was recorded for 100 percent of the trading days, of which 77 percent were daily trading gains of over $25 million.



Trading Portfolio Stress Testing

Because the very nature of a VaR model suggests results can exceed our estimates and it is dependent on a limited historical window, we also stress test our portfolio using scenario analysis. This analysis estimates the change in the value of our trading portfolio that may result from abnormal market movements.

A set of scenarios, categorized as either historical or hypothetical, are computed daily for the overall trading portfolio and individual businesses. These scenarios include shocks to underlying market risk factors that may be well beyond the shocks found in the historical data used to calculate VaR. Historical scenarios simulate the impact of the market moves that occurred during a period of extended historical market stress. Generally, a multi-week period representing the most severe point during a crisis is selected for each historical scenario. Hypothetical scenarios provide estimated portfolio impacts from potential future market stress events. Scenarios are reviewed and updated in response to changing positions and new economic or political information. In addition, new or ad hoc scenarios are developed to address specific potential market events or particular vulnerabilities in the portfolio. The stress tests are reviewed on a regular basis and the results are presented to senior management.

Stress testing for the trading portfolio is integrated with enterprise-wide stress testing and incorporated into the limits framework. The macroeconomic scenarios used for enterprise-wide stress testing purposes differ from the typical trading portfolio scenarios in that they have a longer time horizon and the results are forecasted over multiple periods for use in consolidated capital and liquidity planning. For more information, see Managing Risk on page 55.

Interest Rate Risk Management for the Banking Book

The following discussion presents net interest income for banking book activities.

Interest rate risk represents the most significant market risk exposure to our banking book balance sheet. Interest rate risk is measured as the potential change in net interest income caused by movements in market interest rates. Client-facing activities, primarily lending and deposit-taking, create interest rate sensitive positions on our balance sheet.

We prepare forward-looking forecasts of net interest income. The baseline forecast takes into consideration expected future business growth, ALM positioning and the direction of interest rate movements as implied by the market-based forward curve. We then measure and evaluate the impact that alternative interest rate scenarios have on the baseline forecast in order to assess interest rate sensitivity under varied conditions. The net interest income forecast is frequently updated for changing assumptions and differing outlooks based on economic trends, market conditions and business strategies. Thus, we continually monitor our balance sheet position in order to maintain an acceptable level of exposure to interest rate changes.

The interest rate scenarios that we analyze incorporate balance sheet assumptions such as loan and deposit growth and pricing, changes in funding mix, product repricing, maturity characteristics and investment securities premium amortization. Our overall goal is to manage interest rate risk so that movements in interest rates do not significantly adversely affect earnings and capital.

Table 49 presents the spot and 12-month forward rates used in our baseline forecasts at December 31, 2018 and 2017.

Table 49 Forward Rates

	Federal Funds	Three-month LIBOR	10-Year Swap
	December 31, 2018		
Spot rates	**2.50%**	**2.81%**	**2.71%**
12-month forward rates	**2.50**	**2.64**	**2.75**
	December 31, 2017		
Spot rates	1.50%	1.69%	2.40%
12-month forward rates	2.00	2.14	2.48

Table 50 shows the pretax impact to forecasted net interest income over the next 12 months from December 31, 2018 and 2017, resulting from instantaneous parallel and non-parallel shocks to the market-based forward curve. Periodically we evaluate the scenarios presented so that they are meaningful in the context of the current rate environment.

During 2018, the asset sensitivity of our balance sheet to rising rates declined primarily due to increases in long-end rates. We continue to be asset sensitive to a parallel move in interest rates with the majority of that impact coming from the short end of the yield curve. Additionally, higher interest rates impact the fair value of debt securities and, accordingly, for debt securities classified as AFS, may adversely affect accumulated OCI and thus capital levels under the Basel 3 capital rules. Under instantaneous upward parallel shifts, the near-term adverse impact to Basel 3 capital is reduced over time by offsetting positive impacts to net interest income. For more information on Basel 3, see Capital Management – Regulatory Capital on page 59.

Table 50 Estimated Banking Book Net Interest Income Sensitivity to Curve Changes

(Dollars in millions)	Short Rate (bps)	Long Rate (bps)	December 31 2018	December 31 2017
Parallel Shifts				
+100 bps instantaneous shift	+100	+100	**$ 2,651**	$ 3,317
-100 bps instantaneous shift	-100	-100	**(4,109)**	(5,183)
Flatteners				
Short-end instantaneous change	+100	—	**1,977**	2,182
Long-end instantaneous change	—	-100	**(1,616)**	(2,765)
Steepeners				
Short-end instantaneous change	-100	—	**(2,478)**	(2,394)
Long-end instantaneous change	—	+100	**673**	1,135

The sensitivity analysis in Table 50 assumes that we take no action in response to these rate shocks and does not assume any change in other macroeconomic variables normally correlated with changes in interest rates. As part of our ALM activities, we use securities, certain residential mortgages, and interest rate and foreign exchange derivatives in managing interest rate sensitivity.

The behavior of our deposit portfolio in the baseline forecast and in alternate interest rate scenarios is a key assumption in our projected estimates of net interest income. The sensitivity analysis in Table 50 assumes no change in deposit portfolio size or mix from the baseline forecast in alternate rate environments. In higher rate scenarios, any customer activity resulting in the replacement of low-cost or noninterest-bearing deposits with higher yielding deposits or market-based funding would reduce our benefit in those scenarios.

Interest Rate and Foreign Exchange Derivative Contracts

Interest rate and foreign exchange derivative contracts are utilized in our ALM activities and serve as an efficient tool to manage our interest rate and foreign exchange risk. We use derivatives to hedge the variability in cash flows or changes in fair value on our balance sheet due to interest rate and foreign exchange components. For more information on our hedging activities, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

Our interest rate contracts are generally non-leveraged generic interest rate and foreign exchange basis swaps, options, futures and forwards. In addition, we use foreign exchange contracts, including cross-currency interest rate swaps, foreign currency futures contracts, foreign currency forward contracts and options to mitigate the foreign exchange risk associated with foreign currency-denominated assets and liabilities.

Changes to the composition of our derivatives portfolio during 2018 reflect actions taken for interest rate and foreign exchange rate risk management. The decisions to reposition our derivatives portfolio are based on the current assessment of economic and financial conditions including the interest rate and foreign currency environments, balance sheet composition and trends, and the relative mix of our cash and derivative positions.

We use interest rate derivative instruments to hedge the variability in the cash flows of our assets and liabilities and other forecasted transactions (collectively referred to as cash flow hedges). The net losses on both open and terminated cash flow hedge derivative instruments recorded in accumulated OCI were $1.3 billion, on a pretax basis, at both December 31, 2018 and 2017. These net losses are expected to be reclassified into earnings in the same period as the hedged cash flows affect earnings and will decrease income or increase expense on the respective hedged cash flows. Assuming no change in open cash flow derivative hedge positions and no changes in prices or interest rates beyond what is implied in forward yield curves at December 31, 2018, the pretax net losses are expected to be reclassified into earnings as follows: 25 percent within the next year, 56 percent in years two through five and 11 percent in years six through 10, with the remaining eight percent thereafter. For more information on derivatives designated as cash flow hedges, see *Note 3 – Derivatives* to the Consolidated Financial Statements.

We hedge our net investment in non-U.S. operations determined to have functional currencies other than the U.S. dollar using forward foreign exchange contracts that typically settle in less than 180 days, cross-currency basis swaps and foreign exchange options. We recorded net after-tax losses on derivatives in accumulated OCI associated with net investment hedges which were offset by gains on our net investments in consolidated non-U.S. entities at December 31, 2018.

Table 51 presents derivatives utilized in our ALM activities and shows the notional amount, fair value, weighted-average receive-fixed and pay-fixed rates, expected maturity and average estimated durations of our open ALM derivatives at December 31, 2018 and 2017. These amounts do not include derivative hedges on our MSRs.

Table 51 Asset and Liability Management Interest Rate and Foreign Exchange Contracts

	December 31, 2018								
		Expected Maturity							
(Dollars in millions, average estimated duration in years)	Fair Value	Total	2019	2020	2021	2022	2023	Thereafter	Average Estimated Duration
Receive-fixed interest rate swaps (1)	$ 2,128								5.17
Notional amount		$ 198,914	$ 27,176	$ 16,347	$ 14,640	$ 19,866	$ 36,215	$ 84,670	
Weighted-average fixed-rate		2.66%	1.87%	2.68%	3.17%	2.56%	2.37%	2.97%	
Pay-fixed interest rate swaps (1)	295								6.30
Notional amount		$ 49,275	$ 1,210	$ 4,344	$ 1,616	$ —	$ 10,801	$ 31,304	
Weighted-average fixed-rate		2.50%	2.07%	2.16%	2.22%	—%	2.59%	2.55%	
Same-currency basis swaps (2)	21								
Notional amount		$ 101,203	$ 7,628	$ 15,097	$ 15,493	$ 2,586	$ 2,017	$ 58,382	
Foreign exchange basis swaps (1, 3, 4)	(1,716)								
Notional amount		106,742	13,946	21,448	19,241	10,239	6,260	35,608	
Option products	2								
Notional amount		587	572	—	—	—	15	—	
Foreign exchange contracts (1, 4, 5)	82								
Notional amount (6)		(8,447)	(27,823)	13	4,196	2,741	2,448	9,978	
Net ALM contracts	$ 812								

For footnotes, see page 91.

Table 51 Asset and Liability Management Interest Rate and Foreign Exchange Contracts (continued)

	December 31, 2017								
		Expected Maturity							
(Dollars in millions, average estimated duration in years)	Fair Value	Total	2018	2019	2020	2021	2022	Thereafter	Average Estimated Duration
Receive-fixed interest rate swaps (1)	$ 2,330								5.38
Notional amount		$176,390	$ 21,850	$ 27,176	$ 16,347	$ 6,498	$ 19,120	$ 85,399	
Weighted-average fixed-rate		2.42%	3.20%	1.87%	1.88%	2.99%	2.10%	2.52%	
Pay-fixed interest rate swaps (1)	(37)								5.63
Notional amount		$ 45,873	$ 11,555	$ 1,210	$ 4,344	$ 1,616	$ —	$ 27,148	
Weighted-average fixed-rate		2.15%	1.73%	2.07%	2.16%	2.22%	—%	2.32%	
Same-currency basis swaps (2)	(17)								
Notional amount		$ 38,622	$ 11,028	$ 6,789	$ 1,180	$ 2,807	$ 955	$ 15,863	
Foreign exchange basis swaps (1, 3, 4)	(1,616)								
Notional amount		107,263	24,886	11,922	13,367	9,301	6,860	40,927	
Option products	13								
Notional amount		1,218	1,201	—	—	—	—	17	
Foreign exchange contracts (1, 4, 5)	1,424								
Notional amount (6)		(11,783)	(28,689)	2,231	(24)	2,471	2,919	9,309	
Net ALM contracts	$ 2,097								

(1) Does not include basis adjustments on either fixed-rate debt issued by the Corporation or AFS debt securities, which are hedged using derivatives designated as fair value hedging instruments, that substantially offset the fair values of these derivatives.

(2) At December 31, 2018 and 2017, the notional amount of same-currency basis swaps included $101.2 billion and $38.6 billion in both foreign currency and U.S. dollar-denominated basis swaps in which both sides of the swap are in the same currency.

(3) Foreign exchange basis swaps consisted of cross-currency variable interest rate swaps used separately or in conjunction with receive-fixed interest rate swaps.

(4) Does not include foreign currency translation adjustments on certain non-U.S. debt issued by the Corporation that substantially offset the fair values of these derivatives.

(5) The notional amount of foreign exchange contracts of $(8.4) billion at December 31, 2018 was comprised of $25.2 billion in foreign currency-denominated and cross-currency receive-fixed swaps, $(32.7) billion in net foreign currency forward rate contracts, $(1.8) billion in foreign currency-denominated pay-fixed swaps and $814 million in net foreign currency futures contracts. Foreign exchange contracts of $(11.8) billion at December 31, 2017 were comprised of $29.1 billion in foreign currency-denominated and cross-currency receive-fixed swaps, $(35.6) billion in net foreign currency forward rate contracts, $(6.2) billion in foreign currency-denominated pay-fixed swaps and $940 million in foreign currency futures contracts.

(6) Reflects the net of long and short positions. Amounts shown as negative reflect a net short position.

Mortgage Banking Risk Management

We originate, fund and service mortgage loans, which subject us to credit, liquidity and interest rate risks, among others. We determine whether loans will be held for investment or held for sale at the time of commitment and manage credit and liquidity risks by selling or securitizing a portion of the loans we originate.

Interest rate risk and market risk can be substantial in the mortgage business. Changes in interest rates and other market factors impact the volume of mortgage originations. Changes in interest rates also impact the value of interest rate lock commitments (IRLCs) and the related residential first mortgage LHFS between the date of the IRLC and the date the loans are sold to the secondary market. An increase in mortgage interest rates typically leads to a decrease in the value of these instruments. Conversely, when there is an increase in interest rates, the value of the MSRs will increase driven by lower prepayment expectations. Because the interest rate risks of these two hedged items offset, we combine them into one overall hedged item with one combined economic hedge portfolio consisting of derivative contracts and securities.

During 2018 and 2017, we recorded gains of $244 million and $118 million related to the change in fair value of the MSRs, IRLCs and LHFS, net of gains and losses on the hedge portfolio. For more information on MSRs, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements.

Compliance and Operational Risk Management

Compliance risk is the risk of legal or regulatory sanctions, material financial loss or damage to the reputation of the Corporation arising from the failure of the Corporation to comply with the requirements of applicable laws, rules, regulations and our internal policies and procedures (collectively, applicable laws, rules and regulations).

Operational risk is the risk of loss resulting from inadequate or failed processes, people and systems or from external events. Operational risk may occur anywhere in the Corporation, including third-party business processes, and is not limited to operations functions. Effects may extend beyond financial losses and may result in reputational risk impacts. Operational risk includes legal risk. Additionally, operational risk is a component in the calculation of total risk-weighted assets used in the Basel 3 capital calculation. For more information on Basel 3 calculations, see Capital Management on page 58.

FLUs and control functions are first and foremost responsible for managing all aspects of their businesses, including their compliance and operational risk. FLUs and control functions are required to understand their business processes and related risks and controls, including the related regulatory requirements, and monitor and report on the effectiveness of the control environment. In order to actively monitor and assess the performance of their processes and controls, they must conduct comprehensive quality assurance activities and identify issues and risks to remediate control gaps and weaknesses. FLUs and control functions must also adhere to compliance and operational risk appetite limits to meet strategic, capital and financial planning objectives. Finally, FLUs and control functions are responsible for the proactive identification, management and escalation of compliance and operational risks across the Corporation.

Global Compliance and Operational Risk teams independently assess compliance and operational risk, monitor business activities and processes, evaluate FLUs and control functions for adherence to applicable laws, rules and regulations, including identifying issues and risks, determining and developing tests to be conducted by the Enterprise Independent Testing unit, and reporting on the state of the control environment. Enterprise Independent Testing, an independent testing function within IRM, works with Global Compliance and Operational Risk, the FLUs and control functions in the identification of testing needs and test design, and is accountable for test execution, reporting and analysis of results.

The Corporation's approach to the management of compliance risk is described in the Global Compliance - Enterprise Policy, which outlines the requirements of the Corporation's compliance risk management program, and defines roles and responsibilities of FLUs, IRM and Corporate Audit, the three lines of defense in managing compliance risk. The requirements work together to drive a comprehensive risk-based approach for the proactive identification, management and escalation of compliance risks throughout the Corporation. For more information on FLUs and control functions, see Managing Risk on page 55.

The Corporation's approach to operational risk management is outlined in the Operational Risk Management - Enterprise Policy which establishes the requirements of the Corporation's operational risk management program and specifies the responsibilities and accountabilities of the first and second lines of defense for managing operational risk so that our business processes are designed and executed effectively.

The Global Compliance Enterprise Policy and Operational Risk Management - Enterprise Policy also set the requirements for reporting compliance and operational risk information to executive management as well as the Board or appropriate Board-level committees in support of Global Compliance and Operational Risk's responsibilities for conducting independent oversight of our compliance and operational risk management activities. The Board provides oversight of compliance risk through its Audit Committee and the ERC, and operational risk through the ERC.

A key operational risk facing the Corporation is information security, which includes cybersecurity. Cybersecurity risk represents, among other things, exposure to failures or interruptions of service or breaches of security, resulting from malicious technological attacks or otherwise, that impact the confidentiality, availability or integrity of our operations, systems or data, including sensitive corporate and customer information. The Corporation manages information security risk in accordance with internal policies which govern our comprehensive information security program designed to protect the Corporation by enabling preventative and detective measures to combat information and cybersecurity risks. The Board and the ERC provide cybersecurity and information security risk oversight for the Corporation and our Global Information Security Team manages the day-to-day implementation of our information security program.

Reputational Risk Management

Reputational risk is the risk that negative perceptions of the Corporation's conduct or business practices may adversely impact its profitability or operations. Reputational risk may result from many of the Corporation's activities, including those related to the management of our strategic, operational, compliance and credit risks.

The Corporation manages reputational risk through established policies and controls in its businesses and risk management processes to mitigate reputational risks in a timely manner and through proactive monitoring and identification of potential reputational risk events. If reputational risk events occur, we focus on remediating the underlying issue and taking action to minimize damage to the Corporation's reputation. The Corporation has processes and procedures in place to respond to events that give rise to reputational risk, including educating individuals and organizations that influence public opinion, implementing external communication strategies to mitigate the risk, and informing key stakeholders of potential reputational risks.

The Corporation's organization and governance structure provides oversight of reputational risks, and reputational risk reporting is provided regularly and directly to management and the ERC, which provides primary oversight of reputational risk. In addition, each FLU has a committee, which includes representatives from Compliance, Legal and Risk, that is responsible for the oversight of reputational risk. Such committees' oversight includes providing approval for business activities that present elevated levels of reputational risks.

Complex Accounting Estimates

Our significant accounting principles, as described in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements, are essential in understanding the Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A). Many of our significant accounting principles require complex judgments to estimate the values of assets and liabilities. We have procedures and processes in place to facilitate making these judgments.

The more judgmental estimates are summarized in the following discussion. We have identified and described the development of the variables most important in the estimation processes that involve mathematical models to derive the estimates. In many cases, there are numerous alternative judgments that could be used in the process of determining the inputs to the models. Where alternatives exist, we have used the factors that we believe represent the most reasonable value in developing the inputs. Actual performance that differs from our estimates of the key variables could materially impact our results of operations. Separate from the possible future impact to our results of operations from input and model variables, the value of our lending portfolio and market-sensitive assets and liabilities may change subsequent to the balance sheet date, often significantly, due to the nature and magnitude of future credit and market conditions. Such credit and market conditions may change quickly and in unforeseen ways and the resulting volatility could have a significant, negative effect on future operating results. These fluctuations would not be indicative of deficiencies in our models or inputs.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for loan and lease losses and the reserve for unfunded lending commitments, represents management's estimate of probable incurred credit losses in the Corporation's loan and lease portfolio excluding those loans accounted for under the fair value option. The allowance for credit losses includes both quantitative and qualitative components. The qualitative component has a higher degree of management subjectivity, and includes factors such as concentrations, economic conditions and other considerations. Our process for determining the allowance for credit losses is discussed in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

Our estimate for the allowance for loan and lease losses is sensitive to the loss rates and expected cash flows from our Consumer Real Estate and Credit Card and Other Consumer portfolio segments, as well as our U.S. small business commercial card portfolio within the Commercial portfolio segment. For each one-percent increase in the loss rates on loans collectively evaluated for impairment in our Consumer Real Estate portfolio segment, excluding PCI loans, coupled with a one-percent decrease in the discounted cash flows on those loans individually evaluated for impairment within this portfolio segment, the allowance for loan and lease losses at December 31, 2018 would have increased $24 million. We subject our PCI portfolio to stress scenarios to evaluate the potential impact given certain events. A one-percent decrease in the expected cash flows would result in a $41 million impairment of the portfolio. Within our Credit Card and Other Consumer portfolio segment and U.S. small business commercial card portfolio, for each one-percent increase in the loss rates on loans collectively evaluated for impairment coupled with a one-percent decrease in the expected cash flows on those loans individually evaluated for impairment, the allowance for loan and lease losses at December 31, 2018 would have increased $44 million.

Our allowance for loan and lease losses is sensitive to the risk ratings assigned to loans and leases within the Commercial portfolio segment (excluding the U.S. small business commercial card portfolio). Assuming a downgrade of one level in the internal risk ratings for commercial loans and leases, except loans and leases already classified as Substandard and Doubtful as defined by regulatory authorities, the allowance for loan and lease losses would have increased $2.5 billion at December 31, 2018.

The allowance for loan and lease losses as a percentage of total loans and leases at December 31, 2018 was 1.02 percent and these hypothetical increases in the allowance would raise the ratio to 1.30 percent.

These sensitivity analyses do not represent management's expectations of the deterioration in risk ratings or the increases in loss rates but are provided as hypothetical scenarios to assess the sensitivity of the allowance for loan and lease losses to changes in key inputs. We believe the risk ratings and loss severities currently in use are appropriate and that the probability of the alternative scenarios outlined above occurring within a short period of time is remote.

The process of determining the level of the allowance for credit losses requires a high degree of judgment. It is possible that others, given the same information, may at any point in time reach different reasonable conclusions.

Fair Value of Financial Instruments

Under applicable accounting standards, we are required to maximize the use of observable inputs and minimize the use of unobservable inputs in measuring fair value. We classify fair value measurements of financial instruments and MSRs based on the three-level fair value hierarchy in the accounting standards.

The fair values of assets and liabilities may include adjustments, such as market liquidity and credit quality, where appropriate. Valuations of products using models or other techniques are sensitive to assumptions used for the significant inputs. Where market data is available, the inputs used for valuation reflect that information as of our valuation date. Inputs to valuation models are considered unobservable if they are supported by little or no market activity. In periods of extreme volatility, lessened liquidity or in illiquid markets, there may be more variability in market pricing or a lack of market data to use in the valuation process. In keeping with the prudent application of estimates and management judgment in determining the fair value of assets and liabilities, we have in place various processes and controls that include: a model validation policy that requires review and approval of quantitative models used for deal pricing, financial statement fair value determination and risk quantification; a trading product valuation policy that requires verification of all traded product valuations; and a periodic review and substantiation of daily profit and loss reporting for all traded products. Primarily through validation controls, we utilize both broker and pricing service inputs which can and do include both market-observable and internally-modeled values and/or valuation inputs. Our reliance on this information is affected by our understanding of how the broker and/or pricing service develops its data with a higher degree of reliance applied to those that are more directly observable and lesser reliance applied to those developed through their own internal modeling. For example, broker quotes in less active markets may only be indicative and therefore less reliable. These processes and controls are performed independently of the business. For additional information, see *Note 20 – Fair Value Measurements* and *Note 21 – Fair Value Option* to the Consolidated Financial Statements.

Level 3 Assets and Liabilities

Financial assets and liabilities, and MSRs, where values are based on valuation techniques that require inputs that are both unobservable and are significant to the overall fair value measurement are classified as Level 3 under the fair value hierarchy established in applicable accounting standards. The fair value of these Level 3 financial assets and liabilities and MSRs is determined using pricing models, discounted cash flow methodologies or similar techniques for which the determination of fair value requires significant management judgment or estimation.

Level 3 financial instruments may be hedged with derivatives classified as Level 1 or 2; therefore, gains or losses associated with Level 3 financial instruments may be offset by gains or losses associated with financial instruments classified in other levels of the fair value hierarchy. The Level 3 gains and losses recorded in earnings did not have a significant impact on our liquidity or capital. We conduct a review of our fair value hierarchy classifications on a quarterly basis. Transfers into or out of Level 3 are made if the significant inputs used in the financial models measuring the fair values of the assets and liabilities became unobservable or observable, respectively, in the current marketplace. For more information on transfers into and out of Level 3 during 2018, 2017 and 2016, see *Note 20 – Fair Value Measurements* to the Consolidated Financial Statements.

Accrued Income Taxes and Deferred Tax Assets

Accrued income taxes, reported as a component of either other assets or accrued expenses and other liabilities on the Consolidated Balance Sheet, represent the net amount of current income taxes we expect to pay to or receive from various taxing jurisdictions attributable to our operations to date. We currently file income tax returns in more than 100 jurisdictions and consider many factors, including statutory, judicial and regulatory guidance, in estimating the appropriate accrued income taxes for each jurisdiction.

Net deferred tax assets, reported as a component of other assets on the Consolidated Balance Sheet, represent the net decrease in taxes expected to be paid in the future because of net operating loss (NOL) and tax credit carryforwards and because of future reversals of temporary differences in the bases of assets and liabilities as measured by tax laws and their bases as reported in the financial statements. NOL and tax credit carryforwards result in reductions to future tax liabilities, and many of these attributes can expire if not utilized within certain periods. We consider the need for valuation allowances to reduce net deferred tax assets to the amounts that we estimate are more likely than not to be realized.

Consistent with the applicable accounting guidance, we monitor relevant tax authorities and change our estimates of accrued income taxes and/or net deferred tax assets due to changes in income tax laws and their interpretation by the courts and regulatory authorities. These revisions of our estimates, which also may result from our income tax planning and from the resolution of income tax audit matters, may be material to our operating results for any given period.

See *Note 19 – Income Taxes* to the Consolidated Financial Statements for a table of significant tax attributes and additional information. For more information, see Item 1A. Risk Factors of our 2018 Annual Report on Form 10-K.

Goodwill and Intangible Assets

The nature of and accounting for goodwill and intangible assets are discussed in *Note 1 – Summary of Significant Accounting Principles*, and *Note 8 – Goodwill and Intangible Assets*. Beginning with our annual goodwill impairment test as of June 30, 2018, we conducted a qualitative assessment, rather than a quantitative assessment as previously performed, that is more fully described in *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

We completed our annual goodwill impairment test as of June 30, 2018 for all of our reporting units that had goodwill. We performed that test by assessing qualitative factors to determine whether it is more likely than not that the fair value of each reporting unit is less than its respective carrying value. Factors considered in the qualitative assessments include, among other things, macroeconomic conditions, industry and market considerations, financial performance of the respective reporting unit and other relevant entity- and reporting-unit specific considerations. If based on the results of the qualitative assessment, it is more likely than not that the fair value of a reporting unit is less than its carrying value, a quantitative assessment is performed.

Based on our qualitative assessments, we determined that for each reporting unit with goodwill, it was more likely than not that its respective fair value exceeded its carrying value, indicating there was no impairment. For more information regarding goodwill balances at June 30, 2018, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

Representations and Warranties Liability

The methodology used to estimate the liability for obligations under representations and warranties related to transfers of residential mortgage loans is a function of the type of representations and warranties provided in the sales contracts and considers a variety of factors. These factors, which incorporate judgment, are subject to change based on our specific experience. Our experience in negotiating settlements with trustees and other counterparties is an important input in determining our estimate of the liability. We also consider actual defaults, estimated future defaults, historical loss experience, estimated home prices and other economic conditions. Changes to any one of these factors could impact the estimate of our liability.

The representations and warranties provision may vary significantly each period as the methodology used to estimate the expense continues to be refined. The estimate of the liability for representations and warranties is sensitive to future defaults, loss severity and the net repurchase rate. An assumed simultaneous increase or decrease of 10 percent in estimated future defaults, loss severity and the net repurchase rate would result in an increase or decrease of approximately $200 million in the representations and warranties liability as of December 31, 2018. These sensitivities are hypothetical and are intended to provide an indication of the impact of a significant change in these key assumptions on the representations and warranties liability. In reality, changes in one assumption may result in changes in other assumptions, which may or may not counteract the sensitivity.

For more information on representations and warranties exposure, see *Note 12 – Commitments and Contingencies* to the Consolidated Financial Statements.

2017 Compared to 2016

The following discussion and analysis provide a comparison of our results of operations for 2017 and 2016. This discussion should be read in conjunction with the Consolidated Financial Statements and related Notes.

Overview

Net Income

Net income was $18.2 billion, or $1.56 per diluted share in 2017 compared to $17.8 billion, or $1.49 per diluted share in 2016. The results for 2017 included a charge of $2.9 billion related to the Tax Act. The pretax results for 2017 compared to 2016 were driven by higher revenue, largely the result of an increase in net interest income, lower provision for credit losses and a decline in noninterest expense.

Net Interest Income

Net interest income increased $3.6 billion to $44.7 billion in 2017 compared to 2016. Net interest yield on an FTE basis increased 12 bps to 2.37 percent for 2017. These increases were primarily driven by the benefits from higher interest rates and loan and deposit growth, partially offset by the sale of the non-U.S. consumer credit card business in the second quarter of 2017.

Noninterest Income

Noninterest income increased $80 million to $42.7 billion in 2017 compared to 2016. The following highlights the significant changes.

- Service charges increased $180 million primarily driven by the impact of pricing strategies and higher treasury services related revenue.
- Investment and brokerage services income increased $487 million primarily driven by the impact of AUM flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing.
- Investment banking income increased $770 million primarily due to higher advisory fees and higher debt and equity issuance fees.
- Trading account profits increased $375 million primarily due to increased client financing activity in equities, partially offset by weaker performance across most fixed-income products.
- Other income decreased $1.8 billion primarily due to lower mortgage banking income, with declines in both MSR results and production. Included in 2017 was a $793 million pretax gain recognized in connection with the sale of the non-U.S. consumer credit card business and a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act.

Provision for Credit Losses

The provision for credit losses decreased $201 million to $3.4 billion for 2017 compared to 2016 primarily due to reductions in energy exposures in the commercial portfolio and credit quality improvements in the consumer real estate portfolio. This was partially offset by portfolio seasoning and loan growth in the U.S. credit card portfolio and a single-name non-U.S. commercial charge-off.

Noninterest Expense

Noninterest expense decreased $340 million to $54.7 billion for 2017 compared to 2016. The decrease was primarily due to lower operating costs, a reduction from the sale of the non-U.S. consumer credit card business and lower litigation expense, partially offset by a $316 million impairment charge related to certain data centers that were in the process of being sold and

$145 million for the shared success discretionary year-end bonus awarded to certain employees.

Income Tax Expense

Tax expense for 2017 included a charge of $1.9 billion reflecting the impact of the Tax Act. Other than the impact of the Tax Act, the effective tax rate for 2017 was driven by our recurring tax preference benefits as well as an expense recognized in connection with the sale of the non-U.S. consumer credit card business, largely offset by benefits related to the adoption of the new accounting standard for the tax impact associated with share-based compensation, and the restructuring of certain subsidiaries. The effective tax rate for 2016 was driven by our recurring tax preferences and net tax benefits related to various tax audit matters, partially offset by a charge for the impact of U.K. tax law changes enacted in 2016.

Business Segment Operations

Consumer Banking

Net income for *Consumer Banking* increased $1.0 billion to $8.2 billion in 2017 compared to 2016 primarily driven by higher net interest income, partially offset by higher provision for credit losses and lower mortgage banking income which is included in other noninterest income. Net interest income increased $3.0 billion to $24.3 billion primarily due to the beneficial impact of an increase in investable assets as a result of higher deposits, as well as pricing discipline and loan growth. Noninterest income decreased $227 million to $10.2 billion driven by lower mortgage banking income, partially offset by higher card income and service charges. The provision for credit losses increased $810 million to $3.5 billion due to portfolio seasoning and loan growth in the U.S. credit card portfolio. Noninterest expense increased $131 million to $17.8 billion driven by higher personnel expense, including the shared success discretionary year-end bonus, and increased FDIC expense, as well as investments in digital capabilities and business growth. These increases were partially offset by improved operating efficiencies.

Global Wealth & Investment Management

Net income for *GWIM* increased $312 million to $3.1 billion in 2017 compared to 2016 due to higher revenue, partially offset by an increase in noninterest expense. Net interest income increased $414 million to $6.2 billion driven by higher short-term interest rates. Noninterest income, which primarily includes investment and brokerage services income, increased $526 million to $12.4 billion. The increase in noninterest income was driven by the impact of AUM flows and higher market valuations, partially offset by the impact of changing market dynamics on transactional revenue and AUM pricing. Noninterest expense increased $390 million to $13.6 billion primarily driven by higher revenue-related incentive costs.

Global Banking

Net income for *Global Banking* increased $1.2 billion to $7.0 billion in 2017 compared to 2016 driven by higher revenue and lower provision for credit losses. Revenue increased $1.6 billion to $20.0 billion driven by higher net interest income and noninterest income. Net interest income increased $1.0 billion to $10.5 billion due to loan and deposit-related growth, higher short-term rates on an increased deposit base and the impact of the allocation of ALM activities, partially offset by credit spread compression. Noninterest income increased $521 million to $9.5 billion largely due to higher investment banking fees. The provision for credit losses decreased $671 million to $212 million in 2017 primarily driven by reductions in energy exposures and continued portfolio improvement, partially offset by *Global Banking's* portion of a 2017 single-name non-U.S. commercial charge-off. Noninterest expense increased $110 million to $8.6 billion in 2017 primarily driven by higher investments in technology and higher deposit insurance, partially offset by lower litigation costs.

Global Markets

Net income for *Global Markets* decreased $524 million to $3.3 billion in 2017 compared to 2016. Net DVA losses were $428 million compared to losses of $238 million in 2016. Excluding net DVA, net income decreased $405 million to $3.6 billion primarily driven by higher noninterest expense, lower sales and trading revenue and an increase in the provision for credit losses, partially offset by higher investment banking fees. Sales and trading revenue, excluding net DVA, decreased $423 million primarily due to weaker performance in rates products and emerging markets. The provision for credit losses increased $133 million to $164 million in 2017, reflecting *Global Markets'* portion of a single-name non-U.S. commercial charge-off. Noninterest expense increased $560 million to $10.7 billion primarily due to higher litigation expense and continued investments in technology.

All Other

The net loss for *All Other* increased $1.6 billion to a net loss of $3.3 billion, driven by a charge of $2.9 billion due to enactment of the Tax Act. The pretax loss for 2017 compared to 2016 decreased $523 million reflecting lower noninterest expense and a larger benefit in the provision for credit losses, partially offset by a decline in revenue. Revenue declined $1.5 billion primarily due to lower mortgage banking income. All other noninterest loss decreased marginally and included a pretax gain of $793 million on the sale of the non-U.S. credit card business and a downward valuation adjustment of $946 million on tax-advantaged energy investments in connection with the Tax Act.

The benefit in the provision for credit losses increased $461 million to a benefit of $561 million primarily driven by continued runoff of the non-core portfolio, loan sale recoveries and the sale of the non-U.S. consumer credit card business.

Noninterest expense decreased $1.5 billion to $4.1 billion driven by lower litigation expense, lower personnel expense and a decline in non-core mortgage servicing costs.

The income tax benefit was $1.0 billion in 2017 compared to a benefit of $3.1 billion in 2016. The decrease in the tax benefit was driven by the impacts of the Tax Act. Both periods include income tax benefit adjustments to eliminate the FTE treatment of certain tax credits recorded in *Global Banking*.

Statistical Tables
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Table I Outstanding Loans and Leases

	December 31				
(Dollars in millions)	**2018**	2017	2016	2015	2014
Consumer					
Residential mortgage	**$ 208,557**	$ 203,811	$ 191,797	$ 187,911	$ 216,197
Home equity	**48,286**	57,744	66,443	75,948	85,725
U.S. credit card	**98,338**	96,285	92,278	89,602	91,879
Non-U.S. credit card	**—**	—	9,214	9,975	10,465
Direct/Indirect consumer [(1)]	**91,166**	96,342	95,962	90,149	81,386
Other consumer [(2)]	**202**	166	626	713	841
Total consumer loans excluding loans accounted for under the fair value option	**446,549**	454,348	456,320	454,298	486,493
Consumer loans accounted for under the fair value option [(3)]	**682**	928	1,051	1,871	2,077
Total consumer	**447,231**	455,276	457,371	456,169	488,570
Commercial					
U.S. commercial	**299,277**	284,836	270,372	252,771	220,293
Non-U.S. commercial	**98,776**	97,792	89,397	91,549	80,083
Commercial real estate [(4)]	**60,845**	58,298	57,355	57,199	47,682
Commercial lease financing	**22,534**	22,116	22,375	21,352	19,579
	481,432	463,042	439,499	422,871	367,637
U.S. small business commercial [(5)]	**14,565**	13,649	12,993	12,876	13,293
Total commercial loans excluding loans accounted for under the fair value option	**495,997**	476,691	452,492	435,747	380,930
Commercial loans accounted for under the fair value option [(3)]	**3,667**	4,782	6,034	5,067	6,604
Total commercial	**499,664**	481,473	458,526	440,814	387,534
Less: Loans of business held for sale [(6)]	**—**	—	(9,214)	—	—
Total loans and leases	**$ 946,895**	$ 936,749	$ 906,683	$ 896,983	$ 876,104

(1) Includes auto and specialty lending loans and leases of $50.1 billion, $52.4 billion, $50.7 billion, $43.9 billion and $38.7 billion, unsecured consumer lending loans of $383 million, $469 million, $585 million, $886 million and $1.5 billion, U.S. securities-based lending loans of $37.0 billion, $39.8 billion, $40.1 billion, $39.8 billion and $35.8 billion, non-U.S. consumer loans of $2.9 billion, $3.0 billion, $3.0 billion, $3.9 billion and $4.0 billion, student loans of $0, $0, $497 million, $564 million and $632 million, and other consumer loans of $746 million, $684 million, $1.1 billion, $1.0 billion and $761 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(2) Substantially all of other consumer at December 31, 2018 and 2017 is consumer overdrafts. Other consumer at December 31, 2016, 2015 and 2014 also includes consumer finance loans of $465 million, $564 million and $676 million, respectively.

(3) Consumer loans accounted for under the fair value option were residential mortgage loans of $336 million, $567 million, $710 million, $1.6 billion and $1.9 billion, and home equity loans of $346 million, $361 million, $341 million, $250 million and $196 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively. Commercial loans accounted for under the fair value option were U.S. commercial loans of $2.5 billion, $2.6 billion, $2.9 billion, $2.3 billion and $1.9 billion, and non-U.S. commercial loans of $1.1 billion, $2.2 billion, $3.1 billion, $2.8 billion and $4.7 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(4) Includes U.S. commercial real estate loans of $56.6 billion, $54.8 billion, $54.3 billion, $53.6 billion and $45.2 billion, and non-U.S. commercial real estate loans of $4.2 billion, $3.5 billion, $3.1 billion, $3.5 billion and $2.5 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(5) Includes card-related products.

(6) Represents non-U.S. credit card loans, which were included in assets of business held for sale on the Consolidated Balance Sheet.

Table II Nonperforming Loans, Leases and Foreclosed Properties (1)

(Dollars in millions)	December 31 2018	2017	2016	2015	2014
Consumer					
Residential mortgage	**$ 1,893**	$ 2,476	$ 3,056	$ 4,803	$ 6,889
Home equity	**1,893**	2,644	2,918	3,337	3,901
Direct/Indirect consumer	**56**	46	28	24	28
Other consumer	**—**	—	2	1	1
Total consumer (2)	**3,842**	5,166	6,004	8,165	10,819
Commercial					
U.S. commercial	**794**	814	1,256	867	701
Non-U.S. commercial	**80**	299	279	158	1
Commercial real estate	**156**	112	72	93	321
Commercial lease financing	**18**	24	36	12	3
	1,048	1,249	1,643	1,130	1,026
U.S. small business commercial	**54**	55	60	82	87
Total commercial (3)	**1,102**	1,304	1,703	1,212	1,113
Total nonperforming loans and leases	**4,944**	6,470	7,707	9,377	11,932
Foreclosed properties	**300**	288	377	459	697
Total nonperforming loans, leases and foreclosed properties	**$ 5,244**	$ 6,758	$ 8,084	$ 9,836	$ 12,629

(1) Balances do not include PCI loans even though the customer may be contractually past due. PCI loans were recorded at fair value upon acquisition and accrete interest income over the remaining life of the loan. In addition, balances do not include foreclosed properties insured by certain government-guaranteed loans, principally FHA-insured loans, that entered foreclosure of $488 million, $801 million, $1.2 billion, $1.4 billion and $1.1 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.

(2) In 2018, $625 million in interest income was estimated to be contractually due on $3.8 billion of consumer loans and leases classified as nonperforming at December 31, 2018, as presented in the table above, plus $6.8 billion of TDRs classified as performing at December 31, 2018. Approximately $388 million of the estimated $625 million in contractual interest was received and included in interest income for 2018.

(3) In 2018, $119 million in interest income was estimated to be contractually due on $1.1 billion of commercial loans and leases classified as nonperforming at December 31, 2018, as presented in the table above, plus $1.3 billion of TDRs classified as performing at December 31, 2018. Approximately $84 million of the estimated $119 million in contractual interest was received and included in interest income for 2018.

Table III Accruing Loans and Leases Past Due 90 Days or More (1)

(Dollars in millions)	December 31 2018	2017	2016	2015	2014
Consumer					
Residential mortgage (2)	**$ 1,884**	$ 3,230	$ 4,793	$ 7,150	$ 11,407
U.S. credit card	**994**	900	782	789	866
Non-U.S. credit card	**—**	—	66	76	95
Direct/Indirect consumer	**38**	40	34	39	64
Other consumer	**—**	—	4	3	1
Total consumer	**2,916**	4,170	5,679	8,057	12,433
Commercial					
U.S. commercial	**197**	144	106	113	110
Non-U.S. commercial	**—**	3	5	1	—
Commercial real estate	**4**	4	7	3	3
Commercial lease financing	**29**	19	19	15	40
	230	170	137	132	153
U.S. small business commercial	**84**	75	71	61	67
Total commercial	**314**	245	208	193	220
Total accruing loans and leases past due 90 days or more	**$ 3,230**	$ 4,415	$ 5,887	$ 8,250	$ 12,653

(1) Our policy is to classify consumer real estate-secured loans as nonperforming at 90 days past due, except the PCI loan portfolio, the fully-insured loan portfolio and loans accounted for under the fair value option.

(2) Balances are fully-insured loans.

Table IV Selected Loan Maturity Data [1, 2]

(Dollars in millions)	December 31, 2018 Due in One Year or Less	Due After One Year Through Five Years	Due After Five Years	Total
U.S. commercial	$ 74,365	$ 194,116	$ 47,888	**$ 316,369**
U.S. commercial real estate	11,622	40,393	4,590	**56,605**
Non-U.S. and other [3]	42,217	55,360	6,579	**104,156**
Total selected loans	**$ 128,204**	**$ 289,869**	**$ 59,057**	**$ 477,130**
Percent of total	27%	61%	12%	**100%**
Sensitivity of selected loans to changes in interest rates for loans due after one year:				
Fixed interest rates		$ 17,109	$ 27,664	
Floating or adjustable interest rates		272,760	31,393	
Total		**$ 289,869**	**$ 59,057**	

(1) Loan maturities are based on the remaining maturities under contractual terms.
(2) Includes loans accounted for under the fair value option.
(3) Loan maturities include non-U.S. commercial and commercial real estate loans.

Table V Allowance for Credit Losses

(Dollars in millions)	**2018**	2017	2016	2015	2014
Allowance for loan and lease losses, January 1	**$ 10,393**	$ 11,237	$ 12,234	$ 14,419	$ 17,428
Loans and leases charged off					
Residential mortgage	**(207)**	(188)	(403)	(866)	(855)
Home equity	**(483)**	(582)	(752)	(975)	(1,364)
U.S. credit card	**(3,345)**	(2,968)	(2,691)	(2,738)	(3,068)
Non-U.S. credit card [1]	**—**	(103)	(238)	(275)	(357)
Direct/Indirect consumer	**(495)**	(491)	(392)	(383)	(456)
Other consumer	**(197)**	(212)	(232)	(224)	(268)
Total consumer charge-offs	**(4,727)**	(4,544)	(4,708)	(5,461)	(6,368)
U.S. commercial [2]	**(575)**	(589)	(567)	(536)	(584)
Non-U.S. commercial	**(82)**	(446)	(133)	(59)	(35)
Commercial real estate	**(10)**	(24)	(10)	(30)	(29)
Commercial lease financing	**(8)**	(16)	(30)	(19)	(10)
Total commercial charge-offs	**(675)**	(1,075)	(740)	(644)	(658)
Total loans and leases charged off	**(5,402)**	(5,619)	(5,448)	(6,105)	(7,026)
Recoveries of loans and leases previously charged off					
Residential mortgage	**179**	288	272	393	969
Home equity	**485**	369	347	339	457
U.S. credit card	**508**	455	422	424	430
Non-U.S. credit card [1]	**—**	28	63	87	115
Direct/Indirect consumer	**300**	277	258	271	287
Other consumer	**15**	49	27	31	39
Total consumer recoveries	**1,487**	1,466	1,389	1,545	2,297
U.S. commercial [3]	**120**	142	175	172	214
Non-U.S. commercial	**14**	6	13	5	1
Commercial real estate	**9**	15	41	35	112
Commercial lease financing	**9**	11	9	10	19
Total commercial recoveries	**152**	174	238	222	346
Total recoveries of loans and leases previously charged off	**1,639**	1,640	1,627	1,767	2,643
Net charge-offs	**(3,763)**	(3,979)	(3,821)	(4,338)	(4,383)
Write-offs of PCI loans	**(273)**	(207)	(340)	(808)	(810)
Provision for loan and lease losses	**3,262**	3,381	3,581	3,043	2,231
Other [4]	**(18)**	(39)	(174)	(82)	(47)
Total allowance for loan and lease losses, December 31	**9,601**	10,393	11,480	12,234	14,419
Less: Allowance included in assets of business held for sale [5]	**—**	—	(243)	—	—
Allowance for loan and lease losses, December 31	**9,601**	10,393	11,237	12,234	14,419
Reserve for unfunded lending commitments, January 1	**777**	762	646	528	484
Provision for unfunded lending commitments	**20**	15	16	118	44
Other [4]	**—**	—	100	—	—
Reserve for unfunded lending commitments, December 31	**797**	777	762	646	528
Allowance for credit losses, December 31	**$ 10,398**	$ 11,170	$ 11,999	$ 12,880	$ 14,947

(1) Represents net charge-offs related to the non-U.S. credit card loan portfolio, which was sold in 2017.
(2) Includes U.S. small business commercial charge-offs of $287 million, $258 million, $253 million, $282 million and $345 million in 2018, 2017, 2016, 2015 and 2014, respectively.
(3) Includes U.S. small business commercial recoveries of $47 million, $43 million, $45 million, $57 million and $63 million in 2018, 2017, 2016, 2015 and 2014, respectively.
(4) Primarily represents the net impact of portfolio sales, consolidations and deconsolidations, foreign currency translation adjustments, transfers to held for sale and certain other reclassifications.
(5) Represents allowance related to the non-U.S. credit card loan portfolio, which was sold in 2017.

Table V Allowance for Credit Losses (continued)

(Dollars in millions)	2018	2017	2016	2015	2014
Loan and allowance ratios [6]**:**					
Loans and leases outstanding at December 31 [7]	**$ 942,546**	$ 931,039	$ 908,812	$ 890,045	$ 867,422
Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [7]	**1.02%**	1.12%	1.26%	1.37%	1.66%
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [8]	**1.08**	1.18	1.36	1.63	2.05
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [9]	**0.97**	1.05	1.16	1.11	1.16
Average loans and leases outstanding [7]	**$ 927,531**	$ 911,988	$ 892,255	$ 869,065	$ 888,804
Net charge-offs as a percentage of average loans and leases outstanding [7, 10]	**0.41%**	0.44%	0.43%	0.50%	0.49%
Net charge-offs and PCI write-offs as a percentage of average loans and leases outstanding [7]	**0.44**	0.46	0.47	0.59	0.58
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31 [7]	**194**	161	149	130	121
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs [10]	**2.55**	2.61	3.00	2.82	3.29
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs and PCI write-offs	**2.38**	2.48	2.76	2.38	2.78
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [11]	**$ 4,031**	$ 3,971	$ 3,951	$ 4,518	$ 5,944
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases, excluding the allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [7, 11]	**113%**	99%	98%	82%	71%

(6) Loan and allowance ratios for 2016 include $243 million of non-U.S. credit card allowance for loan and lease losses and $9.2 billion of ending non-U.S. credit card loans, which were sold in 2017.
(7) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $4.3 billion, $5.7 billion, $7.1 billion, $6.9 billion and $8.7 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively. Average loans accounted for under the fair value option were $5.5 billion, $6.7 billion, $8.2 billion, $7.7 billion and $9.9 billion in 2018, 2017, 2016, 2015 and 2014, respectively.
(8) Excludes consumer loans accounted for under the fair value option of $682 million, $928 million, $1.1 billion, $1.9 billion and $2.1 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.
(9) Excludes commercial loans accounted for under the fair value option of $3.7 billion, $4.8 billion, $6.0 billion, $5.1 billion and $6.6 billion at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.
(10) Net charge-offs exclude $273 million, $207 million, $340 million, $808 million and $810 million of write-offs in the PCI loan portfolio in 2018, 2017, 2016, 2015 and 2014 respectively. For more information on PCI write-offs, see Consumer Portfolio Credit Risk Management – Purchased Credit-impaired Loan Portfolio on page 72.
(11) Primarily includes amounts allocated to U.S. credit card and unsecured consumer lending portfolios in *Consumer Banking* and PCI loans and the non-U.S. credit card portfolio in *All Other*.

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

	December 31									
	2018		2017		2016		2015		2014	
(Dollars in millions)	**Amount**	**Percent of Total**	Amount	Percent of Total	Amount	Percent of Total	Amount	Percent of Total	Amount	Percent of Total
Allowance for loan and lease losses										
Residential mortgage	**$ 422**	**4.40%**	$ 701	6.74%	$ 1,012	8.82%	$ 1,500	12.26%	$ 2,900	20.11%
Home equity	**506**	**5.27**	1,019	9.80	1,738	15.14	2,414	19.73	3,035	21.05
U.S. credit card	**3,597**	**37.47**	3,368	32.41	2,934	25.56	2,927	23.93	3,320	23.03
Non-U.S. credit card	**—**	**—**	—	—	243	2.12	274	2.24	369	2.56
Direct/Indirect consumer	**248**	**2.58**	264	2.54	244	2.13	223	1.82	299	2.07
Other consumer	**29**	**0.30**	31	0.30	51	0.44	47	0.38	59	0.41
Total consumer	**4,802**	**50.02**	5,383	51.79	6,222	54.21	7,385	60.36	9,982	69.23
U.S. commercial [1]	**3,010**	**31.35**	3,113	29.95	3,326	28.97	2,964	24.23	2,619	18.16
Non-U.S. commercial	**677**	**7.05**	803	7.73	874	7.61	754	6.17	649	4.50
Commercial real estate	**958**	**9.98**	935	9.00	920	8.01	967	7.90	1,016	7.05
Commercial lease financing	**154**	**1.60**	159	1.53	138	1.20	164	1.34	153	1.06
Total commercial	**4,799**	**49.98**	5,010	48.21	5,258	45.79	4,849	39.64	4,437	30.77
Total allowance for loan and lease losses [2]	**9,601**	**100.00%**	10,393	100.00%	11,480	100.00%	12,234	100.00%	14,419	100.00%
Less: Allowance included in assets of business held for sale [3]	**—**		—		(243)		—		—	
Allowance for loan and lease losses	**9,601**		10,393		11,237		12,234		14,419	
Reserve for unfunded lending commitments	**797**		777		762		646		528	
Allowance for credit losses	**$ 10,398**		$ 11,170		$ 11,999		$ 12,880		$ 14,947	

(1) Includes allowance for loan and lease losses for U.S. small business commercial loans of $474 million, $439 million, $416 million, $507 million and $536 million at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.
(2) Includes $91 million, $289 million, $419 million, $804 million and $1.7 billion of valuation allowance presented with the allowance for loan and lease losses related to PCI loans at December 31, 2018, 2017, 2016, 2015 and 2014, respectively.
(3) Represents allowance for loan and lease losses related to the non-U.S. credit card loan portfolio, which was sold in 2017.

Financial Statements and Notes
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Report of Management on Internal Control Over Financial Reporting

Bank of America Corporation and Subsidiaries

The management of Bank of America Corporation is responsible for establishing and maintaining adequate internal control over financial reporting.

The Corporation's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. The Corporation's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Corporation; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures of the Corporation are being made only in accordance with authorizations of management and directors of the Corporation; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the Corporation's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Corporation's internal control over financial reporting as of December 31, 2018 based on the framework set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control – Integrated Framework (2013)*. Based on that assessment, management concluded that, as of December 31, 2018, the Corporation's internal control over financial reporting is effective.

The Corporation's internal control over financial reporting as of December 31, 2018 has been audited by PricewaterhouseCoopers, LLP, an independent registered public accounting firm, as stated in their accompanying report which expresses an unqualified opinion on the effectiveness of the Corporation's internal control over financial reporting as of December 31, 2018.

Brian T. Moynihan
Chairman, Chief Executive Officer and President

Paul M. Donofrio
Chief Financial Officer

Report of Independent Registered Public Accounting Firm

Bank of America Corporation and Subsidiaries

To the Board of Directors and Shareholders of Bank of America Corporation:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Bank of America Corporation and its subsidiaries as of December 31, 2018 and December 31, 2017, and the related consolidated statements of income, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Corporation's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Corporation as of December 31, 2018 and December 31, 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Corporation maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Corporation's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Report of Management on Internal Control Over Financial Reporting. Our responsibility is to express opinions on the Corporation's consolidated financial statements and on the Corporation's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Corporation in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

PricewaterhouseCoopers LLP

Charlotte, North Carolina
February 26, 2019

We have served as the Corporation's auditor since 1958.

Consolidated Statement of Income

(In millions, except per share information)	2018	2017	2016
Interest income			
Loans and leases	$ 40,811	$ 36,221	$ 33,228
Debt securities	11,724	10,471	9,167
Federal funds sold and securities borrowed or purchased under agreements to resell	3,176	2,390	1,118
Trading account assets	4,811	4,474	4,423
Other interest income	6,247	4,023	3,121
Total interest income	66,769	57,579	51,057
Interest expense			
Deposits	4,495	1,931	1,015
Short-term borrowings	5,839	3,538	2,350
Trading account liabilities	1,358	1,204	1,018
Long-term debt	7,645	6,239	5,578
Total interest expense	19,337	12,912	9,961
Net interest income	47,432	44,667	41,096
Noninterest income			
Card income	6,051	5,902	5,851
Service charges	7,767	7,818	7,638
Investment and brokerage services	14,160	13,836	13,349
Investment banking income	5,327	6,011	5,241
Trading account profits	8,540	7,277	6,902
Other income	1,970	1,841	3,624
Total noninterest income	43,815	42,685	42,605
Total revenue, net of interest expense	91,247	87,352	83,701
Provision for credit losses	3,282	3,396	3,597
Noninterest expense			
Personnel	31,880	31,931	32,018
Occupancy	4,066	4,009	4,038
Equipment	1,705	1,692	1,804
Marketing	1,674	1,746	1,703
Professional fees	1,699	1,888	1,971
Data processing	3,222	3,139	3,007
Telecommunications	699	699	746
Other general operating	8,436	9,639	9,796
Total noninterest expense	53,381	54,743	55,083
Income before income taxes	34,584	29,213	25,021
Income tax expense	6,437	10,981	7,199
Net income	$ 28,147	$ 18,232	$ 17,822
Preferred stock dividends	1,451	1,614	1,682
Net income applicable to common shareholders	$ 26,696	$ 16,618	$ 16,140
Per common share information			
Earnings	$ 2.64	$ 1.63	$ 1.57
Diluted earnings	2.61	1.56	1.49
Average common shares issued and outstanding	10,096.5	10,195.6	10,284.1
Average diluted common shares issued and outstanding	10,236.9	10,778.4	11,046.8

Consolidated Statement of Comprehensive Income

(Dollars in millions)	2018	2017	2016
Net income	$ 28,147	$ 18,232	$ 17,822
Other comprehensive income (loss), net-of-tax:			
Net change in debt and equity securities	(3,953)	61	(1,345)
Net change in debit valuation adjustments	749	(293)	(156)
Net change in derivatives	(53)	64	182
Employee benefit plan adjustments	(405)	288	(524)
Net change in foreign currency translation adjustments	(254)	86	(87)
Other comprehensive income (loss)	(3,916)	206	(1,930)
Comprehensive income	$ 24,231	$ 18,438	$ 15,892

See accompanying Notes to Consolidated Financial Statements.

Consolidated Balance Sheet

(Dollars in millions)	December 31 2018	2017
Assets		
Cash and due from banks	$ 29,063	$ 29,480
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	148,341	127,954
Cash and cash equivalents	177,404	157,434
Time deposits placed and other short-term investments	7,494	11,153
Federal funds sold and securities borrowed or purchased under agreements to resell (includes **$56,399** and $52,906 measured at fair value)	261,131	212,747
Trading account assets (includes **$119,363** and $106,274 pledged as collateral)	214,348	209,358
Derivative assets	43,725	37,762
Debt securities:		
Carried at fair value	238,101	315,117
Held-to-maturity, at cost (fair value – **$200,435** and $123,299)	203,652	125,013
Total debt securities	441,753	440,130
Loans and leases (includes **$4,349** and $5,710 measured at fair value)	946,895	936,749
Allowance for loan and lease losses	(9,601)	(10,393)
Loans and leases, net of allowance	937,294	926,356
Premises and equipment, net	9,906	9,247
Goodwill	68,951	68,951
Loans held-for-sale (includes **$2,942** and $2,156 measured at fair value)	10,367	11,430
Customer and other receivables	65,814	61,623
Other assets (includes **$19,739** and $22,581 measured at fair value)	116,320	135,043
Total assets	$ 2,354,507	$ 2,281,234
Liabilities		
Deposits in U.S. offices:		
Noninterest-bearing	$ 412,587	$ 430,650
Interest-bearing (includes **$492** and $449 measured at fair value)	891,636	796,576
Deposits in non-U.S. offices:		
Noninterest-bearing	14,060	14,024
Interest-bearing	63,193	68,295
Total deposits	1,381,476	1,309,545
Federal funds purchased and securities loaned or sold under agreements to repurchase (includes **$28,875** and $36,182 measured at fair value)	186,988	176,865
Trading account liabilities	68,220	81,187
Derivative liabilities	37,891	34,300
Short-term borrowings (includes **$1,648** and $1,494 measured at fair value)	20,189	32,666
Accrued expenses and other liabilities (includes **$20,075** and $22,840 measured at fair value and **$797** and $777 of reserve for unfunded lending commitments)	165,078	152,123
Long-term debt (includes **$27,637** and $31,786 measured at fair value)	229,340	227,402
Total liabilities	2,089,182	2,014,088
Commitments and contingencies *(Note 7 – Securitizations and Other Variable Interest Entities* and *Note 12 – Commitments and Contingencies)*		
Shareholders' equity		
Preferred stock, $0.01 par value; authorized – **100,000,000** shares; issued and outstanding – **3,843,140** and 3,837,683 shares	22,326	22,323
Common stock and additional paid-in capital, $0.01 par value; authorized – **12,800,000,000** shares; issued and outstanding – **9,669,286,370** and 10,287,302,431 shares	118,896	138,089
Retained earnings	136,314	113,816
Accumulated other comprehensive income (loss)	(12,211)	(7,082)
Total shareholders' equity	265,325	267,146
Total liabilities and shareholders' equity	$ 2,354,507	$ 2,281,234

	2018	2017
Assets of consolidated variable interest entities included in total assets above (isolated to settle the liabilities of the variable interest entities)		
Trading account assets	$ 5,798	$ 6,521
Loans and leases	43,850	48,929
Allowance for loan and lease losses	(912)	(1,016)
Loans and leases, net of allowance	42,938	47,913
All other assets	337	1,721
Total assets of consolidated variable interest entities	$ 49,073	$ 56,155
Liabilities of consolidated variable interest entities included in total liabilities above		
Short-term borrowings	$ 742	$ 312
Long-term debt (includes **$10,943** and $9,872 of non-recourse debt)	10,944	9,873
All other liabilities (includes **$27** and $34 of non-recourse liabilities)	30	37
Total liabilities of consolidated variable interest entities	$ 11,716	$ 10,222

See accompanying Notes to Consolidated Financial Statements.

Consolidated Statement of Changes in Shareholders' Equity

(In millions)	Preferred Stock	Common Stock and Additional Paid-in Capital Shares	Common Stock and Additional Paid-in Capital Amount	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Shareholders' Equity
Balance, December 31, 2015	$ 22,273	10,380.3	$ 151,042	$ 87,658	$ (5,358)	$ 255,615
Net income				17,822		17,822
Net change in debt and equity securities					(1,345)	(1,345)
Net change in debit valuation adjustments					(156)	(156)
Net change in derivatives					182	182
Employee benefit plan adjustments					(524)	(524)
Net change in foreign currency translation adjustments					(87)	(87)
Dividends declared:						
Common				(2,573)		(2,573)
Preferred				(1,682)		(1,682)
Issuance of preferred stock	2,947					2,947
Common stock issued under employee plans, net, and related tax effects		5.1	1,108			1,108
Common stock repurchased		(332.8)	(5,112)			(5,112)
Balance, December 31, 2016	$ 25,220	10,052.6	$ 147,038	$ 101,225	$ (7,288)	$ 266,195
Net income				18,232		18,232
Net change in debt and equity securities					61	61
Net change in debit valuation adjustments					(293)	(293)
Net change in derivatives					64	64
Employee benefit plan adjustments					288	288
Net change in foreign currency translation adjustments					86	86
Dividends declared:						
Common				(4,027)		(4,027)
Preferred				(1,578)		(1,578)
Common stock issued in connection with exercise of warrants and exchange of preferred stock	(2,897)	700.0	2,933	(36)		—
Common stock issued under employee plans, net, and other		43.3	932			932
Common stock repurchased		(508.6)	(12,814)			(12,814)
Balance, December 31, 2017	$ 22,323	10,287.3	$ 138,089	$ 113,816	$ (7,082)	$ 267,146
Cumulative adjustment for adoption of hedge accounting standard				**(32)**	**57**	**25**
Adoption of accounting standard related to certain tax effects stranded in accumulated other comprehensive income (loss)				**1,270**	**(1,270)**	**—**
Net income				**28,147**		**28,147**
Net change in debt and equity securities					**(3,953)**	**(3,953)**
Net change in debit valuation adjustments					**749**	**749**
Net change in derivatives					**(53)**	**(53)**
Employee benefit plan adjustments					**(405)**	**(405)**
Net change in foreign currency translation adjustments					**(254)**	**(254)**
Dividends declared:						
Common				**(5,424)**		**(5,424)**
Preferred				**(1,451)**		**(1,451)**
Issuance of preferred stock	**4,515**					**4,515**
Redemption of preferred stock	**(4,512)**					**(4,512)**
Common stock issued under employee plans, net, and other		**58.2**	**901**	**(12)**		**889**
Common stock repurchased		**(676.2)**	**(20,094)**			**(20,094)**
Balance, December 31, 2018	**$ 22,326**	**9,669.3**	**$ 118,896**	**$ 136,314**	**$ (12,211)**	**$ 265,325**

See accompanying Notes to Consolidated Financial Statements.

Consolidated Statement of Cash Flows

(Dollars in millions)	2018	2017	2016
Operating activities			
Net income	$ 28,147	$ 18,232	$ 17,822
Adjustments to reconcile net income to net cash provided by operating activities:			
Provision for credit losses	3,282	3,396	3,597
Gains on sales of debt securities	(154)	(255)	(490)
Depreciation and premises improvements amortization	1,525	1,482	1,511
Amortization of intangibles	538	621	730
Net amortization of premium/discount on debt securities	1,824	2,251	3,134
Deferred income taxes	3,041	8,175	5,793
Stock-based compensation	1,729	1,649	1,367
Loans held-for-sale:			
Originations and purchases	(28,071)	(43,506)	(33,107)
Proceeds from sales and paydowns of loans originally classified as held for sale and instruments from related securitization activities	28,972	40,548	32,588
Net change in:			
Trading and derivative instruments	(23,673)	(14,663)	(2,635)
Other assets	11,920	(20,090)	(14,103)
Accrued expenses and other liabilities	13,010	4,673	(35)
Other operating activities, net	(2,570)	7,351	1,105
Net cash provided by operating activities	39,520	9,864	17,277
Investing activities			
Net change in:			
Time deposits placed and other short-term investments	3,659	(1,292)	(2,117)
Federal funds sold and securities borrowed or purchased under agreements to resell	(48,384)	(14,523)	(5,742)
Debt securities carried at fair value:			
Proceeds from sales	5,117	73,353	71,547
Proceeds from paydowns and maturities	78,513	93,874	108,592
Purchases	(76,640)	(166,975)	(189,061)
Held-to-maturity debt securities:			
Proceeds from paydowns and maturities	18,789	16,653	18,677
Purchases	(35,980)	(25,088)	(39,899)
Loans and leases:			
Proceeds from sales of loans originally classified as held for investment and instruments from related securitization activities	21,365	11,996	18,787
Purchases	(4,629)	(6,846)	(12,283)
Other changes in loans and leases, net	(31,292)	(41,104)	(31,194)
Other investing activities, net	(1,986)	8,411	408
Net cash used in investing activities	(71,468)	(51,541)	(62,285)
Financing activities			
Net change in:			
Deposits	71,931	48,611	63,675
Federal funds purchased and securities loaned or sold under agreements to repurchase	10,070	7,024	(4,000)
Short-term borrowings	(12,478)	8,538	(4,014)
Long-term debt:			
Proceeds from issuance	64,278	53,486	35,537
Retirement	(53,046)	(49,480)	(51,623)
Preferred stock:			
Proceeds from issuance	4,515	—	2,947
Redemption	(4,512)	—	—
Common stock repurchased	(20,094)	(12,814)	(5,112)
Cash dividends paid	(6,895)	(5,700)	(4,194)
Other financing activities, net	(651)	(397)	(63)
Net cash provided by financing activities	53,118	49,268	33,153
Effect of exchange rate changes on cash and cash equivalents	(1,200)	2,105	240
Net increase (decrease) in cash and cash equivalents	19,970	9,696	(11,615)
Cash and cash equivalents at January 1	157,434	147,738	159,353
Cash and cash equivalents at December 31	$ 177,404	$ 157,434	$ 147,738
Supplemental cash flow disclosures			
Interest paid	$ 19,087	$ 12,852	$ 10,510
Income taxes paid, net	2,470	3,235	1,043

See accompanying Notes to Consolidated Financial Statements.

Bank of America Corporation and Subsidiaries
Notes to Consolidated Financial Statements

NOTE 1 Summary of Significant Accounting Principles

Bank of America Corporation, a bank holding company and a financial holding company, provides a diverse range of financial services and products throughout the U.S. and in certain international markets. The term “the Corporation” as used herein may refer to Bank of America Corporation, individually, Bank of America Corporation and its subsidiaries, or certain of Bank of America Corporation’s subsidiaries or affiliates.

Principles of Consolidation and Basis of Presentation

The Consolidated Financial Statements include the accounts of the Corporation and its majority-owned subsidiaries and those variable interest entities (VIEs) where the Corporation is the primary beneficiary. Intercompany accounts and transactions have been eliminated. Results of operations of acquired companies are included from the dates of acquisition and for VIEs, from the dates that the Corporation became the primary beneficiary. Assets held in an agency or fiduciary capacity are not included in the Consolidated Financial Statements. The Corporation accounts for investments in companies for which it owns a voting interest and for which it has the ability to exercise significant influence over operating and financing decisions using the equity method of accounting. These investments are included in other assets. Equity method investments are subject to impairment testing, and the Corporation’s proportionate share of income or loss is included in other income.

The preparation of the Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States of America (GAAP) requires management to make estimates and assumptions that affect reported amounts and disclosures. Realized results could materially differ from those estimates and assumptions. Certain prior-period amounts have been reclassified to conform to current-period presentation.

New Accounting Standards

Effective January 1, 2018, the Corporation adopted the following new accounting standards on a prospective basis.

- **Revenue Recognition** – The new accounting standard addresses the recognition of revenue from contracts with customers. For additional information, see Revenue Recognition Accounting Policies in this Note, *Note 2 – Noninterest Income* and *Note 23 – Business Segment Information*.
- **Hedge Accounting** – The new accounting standard simplifies and expands the ability to apply hedge accounting to certain risk management activities. For additional information, see *Note 3 – Derivatives*.
- **Recognition and Measurement of Financial Assets and Liabilities** – The new accounting standard relates to the recognition and measurement of financial instruments, including equity investments. For additional information, see *Note 4 – Securities* and *Note 22 – Fair Value of Financial Instruments.*
- **Tax Effects in Accumulated Other Comprehensive Income** – The new accounting standard addresses certain tax effects stranded in accumulated other comprehensive income (OCI) related to the 2017 Tax Cuts and Job Act (the Tax Act). For additional information, see *Note 14 – Accumulated Other Comprehensive Income (Loss)*.

Effective January 1, 2018, the Corporation adopted the following new accounting standards on a retrospective basis, resulting in restatement of all prior periods presented in the Consolidated Statement of Income and the Consolidated Statement of Cash Flows. The changes in presentation are not material to the individual line items affected.

- **Presentation of Pension Costs** – The new accounting standard requires separate presentation of the service cost component of pension expense from all other components of net pension benefit/cost in the Consolidated Statement of Income. As a result, the service cost component continues to be presented in personnel expense while other components of net pension benefit/cost (e.g., interest cost, actual return on plan assets, amortization of prior service cost) are now presented in other general operating expense. For additional information, see *Note 17 – Employee Benefit Plans.*
- **Classification of Cash Flows and Restricted Cash** – The new accounting standards address the classification of certain cash receipts and cash payments in the statement of cash flows as well as the presentation and disclosure of restricted cash. For more information on restricted cash, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash*.

Lease Accounting

On January 1, 2019, the Corporation adopted the new accounting standards that require lessees to recognize operating leases on the Consolidated Balance Sheet as right-of-use assets and lease liabilities based on the value of the discounted future lease payments. Lessor accounting is largely unchanged. Expanded disclosures about the nature and terms of lease agreements will be required prospectively. The Corporation elected to apply certain transition elections which allow for the continued application of the previous determination of whether a contract that existed at transition is or contains a lease, the associated lease classification, and the recognition of leases on January 1, 2019 through a cumulative-effect adjustment to retained earnings, with no adjustment to comparative prior periods presented. Upon adoption, the Corporation recognized right-of-use assets and lease liabilities of $9.7 billion. Adoption of the standard did not have a significant effect on the Corporation’s regulatory capital measures.

Accounting Standards Issued and Not Yet Adopted

Accounting for Financial Instruments – Credit Losses

The Financial Accounting Standards Board issued a new accounting standard that will be effective for the Corporation on January 1, 2020. The standard replaces the existing measurement of the allowance for credit losses that is based on management’s best estimate of probable credit losses inherent in the Corporation’s lending activities with management’s best estimate of lifetime expected credit losses inherent in the Corporation’s financial assets that are recognized at amortized cost. The standard will also expand credit quality disclosures. While the standard changes the measurement of the allowance for credit losses, it does not change the Corporation’s credit risk of its lending portfolios. The credit loss estimation models and processes to be used in implementing the new standard have largely been designed and developed. The validation of the models and testing of controls are in process and expected to be completed during 2019. Currently, the impact of this new accounting standard may be an increase in the Corporation’s allowance for credit losses at the date of adoption which would have a resulting negative adjustment to retained earnings. The ultimate impact will be dependent on the characteristics of the

Corporation's portfolio at adoption date as well as the macroeconomic conditions and forecasts as of that date.

Significant Accounting Principles

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, cash items in the process of collection, cash segregated under federal and other brokerage regulations, and amounts due from correspondent banks, the Federal Reserve Bank and certain non-U.S. central banks. Certain cash balances are restricted as to withdrawal or usage by legal binding contractual agreements or regulatory requirements.

Securities Financing Agreements

Securities borrowed or purchased under agreements to resell and securities loaned or sold under agreements to repurchase (securities financing agreements) are treated as collateralized financing transactions except in instances where the transaction is required to be accounted for as individual sale and purchase transactions. Generally, these agreements are recorded at acquisition or sale price plus accrued interest, except for certain securities financing agreements that the Corporation accounts for under the fair value option. Changes in the fair value of securities financing agreements that are accounted for under the fair value option are recorded in trading account profits in the Consolidated Statement of Income.

The Corporation's policy is to monitor the market value of the principal amount loaned under resale agreements and obtain collateral from or return collateral pledged to counterparties when appropriate. Securities financing agreements do not create material credit risk due to these collateral provisions; therefore, an allowance for loan losses is not necessary.

In transactions where the Corporation acts as the lender in a securities lending agreement and receives securities that can be pledged or sold as collateral, it recognizes an asset on the Consolidated Balance Sheet at fair value, representing the securities received, and a liability, representing the obligation to return those securities.

Collateral

The Corporation accepts securities and loans as collateral that it is permitted by contract or practice to sell or repledge. At December 31, 2018 and 2017, the fair value of this collateral was $599.0 billion and $561.9 billion, of which $508.6 billion and $476.1 billion were sold or repledged. The primary source of this collateral is securities borrowed or purchased under agreements to resell.

The Corporation also pledges company-owned securities and loans as collateral in transactions that include repurchase agreements, securities loaned, public and trust deposits, U.S. Treasury tax and loan notes, and short-term borrowings. This collateral, which in some cases can be sold or repledged by the counterparties to the transactions, is parenthetically disclosed on the Consolidated Balance Sheet.

In certain cases, the Corporation has transferred assets to consolidated VIEs where those restricted assets serve as collateral for the interests issued by the VIEs. These assets are included on the Consolidated Balance Sheet in Assets of Consolidated VIEs.

In addition, the Corporation obtains collateral in connection with its derivative contracts. Required collateral levels vary depending on the credit risk rating and the type of counterparty. Generally, the Corporation accepts collateral in the form of cash, U.S. Treasury securities and other marketable securities. Based on provisions contained in master netting agreements, the Corporation nets cash collateral received against derivative assets. The Corporation also pledges collateral on its own derivative positions which can be applied against derivative liabilities.

Trading Instruments

Financial instruments utilized in trading activities are carried at fair value. Fair value is generally based on quoted market prices for the same or similar assets and liabilities. If these market prices are not available, fair values are estimated based on dealer quotes, pricing models, discounted cash flow methodologies, or similar techniques where the determination of fair value may require significant management judgment or estimation. Realized gains and losses are recorded on a trade-date basis. Realized and unrealized gains and losses are recognized in trading account profits.

Derivatives and Hedging Activities

Derivatives are entered into on behalf of customers, for trading or to support risk management activities. Derivatives used in risk management activities include derivatives that are both designated in qualifying accounting hedge relationships and derivatives used to hedge market risks in relationships that are not designated in qualifying accounting hedge relationships (referred to as other risk management activities). The Corporation manages interest rate and foreign currency exchange rate sensitivity predominantly through the use of derivatives. Derivatives utilized by the Corporation include swaps, futures and forward settlement contracts, and option contracts.

All derivatives are recorded on the Consolidated Balance Sheet at fair value, taking into consideration the effects of legally enforceable master netting agreements that allow the Corporation to settle positive and negative positions and offset cash collateral held with the same counterparty on a net basis. For exchange-traded contracts, fair value is based on quoted market prices in active or inactive markets or is derived from observable market-based pricing parameters, similar to those applied to over-the-counter (OTC) derivatives. For non-exchange traded contracts, fair value is based on dealer quotes, pricing models, discounted cash flow methodologies or similar techniques for which the determination of fair value may require significant management judgment or estimation.

Valuations of derivative assets and liabilities reflect the value of the instrument including counterparty credit risk. These values also take into account the Corporation's own credit standing.

Trading Derivatives and Other Risk Management Activities

Derivatives held for trading purposes are included in derivative assets or derivative liabilities on the Consolidated Balance Sheet with changes in fair value included in trading account profits.

Derivatives used for other risk management activities are included in derivative assets or derivative liabilities. Derivatives used in other risk management activities have not been designated in qualifying accounting hedge relationships because they did not qualify or the risk that is being mitigated pertains to an item that is reported at fair value through earnings so that the effect of measuring the derivative instrument and the asset or liability to which the risk exposure pertains will offset in the Consolidated Statement of Income to the extent effective. The changes in the fair value of derivatives that serve to mitigate certain risks associated with mortgage servicing rights (MSRs), interest rate lock commitments (IRLCs) and first-lien mortgage loans held-for-sale (LHFS) that are originated by the Corporation are recorded in other income. Changes in the fair value of derivatives that serve to mitigate interest rate risk and foreign currency risk are included in other income. Credit derivatives are also used by the Corporation to mitigate the risk associated with various credit exposures. The changes in the fair value of these derivatives are included in other income.

Derivatives Used For Hedge Accounting Purposes (Accounting Hedges)

For accounting hedges, the Corporation formally documents at inception all relationships between hedging instruments and hedged items, as well as the risk management objectives and strategies for undertaking various accounting hedges. Additionally, the Corporation primarily uses regression analysis at the inception of a hedge and for each reporting period thereafter to assess whether the derivative used in an accounting hedge transaction is expected to be and has been highly effective in offsetting changes in the fair value or cash flows of a hedged item or forecasted transaction. The Corporation discontinues hedge accounting when it is determined that a derivative is not expected to be or has ceased to be highly effective as a hedge, and then reflects changes in fair value of the derivative in earnings after termination of the hedge relationship.

Fair value hedges are used to protect against changes in the fair value of the Corporation's assets and liabilities that are attributable to interest rate or foreign exchange volatility. Changes in the fair value of derivatives designated as fair value hedges are recorded in earnings, together and in the same income statement line item with changes in the fair value of the related hedged item. If a derivative instrument in a fair value hedge is terminated or the hedge designation removed, the previous adjustments to the carrying value of the hedged asset or liability are subsequently accounted for in the same manner as other components of the carrying value of that asset or liability. For interest-earning assets and interest-bearing liabilities, such adjustments are amortized to earnings over the remaining life of the respective asset or liability.

Cash flow hedges are used primarily to minimize the variability in cash flows of assets and liabilities or forecasted transactions caused by interest rate or foreign exchange rate fluctuations. Changes in the fair value of derivatives used in cash flow hedges are recorded in accumulated OCI and are reclassified into the line item in the income statement in which the hedged item is recorded in the same period the hedged item affects earnings. Components of a derivative that are excluded in assessing hedge effectiveness are recorded in the same income statement line item as the hedged item.

Net investment hedges are used to manage the foreign exchange rate sensitivity arising from a net investment in a foreign operation. Changes in the spot prices of derivatives that are designated as net investment hedges of foreign operations are recorded as a component of accumulated OCI. The remaining components of these derivatives are excluded in assessing hedge effectiveness and are recorded in other income.

Securities

Debt securities are reported on the Consolidated Balance Sheet at their trade date. Their classification is dependent on the purpose for which the securities were acquired. Debt securities purchased for use in the Corporation's trading activities are reported in trading account assets at fair value with unrealized gains and losses included in trading account profits. Substantially all other debt securities purchased are used in the Corporation's asset and liability management (ALM) activities and are reported on the Consolidated Balance Sheet as either debt securities carried at fair value or as held-to-maturity (HTM) debt securities. Debt securities carried at fair value are either available-for-sale (AFS) securities with unrealized gains and losses net-of-tax included in accumulated OCI or carried at fair value with unrealized gains and losses reported in other income. HTM debt securities, which are certain debt securities that management has the intent and ability to hold to maturity, are reported at amortized cost.

The Corporation regularly evaluates each AFS and HTM debt security where the value has declined below amortized cost to assess whether the decline in fair value is other than temporary. In determining whether an impairment is other than temporary, the Corporation considers the severity and duration of the decline in fair value, the length of time expected for recovery, the financial condition of the issuer, and other qualitative factors, as well as whether the Corporation either plans to sell the security or it is more likely than not that it will be required to sell the security before recovery of the amortized cost. For AFS debt securities the Corporation intends to hold, an analysis is performed to determine how much of the decline in fair value is related to the issuer's credit and how much is related to market factors (e.g., interest rates). If any of the decline in fair value is due to credit, an other-than-temporary impairment (OTTI) loss is recognized in the Consolidated Statement of Income for that amount. If any of the decline in fair value is related to market factors, that amount is recognized in accumulated OCI. In certain instances, the credit loss may exceed the total decline in fair value, in which case, the difference is due to market factors and is recognized as an unrealized gain in accumulated OCI. If the Corporation intends to sell or believes it is more likely than not that it will be required to sell the debt security, it is written down to fair value as an OTTI loss.

Interest on debt securities, including amortization of premiums and accretion of discounts, is included in interest income. Premiums and discounts are amortized or accreted to interest income at a constant effective yield over the contractual lives of the securities. Realized gains and losses from the sales of debt securities are determined using the specific identification method.

Equity securities with readily determinable fair values that are not held for trading purposes are carried at fair value with unrealized gains and losses included in other income. Equity securities that do not have readily determinable fair values are held at cost and evaluated for impairment. These securities are reported in other assets or time deposits placed and other short-term investments.

Loans and Leases

Loans, with the exception of loans accounted for under the fair value option, are measured at historical cost and reported at their outstanding principal balances net of any unearned income, charge-offs, unamortized deferred fees and costs on originated loans, and for purchased loans, net of any unamortized premiums or discounts. Loan origination fees and certain direct origination costs are deferred and recognized as adjustments to interest income over the lives of the related loans. Unearned income, discounts and premiums are amortized to interest income using a level yield methodology. The Corporation elects to account for certain consumer and commercial loans under the fair value option with changes in fair value reported in other income.

Under applicable accounting guidance, for reporting purposes, the loan and lease portfolio is categorized by portfolio segment and, within each portfolio segment, by class of financing receivables. A portfolio segment is defined as the level at which an entity develops and documents a systematic methodology to determine the allowance for credit losses, and a class of financing receivables is defined as the level of disaggregation of portfolio segments based on the initial measurement attribute, risk characteristics and methods for assessing risk. The Corporation's three portfolio segments are Consumer Real Estate, Credit Card and Other Consumer, and Commercial. The classes within the Consumer Real Estate portfolio segment are residential mortgage and home equity. The classes within the Credit Card and Other Consumer portfolio segment are U.S. credit card, direct/indirect consumer and other consumer. The classes within the Commercial portfolio segment are U.S. commercial, non-U.S. commercial, commercial real estate, commercial lease financing and U.S. small business commercial.

Purchased Credit-impaired Loans

At acquisition, purchased credit-impaired (PCI) loans are recorded at fair value with no allowance for credit losses, and accounted for individually or aggregated in pools based on similar risk characteristics. The expected cash flows in excess of the amount paid for the loans is referred to as the accretable yield and is recorded as interest income over the remaining estimated life of the loan or pool of loans. The excess of the contractual principal and interest over the expected cash flows of the PCI loans is referred to as the nonaccretable difference. If, upon subsequent valuation, the Corporation determines it is probable that the present value of the expected cash flows has decreased, a charge to the provision for credit losses is recorded. If it is probable that there is a significant increase in the present value of expected cash flows, the allowance for credit losses is reduced or, if there is no remaining allowance for credit losses related to these PCI loans, the accretable yield is increased through a reclassification from nonaccretable difference, resulting in a prospective increase in interest income. Reclassifications to or from nonaccretable difference can also occur for changes in the estimated lives of the PCI loans. If a loan within a PCI pool is sold, foreclosed, forgiven or the expectation of any future proceeds is remote, the loan is removed from the pool at its proportional carrying value. If the loan's recovery value is less than its carrying value, the difference is first applied against the PCI pool's nonaccretable difference and then against the allowance for credit losses.

Leases

The Corporation provides equipment financing to its customers through a variety of lease arrangements. Direct financing leases are carried at the aggregate of lease payments receivable plus estimated residual value of the leased property less unearned income. Leveraged leases, which are a form of financing leases, are reported net of non-recourse debt. Unearned income on leveraged and direct financing leases is accreted to interest income over the lease terms using methods that approximate the interest method.

Allowance for Credit Losses

The allowance for credit losses, which includes the allowance for loan and lease losses and the reserve for unfunded lending commitments, represents management's estimate of probable incurred credit losses in the Corporation's loan and lease portfolio excluding loans and unfunded lending commitments accounted for under the fair value option. The allowance for credit losses includes both quantitative and qualitative components. The qualitative component has a higher degree of management subjectivity, and includes factors such as concentrations, economic conditions and other considerations. The allowance for loan and lease losses represents the estimated probable credit losses on funded consumer and commercial loans and leases while the reserve for unfunded lending commitments, including standby letters of credit (SBLCs) and binding unfunded loan commitments, represents estimated probable credit losses on these unfunded credit instruments based on utilization assumptions. Lending-related credit exposures deemed to be uncollectible, excluding loans carried at fair value, are charged off against these accounts.

The Corporation performs periodic and systematic detailed reviews of its lending portfolios to identify credit risks and to assess the overall collectability of those portfolios. The allowance on certain homogeneous consumer loan portfolios, which generally consist of consumer real estate loans within the Consumer Real Estate portfolio segment and credit card loans within the Credit Card and Other Consumer portfolio segment, is based on aggregated portfolio segment evaluations generally by product type. Loss forecast models are utilized for these portfolios which consider a variety of factors including, but not limited to, historical loss experience, estimated defaults or foreclosures based on portfolio trends, delinquencies, bankruptcies, economic conditions, credit scores and the amount of loss in the event of default.

For consumer loans secured by residential real estate, using statistical modeling methodologies, the Corporation estimates the number of loans that will default based on the individual loan attributes aggregated into pools of homogeneous loans with similar attributes. The attributes that are most significant to the probability of default and are used to estimate defaults include refreshed loan-to-value (LTV) or, in the case of a subordinated lien, refreshed combined LTV (CLTV), borrower credit score, months since origination (referred to as vintage) and geography, all of which are further broken down by present collection status (whether the loan is current, delinquent, in default or in bankruptcy). The severity or loss given default is estimated based on the refreshed LTV for first-lien mortgages or CLTV for subordinated liens. The estimates are based on the Corporation's historical experience with the loan portfolio, adjusted to reflect an assessment of environmental factors not yet reflected in the historical data underlying the loss estimates, such as changes in real estate values, local and national economies, underwriting standards and the regulatory environment. The probability of default models also incorporate recent experience with modification programs including re-defaults subsequent to modification, a loan's default history prior to modification and the change in borrower payments post-modification. On home equity loans where the Corporation holds only a second-lien position and foreclosure is not the best alternative, the loss severity is estimated at 100 percent.

The allowance on certain commercial loans (except business card and certain small business loans) is calculated using loss rates delineated by risk rating and product type. Factors considered when assessing loss rates include the value of the underlying collateral, if applicable, the industry of the obligor, and the obligor's liquidity and other financial indicators along with certain qualitative factors. These statistical models are updated regularly for changes in economic and business conditions. Included in the analysis of consumer and commercial loan portfolios are qualitative estimates which are maintained to cover uncertainties that affect the Corporation's estimate of probable losses including domestic and global economic uncertainty and large single-name defaults.

For individually impaired loans, which include nonperforming commercial loans as well as consumer and commercial loans and leases modified in a troubled debt restructuring (TDR), management measures impairment primarily based on the present value of payments expected to be received, discounted at the loans' original effective contractual interest rates. Credit card loans are discounted at the portfolio average contractual annual percentage rate, excluding promotionally priced loans, in effect prior to restructuring. Impaired loans and TDRs may also be measured based on observable market prices, or for loans that are solely dependent on the collateral for repayment, the estimated fair value of the collateral less costs to sell. If the recorded investment in impaired loans exceeds this amount, a specific allowance is established as part of the allowance for loan and lease losses unless these are secured consumer loans that are solely dependent on collateral for repayment, in which case the amount that exceeds the fair value of the collateral is charged off.

Generally, the Corporation initially estimates the fair value of the collateral securing these consumer real estate-secured loans using an automated valuation model (AVM). An AVM is a tool that estimates the value of a property by reference to market data including sales of comparable properties and price trends specific to the Metropolitan Statistical Area in which the property being valued is located. In the event that an AVM value is not available, the Corporation utilizes publicized indices or if these methods provide less reliable valuations, the Corporation uses appraisals or broker price opinions to estimate the fair value of the collateral. While there is inherent imprecision in these valuations, the Corporation believes that they are representative of the portfolio in the aggregate.

In addition to the allowance for loan and lease losses, the Corporation also estimates probable losses related to unfunded lending commitments, such as letters of credit, financial guarantees and binding unfunded loan commitments. Unfunded lending commitments are subject to individual reviews and are analyzed and segregated by risk according to the Corporation's internal risk rating scale. These risk classifications, in conjunction with an analysis of historical loss experience, utilization assumptions, current economic conditions, performance trends within the portfolio and any other pertinent information, result in the estimation of the reserve for unfunded lending commitments.

The allowance for credit losses related to the loan and lease portfolio is reported separately on the Consolidated Balance Sheet whereas the reserve for unfunded lending commitments is reported on the Consolidated Balance Sheet in accrued expenses and other liabilities. The provision for credit losses related to the loan and lease portfolio and unfunded lending commitments is reported in the Consolidated Statement of Income.

Nonperforming Loans and Leases, Charge-offs and Delinquencies

Nonperforming loans and leases generally include loans and leases that have been placed on nonaccrual status. Loans accounted for under the fair value option, PCI loans and LHFS are not reported as nonperforming.

In accordance with the Corporation's policies, consumer real estate-secured loans, including residential mortgages and home equity loans, are generally placed on nonaccrual status and classified as nonperforming at 90 days past due unless repayment of the loan is insured by the Federal Housing Administration (FHA) or through individually insured long-term standby agreements with Fannie Mae (FNMA) or Freddie Mac (FHLMC) (the fully-insured portfolio). Residential mortgage loans in the fully-insured portfolio are not placed on nonaccrual status and, therefore, are not reported as nonperforming. Junior-lien home equity loans are placed on nonaccrual status and classified as nonperforming when the underlying first-lien mortgage loan becomes 90 days past due even if the junior-lien loan is current. The outstanding balance of real estate-secured loans that is in excess of the estimated property value less costs to sell is charged off no later than the end of the month in which the loan becomes 180 days past due unless the loan is fully insured, or for loans in bankruptcy, within 60 days of receipt of notification of filing, with the remaining balance classified as nonperforming.

Consumer loans secured by personal property, credit card loans and other unsecured consumer loans are not placed on nonaccrual status prior to charge-off and, therefore, are not reported as nonperforming loans, except for certain secured consumer loans, including those that have been modified in a TDR. Personal property-secured loans (including auto loans) are charged off to collateral value no later than the end of the month in which the account becomes 120 days past due, or upon repossession of an auto or, for loans in bankruptcy, within 60 days of receipt of notification of filing. Credit card and other unsecured customer loans are charged off no later than the end of the month in which the account becomes 180 days past due, within 60 days after receipt of notification of death or bankruptcy, or upon confirmation of fraud.

Commercial loans and leases, excluding business card loans, that are past due 90 days or more as to principal or interest, or where reasonable doubt exists as to timely collection, including loans that are individually identified as being impaired, are generally placed on nonaccrual status and classified as nonperforming unless well-secured and in the process of collection.

Business card loans are charged off in the same manner as consumer credit card loans. These loans are not placed on nonaccrual status prior to charge-off and, therefore, are not reported as nonperforming loans. Other commercial loans and leases are generally charged off when all or a portion of the principal amount is determined to be uncollectible.

The entire balance of a consumer loan or commercial loan or lease is contractually delinquent if the minimum payment is not received by the specified due date on the customer's billing statement. Interest and fees continue to accrue on past due loans and leases until the date the loan is placed on nonaccrual status, if applicable. Accrued interest receivable is reversed when loans and leases are placed on nonaccrual status. Interest collections on nonaccruing loans and leases for which the ultimate collectability of principal is uncertain are applied as principal reductions; otherwise, such collections are credited to income when received. Loans and leases may be restored to accrual status when all principal and interest is current and full repayment of the remaining contractual principal and interest is expected.

PCI loans are recorded at fair value at the acquisition date. Although the PCI loans may be contractually delinquent, the Corporation does not classify these loans as nonperforming as the loans were written down to fair value at the acquisition date and the accretable yield is recognized in interest income over the remaining life of the loan. In addition, reported net charge-offs exclude write-offs on PCI loans as the fair value already considers the estimated credit losses.

Troubled Debt Restructurings

Consumer and commercial loans and leases whose contractual terms have been restructured in a manner that grants a concession to a borrower experiencing financial difficulties are classified as TDRs. Concessions could include a reduction in the interest rate to a rate that is below market on the loan, payment extensions, forgiveness of principal, forbearance or other actions designed to maximize collections. Loans that are carried at fair value, LHFS and PCI loans are not classified as TDRs.

Loans and leases whose contractual terms have been modified in a TDR and are current at the time of restructuring may remain on accrual status if there is demonstrated performance prior to the restructuring and payment in full under the restructured terms is expected. Otherwise, the loans are placed on nonaccrual status and reported as nonperforming, except for fully-insured consumer real estate loans, until there is sustained repayment performance for a reasonable period, generally six months. If accruing TDRs cease to perform in accordance with their modified contractual terms, they are placed on nonaccrual status and reported as nonperforming TDRs.

Secured consumer loans that have been discharged in Chapter 7 bankruptcy and have not been reaffirmed by the borrower are classified as TDRs at the time of discharge. Such loans are placed on nonaccrual status and written down to the estimated collateral value less costs to sell no later than at the time of discharge. If these loans are contractually current, interest collections are generally recorded in interest income on a cash basis. Consumer real estate-secured loans for which a binding offer to restructure has been extended are also classified as TDRs. Credit card and other unsecured consumer loans that have been renegotiated in a TDR generally remain on accrual status until the loan is either paid in full or charged off, which occurs no later than the end of the month in which the loan becomes 180 days past due or, for loans that have been placed on a fixed payment plan, 120 days past due.

A loan that had previously been modified in a TDR and is subsequently refinanced under current underwriting standards at a market rate with no concessionary terms is accounted for as a new loan and is no longer reported as a TDR.

Loans Held-for-sale

Loans that are intended to be sold in the foreseeable future, including residential mortgages, loan syndications, and to a lesser degree, commercial real estate, consumer finance and other loans, are reported as LHFS and are carried at the lower of aggregate cost or fair value. The Corporation accounts for certain LHFS, including residential mortgage LHFS, under the fair value option. Loan origination costs related to LHFS that the Corporation accounts for under the fair value option are recognized in noninterest expense when incurred. Loan origination costs for LHFS carried at the lower of cost or fair value are capitalized as part of the carrying value of the loans and recognized as a reduction of noninterest income upon the sale of such loans. LHFS that are on nonaccrual status and are reported as nonperforming, as defined in the policy herein, are reported separately from nonperforming loans and leases.

Premises and Equipment

Premises and equipment are carried at cost less accumulated depreciation and amortization. Depreciation and amortization are recognized using the straight-line method over the estimated useful lives of the assets. Estimated lives range up to 40 years for buildings, up to 12 years for furniture and equipment, and the shorter of lease term or estimated useful life for leasehold improvements.

Goodwill and Intangible Assets

Goodwill is the purchase premium after adjusting for the fair value of net assets acquired. Goodwill is not amortized but is reviewed for potential impairment on an annual basis, or when events or circumstances indicate a potential impairment, at the reporting unit level. A reporting unit is a business segment or one level below a business segment.

The Corporation assesses the fair value of each reporting unit against its carrying value, including goodwill, as measured by allocated equity. For purposes of goodwill impairment testing, the Corporation utilizes allocated equity as a proxy for the carrying value of its reporting units. Allocated equity in the reporting units is comprised of allocated capital plus capital for the portion of goodwill and intangibles specifically assigned to the reporting unit.

In performing its goodwill impairment testing, the Corporation first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value. Qualitative factors include, among other things, macroeconomic conditions, industry and market considerations, financial performance of the respective reporting unit and other relevant entity- and reporting-unit specific considerations.

If the Corporation concludes it is more likely than not that the fair value of a reporting unit is less than its carrying value, a quantitative assessment is performed. If the fair value of the reporting unit exceeds its carrying value, goodwill of the reporting unit is considered not impaired; however, if the carrying value of the reporting unit exceeds its fair value, an additional step is performed to measure potential impairment.

This step involves calculating an implied fair value of goodwill which is the excess of the fair value of the reporting unit, as determined in the first step, over the aggregate fair values of the assets, liabilities and identifiable intangibles as if the reporting unit was being acquired in a business combination. If the implied fair value of goodwill exceeds the goodwill assigned to the reporting unit, there is no impairment. If the goodwill assigned to a reporting unit exceeds the implied fair value of goodwill, an impairment charge is recorded for the excess. An impairment loss recognized cannot exceed the amount of goodwill assigned to a reporting unit. An impairment loss establishes a new basis in the goodwill, and subsequent reversals of goodwill impairment losses are not permitted under applicable accounting guidance.

For intangible assets subject to amortization, an impairment loss is recognized if the carrying value of the intangible asset is not recoverable and exceeds fair value. The carrying value of the intangible asset is considered not recoverable if it exceeds the sum of the undiscounted cash flows expected to result from the use of the asset. Intangible assets deemed to have indefinite useful lives are not subject to amortization. An impairment loss is recognized if the carrying value of the intangible asset with an indefinite life exceeds its fair value.

Variable Interest Entities

A VIE is an entity that lacks equity investors or whose equity investors do not have a controlling financial interest in the entity through their equity investments. The Corporation consolidates a VIE if it has both the power to direct the activities of the VIE that most significantly impact the VIE's economic performance and an obligation to absorb losses or the right to receive benefits that could potentially be significant to the VIE. On a quarterly basis, the Corporation reassesses its involvement with the VIE and evaluates the impact of changes in governing documents and its financial interests in the VIE. The consolidation status of the VIEs with which the Corporation is involved may change as a result of such reassessments.

The Corporation primarily uses VIEs for its securitization activities, in which the Corporation transfers whole loans or debt securities into a trust or other vehicle. When the Corporation is the servicer of whole loans held in a securitization trust, including non-agency residential mortgages, home equity loans, credit cards, and other loans, the Corporation has the power to direct the most significant activities of the trust. The Corporation generally does not have the power to direct the most significant activities of a residential mortgage agency trust except in certain circumstances in which the Corporation holds substantially all of the issued securities and has the unilateral right to liquidate the trust. The power to direct the most significant activities of a commercial mortgage securitization trust is typically held by the special servicer or by the party holding specific subordinate securities which embody certain controlling rights. The Corporation consolidates a whole-loan securitization trust if it has the power to direct the most significant activities and also holds securities issued by the trust or has other contractual arrangements, other than standard representations and warranties, that could potentially be significant to the trust.

The Corporation may also transfer trading account securities and AFS securities into municipal bond or resecuritization trusts. The Corporation consolidates a municipal bond or resecuritization trust if it has control over the ongoing activities of the trust such as the remarketing of the trust's liabilities or, if there are no ongoing activities, sole discretion over the design of the trust, including the identification of securities to be transferred in and the structure of securities to be issued, and also retains securities or has liquidity or other commitments that could potentially be significant to the trust. The Corporation does not consolidate a municipal bond or resecuritization trust if one or a limited number of third-party investors share responsibility for the design of the trust or have control over the significant activities of the trust through liquidation or other substantive rights.

Other VIEs used by the Corporation include collateralized debt obligations (CDOs), investment vehicles created on behalf of customers and other investment vehicles. The Corporation does not routinely serve as collateral manager for CDOs and, therefore, does not typically have the power to direct the activities that most significantly impact the economic performance of a CDO. However, following an event of default, if the Corporation is a majority holder of senior securities issued by a CDO and acquires the power to manage its assets, the Corporation consolidates the CDO.

The Corporation consolidates a customer or other investment vehicle if it has control over the initial design of the vehicle or manages the assets in the vehicle and also absorbs potentially significant gains or losses through an investment in the vehicle, derivative contracts or other arrangements. The Corporation does not consolidate an investment vehicle if a single investor controlled the initial design of the vehicle or manages the assets in the vehicles or if the Corporation does not have a variable interest that could potentially be significant to the vehicle.

Retained interests in securitized assets are initially recorded at fair value. In addition, the Corporation may invest in debt securities issued by unconsolidated VIEs. Fair values of these debt securities, which are classified as trading account assets, debt securities carried at fair value or HTM securities, are based primarily on quoted market prices in active or inactive markets. Generally, quoted market prices for retained residual interests are not available; therefore, the Corporation estimates fair values based on the present value of the associated expected future cash flows.

Fair Value

The Corporation measures the fair values of its assets and liabilities, where applicable, in accordance with accounting guidance that requires an entity to base fair value on exit price. Under this guidance, an entity is required to maximize the use of observable inputs and minimize the use of unobservable inputs in measuring fair value. A hierarchy is established which categorizes fair value measurements into three levels based on the inputs to the valuation technique with the highest priority given to unadjusted quoted prices in active markets and the lowest priority given to unobservable inputs. The Corporation categorizes its fair value measurements of financial instruments based on this three-level hierarchy.

Level 1 Unadjusted quoted prices in active markets for identical assets or liabilities. Level 1 assets and liabilities include debt and equity securities and derivative contracts that are traded in an active exchange market, as well as certain U.S. Treasury securities that are highly liquid and are actively traded in OTC markets.

Level 2 Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 2 assets and liabilities include debt securities with quoted prices that are traded less frequently than exchange-traded instruments and derivative contracts where fair value is determined using a pricing model with inputs that are observable in the market or can be derived principally from or corroborated by observable market data. This category generally includes U.S. government and agency mortgage-backed (MBS) and asset-backed securities (ABS), corporate debt securities, derivative contracts, certain loans and LHFS.

Level 3 Unobservable inputs that are supported by little or no market activity and that are significant to the overall fair value of the assets or liabilities. Level 3 assets and liabilities include financial instruments for which the determination of fair value requires significant management judgment or estimation. The fair value for such assets and liabilities is generally determined using pricing models, discounted cash flow methodologies or similar techniques that incorporate the assumptions a market participant would use in pricing the asset or liability. This category generally includes retained residual interests in securitizations, consumer MSRs, certain ABS, highly structured, complex or long-dated derivative contracts, certain loans and LHFS, IRLCs and certain CDOs where independent pricing information cannot be obtained for a significant portion of the underlying assets.

Income Taxes

There are two components of income tax expense: current and deferred. Current income tax expense reflects taxes to be paid or refunded for the current period. Deferred income tax expense results from changes in deferred tax assets and liabilities between periods. These gross deferred tax assets and liabilities represent decreases or increases in taxes expected to be paid in the future because of future reversals of temporary differences in the bases of assets and liabilities as measured by tax laws and their bases as reported in the financial statements. Deferred tax assets are also recognized for tax attributes such as net operating loss carryforwards and tax credit carryforwards. Valuation allowances are recorded to reduce deferred tax assets to the amounts management concludes are more likely than not to be realized.

Income tax benefits are recognized and measured based upon a two-step model: first, a tax position must be more likely than not to be sustained based solely on its technical merits in order to be recognized, and second, the benefit is measured as the largest dollar amount of that position that is more likely than not to be sustained upon settlement. The difference between the benefit recognized and the tax benefit claimed on a tax return is referred to as an unrecognized tax benefit. The Corporation records income tax-related interest and penalties, if applicable, within income tax expense.

Revenue Recognition

The following summarizes the Corporation's revenue recognition accounting policies for certain noninterest income activities.

Card Income

Card income includes annual, late and over-limit fees as well as fees earned from interchange, cash advances and other miscellaneous transactions and is presented net of direct costs. Interchange fees are recognized upon settlement of the credit and debit card payment transactions and are generally determined on a percentage basis for credit cards and fixed rates for debit cards based on the corresponding payment network's rates. Substantially all card fees are recognized at the transaction date, except for certain time-based fees such as annual fees, which are recognized over 12 months. Fees charged to cardholders that are estimated to be uncollectible are reserved in the allowance for loan and lease losses. Included in direct cost are rewards and credit card partner payments. Rewards paid to cardholders are related to points earned by the cardholder that can be redeemed for a broad range of rewards including cash, travel and gift cards. The points to be redeemed are estimated based on past redemption behavior, card product type, account transaction activity and other historical card performance. The liability is reduced as the points are redeemed. The Corporation also makes payments to credit card partners. The payments are based on revenue-sharing agreements that are generally driven by cardholder transactions and partner sales volumes. As part of the revenue-sharing agreements, the credit card partner provides the Corporation exclusive rights to market to the credit card partner's members or customers on behalf of the Corporation.

Service Charges

Service charges include deposit and lending-related fees. Deposit-related fees consist of fees earned on consumer and commercial deposit activities and are generally recognized when the transactions occur or as the service is performed. Consumer fees are earned on consumer deposit accounts for account maintenance and various transaction-based services, such as ATM transactions, wire transfer activities, check and money order processing and insufficient funds/overdraft transactions. Commercial deposit-related fees are from the Corporation's Global Transaction Services business and consist of commercial deposit and treasury management services, including account maintenance and other services, such as payroll, sweep account and other cash management services. Lending-related fees generally represent transactional fees earned from certain loan commitments, financial guarantees and SBLCs.

Investment and Brokerage Services

Investment and brokerage services consist of asset management and brokerage fees. Asset management fees are earned from the management of client assets under advisory agreements or the full discretion of the Corporation's financial advisors (collectively referred to as assets under management (AUM)). Asset management fees are earned as a percentage of the client's AUM and generally range from 50 basis points (bps) to 150 bps of the AUM. In cases where a third party is used to obtain a client's investment allocation, the fee remitted to the third party is recorded net and is not reflected in the transaction price, as the Corporation is an agent for those services.

Brokerage fees include income earned from transaction-based services that are performed as part of investment management services and are based on a fixed price per unit or as a percentage of the total transaction amount. Brokerage fees also include distribution fees and sales commissions that are primarily in the *Global Wealth & Investment Management* (*GWIM*) segment and are earned over time. In addition, primarily in the *Global Markets* segment, brokerage fees are earned when the Corporation fills customer orders to buy or sell various financial products or when it acknowledges, affirms, settles and clears transactions and/or submits trade information to the appropriate clearing broker. Certain customers pay brokerage, clearing and/or exchange fees imposed by relevant regulatory bodies or exchanges in order to execute or clear trades. These fees are recorded net and are not reflected in the transaction price, as the Corporation is an agent for those services.

Investment Banking Income

Investment banking income includes underwriting income and financial advisory services income. Underwriting consists of fees earned for the placement of a customer's debt or equity securities. The revenue is generally earned based on a percentage of the fixed number of shares or principal placed. Once the number of shares or notes is determined and the service is completed, the underwriting fees are recognized. The Corporation incurs certain out-of-pocket expenses, such as legal costs, in performing these services. These expenses are recovered through the revenue the Corporation earns from the customer and are included in operating expenses. Syndication fees represent fees earned as the agent or lead lender responsible for structuring, arranging and administering a loan syndication.

Financial advisory services consist of fees earned for assisting customers with transactions related to mergers and acquisitions and financial restructurings. Revenue varies depending on the size and number of services performed for each contract and is generally contingent on successful execution of the transaction. Revenue is typically recognized once the transaction is completed and all services have been rendered. Additionally, the Corporation may earn a fixed fee in merger and acquisition transactions to provide a fairness opinion, with the fees recognized when the opinion is delivered to the customer.

Other Revenue Measurement and Recognition Policies

The Corporation did not disclose the value of any open performance obligations at December 31, 2018, as its contracts with customers generally have a fixed term that is less than one year, an open term with a cancellation period that is less than one year, or provisions that allow the Corporation to recognize revenue at the amount it has the right to invoice.

Earnings Per Common Share

Earnings per common share (EPS) is computed by dividing net income allocated to common shareholders by the weighted-average common shares outstanding, excluding unvested common shares subject to repurchase or cancellation. Net income allocated to common shareholders is net income adjusted for preferred stock dividends including dividends declared, accretion of discounts on preferred stock including accelerated accretion when preferred stock is repaid early, and cumulative dividends related to the current dividend period that have not been declared as of period end, less income allocated to participating securities. Diluted EPS is computed by dividing income allocated to common shareholders plus dividends on dilutive convertible preferred stock and preferred stock that can be tendered to exercise warrants, by the weighted-average common shares outstanding plus amounts representing the dilutive effect of stock options outstanding, restricted stock, restricted stock units (RSUs), outstanding warrants and the dilution resulting from the conversion of convertible preferred stock, if applicable.

Foreign Currency Translation

Assets, liabilities and operations of foreign branches and subsidiaries are recorded based on the functional currency of each entity. When the functional currency of a foreign operation is the local currency, the assets, liabilities and operations are translated, for consolidation purposes, from the local currency to the U.S. dollar reporting currency at period-end rates for assets and liabilities and generally at average rates for results of operations. The resulting unrealized gains and losses are reported as a component of accumulated OCI, net-of-tax. When the foreign entity's functional currency is the U.S. dollar, the resulting remeasurement gains or losses on foreign currency-denominated assets or liabilities are included in earnings.

NOTE 2 Noninterest Income

The table below presents the Corporation's noninterest income disaggregated by revenue source for 2018, 2017 and 2016. For more information, see *Note 1 – Summary of Significant Accounting Principles.* For a disaggregation of noninterest income by business segment and *All Other*, see *Note 23 – Business Segment Information*.

(Dollars in millions)	2018	2017	2016
Card income			
Interchange fees [(1)]	$ 4,093	$ 3,942	$ 3,960
Other card income	1,958	1,960	1,891
Total card income	6,051	5,902	5,851
Service charges			
Deposit-related fees	6,667	6,708	6,545
Lending-related fees	1,100	1,110	1,093
Total service charges	7,767	7,818	7,638
Investment and brokerage services			
Asset management fees	10,189	9,310	8,328
Brokerage fees	3,971	4,526	5,021
Total investment and brokerage services	14,160	13,836	13,349
Investment banking income			
Underwriting income	2,722	2,821	2,585
Syndication fees	1,347	1,499	1,388
Financial advisory services	1,258	1,691	1,268
Total investment banking income	5,327	6,011	5,241
Trading account profits	8,540	7,277	6,902
Other income	1,970	1,841	3,624
Total noninterest income	$ 43,815	$ 42,685	$ 42,605

(1) During 2018, 2017 and 2016, gross interchange fees were $9.5 billion, $8.8 billion and $8.2 billion and are presented net of $5.4 billion, $4.8 billion and $4.2 billion, respectively, of expenses for rewards and partner payments.

NOTE 3 Derivatives

Derivative Balances

Derivatives are entered into on behalf of customers, for trading or to support risk management activities. Derivatives used in risk management activities include derivatives that may or may not be designated in qualifying hedge accounting relationships. Derivatives that are not designated in qualifying hedge accounting relationships are referred to as other risk management derivatives. For more information on the Corporation's derivatives and hedging activities, see *Note 1 – Summary of Significant Accounting Principles.* The following tables present derivative instruments included on the Consolidated Balance Sheet in derivative assets and liabilities at December 31, 2018 and 2017. Balances are presented on a gross basis, prior to the application of counterparty and cash collateral netting. Total derivative assets and liabilities are adjusted on an aggregate basis to take into consideration the effects of legally enforceable master netting agreements and have been reduced by cash collateral received or paid.

		December 31, 2018					
		Gross Derivative Assets			Gross Derivative Liabilities		
(Dollars in billions)	Contract/ Notional [1]	Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total	Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total
Interest rate contracts							
Swaps	$ 15,977.9	$ 141.0	$ 3.2	$ 144.2	$ 138.9	$ 2.0	$ 140.9
Futures and forwards	3,656.6	4.7	—	4.7	5.0	—	5.0
Written options	1,584.9	—	—	—	28.6	—	28.6
Purchased options	1,614.0	30.8	—	30.8	—	—	—
Foreign exchange contracts							
Swaps	1,704.8	38.8	1.4	40.2	42.2	2.3	44.5
Spot, futures and forwards	4,276.0	39.8	0.4	40.2	39.3	0.3	39.6
Written options	256.7	—	—	—	5.0	—	5.0
Purchased options	240.4	4.6	—	4.6	—	—	—
Equity contracts							
Swaps	253.6	7.7	—	7.7	8.4	—	8.4
Futures and forwards	100.0	2.1	—	2.1	0.3	—	0.3
Written options	597.1	—	—	—	27.5	—	27.5
Purchased options	549.4	36.0	—	36.0	—	—	—
Commodity contracts							
Swaps	43.1	2.7	—	2.7	4.5	—	4.5
Futures and forwards	51.7	3.2	—	3.2	0.5	—	0.5
Written options	27.5	—	—	—	2.2	—	2.2
Purchased options	23.4	1.7	—	1.7	—	—	—
Credit derivatives [2, 3]							
Purchased credit derivatives:							
Credit default swaps	408.1	5.3	—	5.3	4.9	—	4.9
Total return swaps/options	84.5	0.4	—	0.4	1.0	—	1.0
Written credit derivatives:							
Credit default swaps	371.9	4.4	—	4.4	4.3	—	4.3
Total return swaps/options	87.3	0.6	—	0.6	0.6	—	0.6
Gross derivative assets/liabilities		$ 323.8	$ 5.0	$ 328.8	$ 313.2	$ 4.6	$ 317.8
Less: Legally enforceable master netting agreements				(252.7)			(252.7)
Less: Cash collateral received/paid				(32.4)			(27.2)
Total derivative assets/liabilities				$ 43.7			$ 37.9

(1) Represents the total contract/notional amount of derivative assets and liabilities outstanding.
(2) The net derivative liability and notional amount of written credit derivatives for which the Corporation held purchased credit derivatives with identical underlying referenced names were $185 million and $342.8 billion at December 31, 2018.
(3) Derivative assets and liabilities for credit default swaps (CDS) reflect a central clearing counterparty's amendments to legally re-characterize daily cash variation margin from collateral, which secures an outstanding exposure, to settlement, which discharges an outstanding exposure, effective in 2018.

(Dollars in billions)	Contract/ Notional [1]	December 31, 2017					
		Gross Derivative Assets			Gross Derivative Liabilities		
		Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total	Trading and Other Risk Management Derivatives	Qualifying Accounting Hedges	Total
Interest rate contracts							
Swaps	$ 15,416.4	$ 175.1	$ 2.9	$ 178.0	$ 172.5	$ 1.7	$ 174.2
Futures and forwards	4,332.4	0.5	—	0.5	0.5	—	0.5
Written options	1,170.5	—	—	—	35.5	—	35.5
Purchased options	1,184.5	37.6	—	37.6	—	—	—
Foreign exchange contracts							
Swaps	2,011.1	35.6	2.2	37.8	36.1	2.7	38.8
Spot, futures and forwards	3,543.3	39.1	0.7	39.8	39.1	0.8	39.9
Written options	291.8	—	—	—	5.1	—	5.1
Purchased options	271.9	4.6	—	4.6	—	—	—
Equity contracts							
Swaps	265.6	4.8	—	4.8	4.4	—	4.4
Futures and forwards	106.9	1.5	—	1.5	0.9	—	0.9
Written options	480.8	—	—	—	23.9	—	23.9
Purchased options	428.2	24.7	—	24.7	—	—	—
Commodity contracts							
Swaps	46.1	1.8	—	1.8	4.6	—	4.6
Futures and forwards	47.1	3.5	—	3.5	0.6	—	0.6
Written options	21.7	—	—	—	1.4	—	1.4
Purchased options	22.9	1.4	—	1.4	—	—	—
Credit derivatives [2]							
Purchased credit derivatives:							
Credit default swaps	470.9	4.1	—	4.1	11.1	—	11.1
Total return swaps/options	54.1	0.1	—	0.1	1.3	—	1.3
Written credit derivatives:							
Credit default swaps	448.2	10.6	—	10.6	3.6	—	3.6
Total return swaps/options	55.2	0.8	—	0.8	0.2	—	0.2
Gross derivative assets/liabilities		$ 345.8	$ 5.8	$ 351.6	$ 340.8	$ 5.2	$ 346.0
Less: Legally enforceable master netting agreements				(279.2)			(279.2)
Less: Cash collateral received/paid				(34.6)			(32.5)
Total derivative assets/liabilities				$ 37.8			$ 34.3

(1) Represents the total contract/notional amount of derivative assets and liabilities outstanding.

(2) The net derivative asset and notional amount of written credit derivatives for which the Corporation held purchased credit derivatives with identical underlying referenced names were $6.4 billion and $435.1 billion at December 31, 2017.

Offsetting of Derivatives

The Corporation enters into International Swaps and Derivatives Association, Inc. (ISDA) master netting agreements or similar agreements with substantially all of the Corporation's derivative counterparties. Where legally enforceable, these master netting agreements give the Corporation, in the event of default by the counterparty, the right to liquidate securities held as collateral and to offset receivables and payables with the same counterparty. For purposes of the Consolidated Balance Sheet, the Corporation offsets derivative assets and liabilities and cash collateral held with the same counterparty where it has such a legally enforceable master netting agreement.

The following table presents derivative instruments included in derivative assets and liabilities on the Consolidated Balance Sheet at December 31, 2018 and 2017 by primary risk (e.g., interest rate risk) and the platform, where applicable, on which these derivatives are transacted. Balances are presented on a gross basis, prior to the application of counterparty and cash collateral netting. Total gross derivative assets and liabilities are adjusted on an aggregate basis to take into consideration the effects of legally enforceable master netting agreements which include reducing the balance for counterparty netting and cash collateral received or paid.

For more information on offsetting of securities financing agreements, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash*.

Offsetting of Derivatives [1]

(Dollars in billions)	Derivative Assets	Derivative Liabilities	Derivative Assets	Derivative Liabilities
	December 31, 2018		December 31, 2017	
Interest rate contracts				
Over-the-counter	$ 174.2	$ 169.4	$ 211.7	$ 206.0
Over-the-counter cleared	4.8	4.0	1.9	1.8
Foreign exchange contracts				
Over-the-counter	82.5	86.3	78.7	80.8
Over-the-counter cleared	0.9	0.9	0.9	0.7
Equity contracts				
Over-the-counter	24.6	14.6	18.3	16.2
Exchange-traded	16.1	15.1	9.1	8.5
Commodity contracts				
Over-the-counter	3.5	4.5	2.9	4.4
Exchange-traded	1.0	0.9	0.7	0.8
Credit derivatives				
Over-the-counter	7.7	8.2	9.1	9.6
Over-the-counter cleared	2.5	2.3	6.1	6.0
Total gross derivative assets/liabilities, before netting				
Over-the-counter	292.5	283.0	320.7	317.0
Exchange-traded	17.1	16.0	9.8	9.3
Over-the-counter cleared	8.2	7.2	8.9	8.5
Less: Legally enforceable master netting agreements and cash collateral received/paid				
Over-the-counter	(264.4)	(259.2)	(296.9)	(294.6)
Exchange-traded	(13.5)	(13.5)	(8.6)	(8.6)
Over-the-counter cleared	(7.2)	(7.2)	(8.3)	(8.5)
Derivative assets/liabilities, after netting	32.7	26.3	25.6	23.1
Other gross derivative assets/liabilities [2]	11.0	11.6	12.2	11.2
Total derivative assets/liabilities	43.7	37.9	37.8	34.3
Less: Financial instruments collateral [3]	(16.3)	(8.6)	(11.2)	(10.4)
Total net derivative assets/liabilities	$ 27.4	$ 29.3	$ 26.6	$ 23.9

(1) OTC derivatives include bilateral transactions between the Corporation and a particular counterparty. OTC-cleared derivatives include bilateral transactions between the Corporation and a counterparty where the transaction is cleared through a clearinghouse. Exchange-traded derivatives include listed options transacted on an exchange.
(2) Consists of derivatives entered into under master netting agreements where the enforceability of these agreements is uncertain under bankruptcy laws in some countries or industries.
(3) Amounts are limited to the derivative asset/liability balance and, accordingly, do not include excess collateral received/pledged. Financial instruments collateral includes securities collateral received or pledged and cash securities held and posted at third-party custodians that are not offset on the Consolidated Balance Sheet but shown as a reduction to derive net derivative assets and liabilities.

ALM and Risk Management Derivatives

The Corporation's ALM and risk management activities include the use of derivatives to mitigate risk to the Corporation including derivatives designated in qualifying hedge accounting relationships and derivatives used in other risk management activities. Interest rate, foreign exchange, equity, commodity and credit contracts are utilized in the Corporation's ALM and risk management activities.

The Corporation maintains an overall interest rate risk management strategy that incorporates the use of interest rate contracts, which are generally non-leveraged generic interest rate and basis swaps, options, futures and forwards, to minimize significant fluctuations in earnings caused by interest rate volatility. The Corporation's goal is to manage interest rate sensitivity and volatility so that movements in interest rates do not significantly adversely affect earnings or capital. As a result of interest rate fluctuations, hedged fixed-rate assets and liabilities appreciate or depreciate in fair value. Gains or losses on the derivative instruments that are linked to the hedged fixed-rate assets and liabilities are expected to substantially offset this unrealized appreciation or depreciation.

Market risk, including interest rate risk, can be substantial in the mortgage business. Market risk in the mortgage business is the risk that values of mortgage assets or revenues will be adversely affected by changes in market conditions such as interest rate movements. To mitigate the interest rate risk in mortgage banking production income, the Corporation utilizes forward loan sale commitments and other derivative instruments, including purchased options, and certain debt securities. The Corporation also utilizes derivatives such as interest rate options, interest rate swaps, forward settlement contracts and eurodollar futures to hedge certain market risks of MSRs. For more information on MSRs, see *Note 20 – Fair Value Measurements*.

The Corporation uses foreign exchange contracts to manage the foreign exchange risk associated with certain foreign currency-denominated assets and liabilities, as well as the Corporation's investments in non-U.S. subsidiaries. Foreign exchange contracts, which include spot and forward contracts, represent agreements to exchange the currency of one country for the currency of another country at an agreed-upon price on an agreed-upon settlement date. Exposure to loss on these contracts will increase or decrease over their respective lives as currency exchange and interest rates fluctuate.

The Corporation purchases credit derivatives to manage credit risk related to certain funded and unfunded credit exposures. Credit derivatives include CDS, total return swaps and swaptions. These derivatives are recorded on the Consolidated Balance Sheet at fair value with changes in fair value recorded in other income.

Derivatives Designated as Accounting Hedges

The Corporation uses various types of interest rate and foreign exchange derivative contracts to protect against changes in the fair value of its assets and liabilities due to fluctuations in interest rates and exchange rates (fair value hedges). The Corporation also uses these types of contracts to protect against changes in the cash flows of its assets and liabilities, and other forecasted transactions (cash flow hedges). The Corporation hedges its net investment in consolidated non-U.S. operations determined to have functional currencies other than the U.S. dollar using forward exchange contracts and cross-currency basis swaps, and by issuing foreign currency-denominated debt (net investment hedges).

Fair Value Hedges

The table below summarizes information related to fair value hedges for 2018, 2017 and 2016.

Gains and Losses on Derivatives Designated as Fair Value Hedges

	Derivative			Hedged Item		
(Dollars in millions)	2018	2017	2016	2018	2017	2016
Interest rate risk on long-term debt (1)	$ (1,538)	$ (1,537)	$ (1,488)	$ 1,429	$ 1,045	$ 646
Interest rate and foreign currency risk on long-term debt (2)	(1,187)	1,811	(941)	1,079	(1,767)	944
Interest rate risk on available-for-sale securities (3)	(52)	(67)	227	50	35	(286)
Total	$ (2,777)	$ 207	$ (2,202)	$ 2,558	$ (687)	$ 1,304

(1) Amounts are recorded in interest expense in the Consolidated Statement of Income. In 2017 and 2016, amounts representing hedge ineffectiveness were losses of $492 million and $842 million.
(2) In 2018, 2017 and 2016, the derivative amount includes losses of $992 million, gains of $2.2 billion and losses of $910 million, respectively, in other income and losses of $116 million, $365 million and $30 million, respectively, in interest expense. Line item totals are in the Consolidated Statement of Income.
(3) Amounts are recorded in interest income in the Consolidated Statement of Income.

The table below summarizes the carrying value of hedged assets and liabilities that are designated and qualifying in fair value hedging relationships along with the cumulative amount of fair value hedging adjustments included in the carrying value that have been recorded in the current hedging relationships. These fair value hedging adjustments are open basis adjustments that are not subject to amortization as long as the hedging relationship remains designated.

Designated Fair Value Hedged Assets (Liabilities)

	December 31, 2018	
(Dollars in millions)	Carrying Value	Cumulative Fair Value Adjustments (1)
Long-term debt	$ (138,682)	$ (2,117)
Available-for-sale debt securities	981	(29)

(1) For assets, increase (decrease) to carrying value and for liabilities, (increase) decrease to carrying value.

At December 31, 2018, the cumulative fair value adjustments remaining on long-term debt and AFS debt securities from discontinued hedging relationships were a decrease to the related liability and related asset of $1.6 billion and $29 million, which are being amortized over the remaining contractual life of the de-designated hedged items.

Cash Flow and Net Investment Hedges

The following table summarizes certain information related to cash flow hedges and net investment hedges for 2018, 2017 and 2016.

Of the $1.0 billion after-tax net loss ($1.3 billion pretax) on derivatives in accumulated OCI at December 31, 2018, $253 million after-tax ($332 million pretax) is expected to be reclassified into earnings in the next 12 months. These net losses reclassified into earnings are expected to primarily reduce net interest income related to the respective hedged items. For terminated cash flow hedges, the time period over which the majority of the forecasted transactions are hedged is approximately 4 years, with a maximum length of time for certain forecasted transactions of 17 years.

Gains and Losses on Derivatives Designated as Cash Flow and Net Investment Hedges

	Gains (Losses) Recognized in Accumulated OCI on Derivatives			Gains (Losses) in Income Reclassified from Accumulated OCI		
(Dollars in millions, amounts pretax)	2018	2017	2016	2018	2017	2016
Cash flow hedges						
Interest rate risk on variable-rate assets (1)	$ (159)	$ (109)	$ (340)	$ (165)	$ (327)	$ (553)
Price risk on certain restricted stock awards (2)	4	59	41	27	148	(32)
Total	$ (155)	$ (50)	$ (299)	$ (138)	$ (179)	$ (585)
Net investment hedges						
Foreign exchange risk (3)	$ 989	$ (1,588)	$ 1,636	$ 411	$ 1,782	$ 3

(1) Amounts reclassified from accumulated OCI are recorded in interest income in the Consolidated Statement of Income.
(2) Amounts reclassified from accumulated OCI are recorded in personnel expense in the Consolidated Statement of Income.
(3) Amounts reclassified from accumulated OCI are recorded in other income in the Consolidated Statement of Income. Amounts excluded from effectiveness testing and recognized in other income were gains of $47 million, $120 million and $325 million in 2018, 2017 and 2016, respectively.

Other Risk Management Derivatives

Other risk management derivatives are used by the Corporation to reduce certain risk exposures by economically hedging various assets and liabilities. The gains and losses on these derivatives are recognized in other income. The table below presents gains (losses) on these derivatives for 2018, 2017 and 2016. These gains (losses) are largely offset by the income or expense that is recorded on the hedged item.

Gains and Losses on Other Risk Management Derivatives

(Dollars in millions)	2018	2017	2016
Interest rate risk on mortgage activities [1]	$ (107)	$ 8	$ 461
Credit risk on loans	9	(6)	(107)
Interest rate and foreign currency risk on ALM activities [2]	1,010	(36)	(754)

(1) Primarily related to hedges of interest rate risk on MSRs and IRLCs to originate mortgage loans that will be held for sale. The net gains on IRLCs, which are not included in the table but are considered derivative instruments, were $47 million, $220 million and $533 million for 2018, 2017 and 2016, respectively.

(2) Primarily related to hedges of debt securities carried at fair value and hedges of foreign currency-denominated debt.

Transfers of Financial Assets with Risk Retained through Derivatives

The Corporation enters into certain transactions involving the transfer of financial assets that are accounted for as sales where substantially all of the economic exposure to the transferred financial assets is retained through derivatives (e.g., interest rate and/or credit), but the Corporation does not retain control over the assets transferred. As of December 31, 2018 and 2017, the Corporation had transferred $5.8 billion and $6.0 billion of non-U.S. government-guaranteed MBS to a third-party trust and retained economic exposure to the transferred assets through derivative contracts. In connection with these transfers, the Corporation received gross cash proceeds of $5.8 billion and $6.0 billion at the transfer dates. At December 31, 2018 and 2017, the fair value of the transferred securities was $5.5 billion and $6.1 billion.

Sales and Trading Revenue

The Corporation enters into trading derivatives to facilitate client transactions and to manage risk exposures arising from trading account assets and liabilities. It is the Corporation's policy to include these derivative instruments in its trading activities which include derivatives and non-derivative cash instruments. The resulting risk from these derivatives is managed on a portfolio basis as part of the Corporation's *Global Markets* business segment. The related sales and trading revenue generated within *Global Markets* is recorded in various income statement line items including trading account profits and net interest income as well as other revenue categories.

Sales and trading revenue includes changes in the fair value and realized gains and losses on the sales of trading and other assets, net interest income, and fees primarily from commissions on equity securities. Revenue is generated by the difference in the client price for an instrument and the price at which the trading desk can execute the trade in the dealer market. For equity securities, commissions related to purchases and sales are recorded in the "Other" column in the Sales and Trading Revenue table. Changes in the fair value of these securities are included in trading account profits. For debt securities, revenue, with the exception of interest associated with the debt securities, is typically included in trading account profits. Unlike commissions for equity securities, the initial revenue related to broker-dealer services for debt securities is typically included in the pricing of the instrument rather than being charged through separate fee arrangements. Therefore, this revenue is recorded in trading account profits as part of the initial mark to fair value. For derivatives, the majority of revenue is included in trading account profits. In transactions where the Corporation acts as agent, which include exchange-traded futures and options, fees are recorded in other income.

The table below, which includes both derivatives and non-derivative cash instruments, identifies the amounts in the respective income statement line items attributable to the Corporation's sales and trading revenue in *Global Markets*, categorized by primary risk, for 2018, 2017 and 2016. The difference between total trading account profits in the following table and in the Consolidated Statement of Income represents trading activities in business segments other than *Global Markets*. This table includes debit valuation adjustment (DVA) and funding valuation adjustment (FVA) gains (losses). *Global Markets* results in *Note 23 – Business Segment Information* are presented on a fully taxable-equivalent (FTE) basis. The table below is not presented on an FTE basis.

Sales and Trading Revenue

(Dollars in millions)	Trading Account Profits	Net Interest Income	Other [1]	Total
		2018		
Interest rate risk	**$ 1,180**	**$ 1,292**	**$ 220**	**$ 2,692**
Foreign exchange risk	**1,503**	**(7)**	**6**	**1,502**
Equity risk	**3,994**	**(781)**	**1,619**	**4,832**
Credit risk	**1,063**	**1,853**	**552**	**3,468**
Other risk	**189**	**64**	**66**	**319**
Total sales and trading revenue	**$ 7,929**	**$ 2,421**	**$ 2,463**	**$ 12,813**
		2017		
Interest rate risk	$ 712	$ 1,560	$ 249	$ 2,521
Foreign exchange risk	1,417	(1)	7	1,423
Equity risk	2,689	(517)	1,903	4,075
Credit risk	1,685	1,937	576	4,198
Other risk	203	45	76	324
Total sales and trading revenue	$ 6,706	$ 3,024	$ 2,811	$ 12,541
		2016		
Interest rate risk	$ 1,189	$ 2,002	$ 145	$ 3,336
Foreign exchange risk	1,360	(10)	5	1,355
Equity risk	1,917	28	2,074	4,019
Credit risk	1,674	1,956	424	4,054
Other risk	407	(7)	39	439
Total sales and trading revenue	$ 6,547	$ 3,969	$ 2,687	$ 13,203

(1) Represents amounts in investment and brokerage services and other income that are recorded in *Global Markets* and included in the definition of sales and trading revenue. Includes investment and brokerage services revenue of $1.7 billion, $2.0 billion and $2.1 billion for 2018, 2017 and 2016, respectively.

Credit Derivatives

The Corporation enters into credit derivatives primarily to facilitate client transactions and to manage credit risk exposures. Credit derivatives derive value based on an underlying third-party referenced obligation or a portfolio of referenced obligations and generally require the Corporation, as the seller of credit protection, to make payments to a buyer upon the occurrence of a predefined credit event. Such credit events generally include bankruptcy of the referenced credit entity and failure to pay under the obligation, as well as acceleration of indebtedness and payment repudiation or moratorium. For credit derivatives based on a portfolio of referenced credits or credit indices, the Corporation may not be required to make payment until a specified amount of loss has occurred and/or may only be required to make payment up to a specified amount.

Credit derivatives are classified as investment and non-investment grade based on the credit quality of the underlying referenced obligation. The Corporation considers ratings of BBB- or higher as investment grade. Non-investment grade includes non-rated credit derivative instruments. The Corporation discloses internal categorizations of investment grade and non-investment grade consistent with how risk is managed for these instruments.

Credit derivative instruments where the Corporation is the seller of credit protection and their expiration at December 31, 2018 and 2017 are summarized in the following table.

Credit Derivative Instruments

(Dollars in millions)	Less than One Year	One to Three Years	Three to Five Years	Over Five Years	Total
			December 31, 2018		
			Carrying Value		
Credit default swaps:					
Investment grade	$ 2	$ 44	$ 436	$ 488	$ 970
Non-investment grade	132	636	914	1,691	3,373
Total	134	680	1,350	2,179	4,343
Total return swaps/options:					
Investment grade	105	—	—	—	105
Non-investment grade	472	21	—	—	493
Total	577	21	—	—	598
Total credit derivatives	$ 711	$ 701	$ 1,350	$ 2,179	$ 4,941
Credit-related notes:					
Investment grade	$ —	$ —	$ 4	$ 532	$ 536
Non-investment grade	1	1	1	1,500	1,503
Total credit-related notes	$ 1	$ 1	$ 5	$ 2,032	$ 2,039
			Maximum Payout/Notional		
Credit default swaps:					
Investment grade	$ 53,758	$ 95,699	$ 95,274	$ 20,054	$ 264,785
Non-investment grade	24,297	33,881	34,530	14,426	107,134
Total	78,055	129,580	129,804	34,480	371,919
Total return swaps/options:					
Investment grade	60,042	822	59	72	60,995
Non-investment grade	24,524	1,649	39	70	26,282
Total	84,566	2,471	98	142	87,277
Total credit derivatives	$ 162,621	$ 132,051	$ 129,902	$ 34,622	$ 459,196
			December 31, 2017		
			Carrying Value		
Credit default swaps:					
Investment grade	$ 4	$ 3	$ 61	$ 245	$ 313
Non-investment grade	203	453	484	2,133	3,273
Total	207	456	545	2,378	3,586
Total return swaps/options:					
Investment grade	30	—	—	—	30
Non-investment grade	150	—	—	3	153
Total	180	—	—	3	183
Total credit derivatives	$ 387	$ 456	$ 545	$ 2,381	$ 3,769
Credit-related notes:					
Investment grade	$ —	$ —	$ 7	$ 689	$ 696
Non-investment grade	12	4	34	1,548	1,598
Total credit-related notes	$ 12	$ 4	$ 41	$ 2,237	$ 2,294
			Maximum Payout/Notional		
Credit default swaps:					
Investment grade	$ 61,388	$ 115,480	$ 107,081	$ 21,579	$ 305,528
Non-investment grade	39,312	49,843	39,098	14,420	142,673
Total	100,700	165,323	146,179	35,999	448,201
Total return swaps/options:					
Investment grade	37,394	2,581	—	143	40,118
Non-investment grade	13,751	514	143	697	15,105
Total	51,145	3,095	143	840	55,223
Total credit derivatives	$ 151,845	$ 168,418	$ 146,322	$ 36,839	$ 503,424

The notional amount represents the maximum amount payable by the Corporation for most credit derivatives. However, the Corporation does not monitor its exposure to credit derivatives based solely on the notional amount because this measure does not take into consideration the probability of occurrence. As such, the notional amount is not a reliable indicator of the Corporation's exposure to these contracts. Instead, a risk framework is used to define risk tolerances and establish limits so that certain credit risk-related losses occur within acceptable, predefined limits.

Credit-related notes in the table above include investments in securities issued by CDO, collateralized loan obligation (CLO) and credit-linked note vehicles. These instruments are primarily classified as trading securities. The carrying value of these instruments equals the Corporation's maximum exposure to loss. The Corporation is not obligated to make any payments to the entities under the terms of the securities owned.

Credit-related Contingent Features and Collateral

The Corporation executes the majority of its derivative contracts in the OTC market with large, international financial institutions, including broker-dealers and, to a lesser degree, with a variety of non-financial companies. A significant majority of the derivative transactions are executed on a daily margin basis. Therefore, events such as a credit rating downgrade (depending on the ultimate rating level) or a breach of credit covenants would typically require an increase in the amount of collateral required of the counterparty, where applicable, and/or allow the Corporation to take additional protective measures such as early termination of all trades. Further, as previously discussed on page 117, the Corporation enters into legally enforceable master netting agreements which reduce risk by permitting closeout and netting of transactions with the same counterparty upon the occurrence of certain events.

A majority of the Corporation's derivative contracts contain credit risk-related contingent features, primarily in the form of ISDA master netting agreements and credit support documentation that enhance the creditworthiness of these instruments compared to other obligations of the respective counterparty with whom the Corporation has transacted. These contingent features may be for the benefit of the Corporation as well as its counterparties with respect to changes in the Corporation's creditworthiness and the mark-to-market exposure under the derivative transactions. At December 31, 2018 and 2017, the Corporation held cash and securities collateral of $81.6 billion and $77.2 billion, and posted cash and securities collateral of $56.5 billion and $59.2 billion in the normal course of business under derivative agreements, excluding cross-product margining agreements where clients are permitted to margin on a net basis for both derivative and secured financing arrangements.

In connection with certain OTC derivative contracts and other trading agreements, the Corporation can be required to provide additional collateral or to terminate transactions with certain counterparties in the event of a downgrade of the senior debt ratings of the Corporation or certain subsidiaries. The amount of additional collateral required depends on the contract and is usually a fixed incremental amount and/or the market value of the exposure.

At December 31, 2018, the amount of collateral, calculated based on the terms of the contracts, that the Corporation and certain subsidiaries could be required to post to counterparties but had not yet posted to counterparties was $1.8 billion, including $1.0 billion for Bank of America, National Association (Bank of America, N.A. or BANA).

Some counterparties are currently able to unilaterally terminate certain contracts, or the Corporation or certain subsidiaries may be required to take other action such as find a suitable replacement or obtain a guarantee. At December 31, 2018 and 2017, the liability recorded for these derivative contracts was not significant.

The table below presents the amount of additional collateral that would have been contractually required by derivative contracts and other trading agreements at December 31, 2018 if the rating agencies had downgraded their long-term senior debt ratings for the Corporation or certain subsidiaries by one incremental notch and by an additional second incremental notch.

Additional Collateral Required to be Posted Upon Downgrade at December 31, 2018

(Dollars in millions)	One incremental notch	Second incremental notch
Bank of America Corporation	$ 619	$ 347
Bank of America, N.A. and subsidiaries (1)	209	268

(1) Included in Bank of America Corporation collateral requirements in this table.

The following table presents the derivative liabilities that would be subject to unilateral termination by counterparties and the amounts of collateral that would have been contractually required at December 31, 2018 if the long-term senior debt ratings for the Corporation or certain subsidiaries had been lower by one incremental notch and by an additional second incremental notch.

Derivative Liabilities Subject to Unilateral Termination Upon Downgrade at December 31, 2018

(Dollars in millions)	One incremental notch	Second incremental notch
Derivative liabilities	$ 13	$ 581
Collateral posted	1	305

Valuation Adjustments on Derivatives

The Corporation records credit risk valuation adjustments on derivatives in order to properly reflect the credit quality of the counterparties and its own credit quality. The Corporation calculates valuation adjustments on derivatives based on a modeled expected exposure that incorporates current market risk factors. The exposure also takes into consideration credit mitigants such as enforceable master netting agreements and collateral. CDS spread data is used to estimate the default probabilities and severities that are applied to the exposures. Where no observable credit default data is available for counterparties, the Corporation uses proxies and other market data to estimate default probabilities and severity.

Valuation adjustments on derivatives are affected by changes in market spreads, non-credit related market factors such as interest rate and currency changes that affect the expected exposure, and other factors like changes in collateral arrangements and partial payments. Credit spreads and non-credit factors can move independently. For example, for an interest rate swap, changes in interest rates may increase the expected exposure, which would increase the counterparty credit valuation adjustment (CVA). Independently, counterparty credit spreads may tighten, which would result in an offsetting decrease to CVA.

The Corporation enters into risk management activities to offset market driven exposures. The Corporation often hedges the counterparty spread risk in CVA with CDS. The Corporation hedges other market risks in both CVA and DVA primarily with currency and interest rate swaps. In certain instances, the net-of-hedge amounts in the table below move in the same direction as the gross amount or may move in the opposite direction. This movement is a consequence of the complex interaction of the risks being hedged, resulting in limitations in the ability to perfectly hedge all of the market exposures at all times.

The table below presents CVA, DVA and FVA gains (losses) on derivatives, which are recorded in trading account profits, on a gross and net of hedge basis for 2018, 2017 and 2016. CVA gains reduce the cumulative CVA thereby increasing the derivative assets balance. DVA gains increase the cumulative DVA thereby decreasing the derivative liabilities balance. CVA and DVA losses have the opposite impact. FVA gains related to derivative assets reduce the cumulative FVA thereby increasing the derivative assets balance. FVA gains related to derivative liabilities increase the cumulative FVA thereby decreasing the derivative liabilities balance. FVA losses have the opposite impact.

Valuation Adjustments on Derivatives (1)

Gains (Losses)	Gross	Net	Gross	Net	Gross	Net
(Dollars in millions)	**2018**		2017		2016	
Derivative assets (CVA)	**$ 77**	**$ 187**	$ 330	$ 98	$ 374	$ 214
Derivative assets/ liabilities (FVA)	**(15)**	**14**	160	178	186	102
Derivative liabilities (DVA)	**(19)**	**(55)**	(324)	(281)	24	(141)

(1) At December 31, 2018, 2017 and 2016, cumulative CVA reduced the derivative assets balance by $600 million, $677 million and $1.0 billion, cumulative FVA reduced the net derivatives balance by $151 million, $136 million and $296 million, and cumulative DVA reduced the derivative liabilities balance by $432 million, $450 million and $774 million, respectively.

NOTE 4 Securities

The table below presents the amortized cost, gross unrealized gains and losses, and fair value of AFS debt securities, other debt securities carried at fair value and HTM debt securities at December 31, 2018 and 2017.

Debt Securities

(Dollars in millions)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	December 31, 2018			
Available-for-sale debt securities				
Mortgage-backed securities:				
Agency	$ 125,116	$ 138	$ (3,428)	$ 121,826
Agency-collateralized mortgage obligations	5,621	19	(110)	5,530
Commercial	14,469	11	(402)	14,078
Non-agency residential (1)	1,792	136	(11)	1,917
Total mortgage-backed securities	146,998	304	(3,951)	143,351
U.S. Treasury and agency securities	56,239	62	(1,378)	54,923
Non-U.S. securities	9,307	5	(6)	9,306
Other taxable securities, substantially all asset-backed securities	4,387	29	(6)	4,410
Total taxable securities	216,931	400	(5,341)	211,990
Tax-exempt securities	17,349	99	(72)	17,376
Total available-for-sale debt securities	234,280	499	(5,413)	229,366
Other debt securities carried at fair value	8,595	172	(32)	8,735
Total debt securities carried at fair value	242,875	671	(5,445)	238,101
Held-to-maturity debt securities, substantially all U.S. agency mortgage-backed securities (2)	203,652	747	(3,964)	200,435
Total debt securities (3, 4)	$ 446,527	$ 1,418	$ (9,409)	$ 438,536
	December 31, 2017			
Available-for-sale debt securities				
Mortgage-backed securities:				
Agency	$ 194,119	$ 506	$ (1,696)	$ 192,929
Agency-collateralized mortgage obligations	6,846	39	(81)	6,804
Commercial	13,864	28	(208)	13,684
Non-agency residential (1)	2,410	267	(8)	2,669
Total mortgage-backed securities	217,239	840	(1,993)	216,086
U.S. Treasury and agency securities	54,523	18	(1,018)	53,523
Non-U.S. securities	6,669	9	(1)	6,677
Other taxable securities, substantially all asset-backed securities	5,699	73	(2)	5,770
Total taxable securities	284,130	940	(3,014)	282,056
Tax-exempt securities	20,541	138	(104)	20,575
Total available-for-sale debt securities	304,671	1,078	(3,118)	302,631
Other debt securities carried at fair value	12,273	252	(39)	12,486
Total debt securities carried at fair value	316,944	1,330	(3,157)	315,117
Held-to-maturity debt securities, substantially all U.S. agency mortgage-backed securities	125,013	111	(1,825)	123,299
Total debt securities (3, 4)	$ 441,957	$ 1,441	$ (4,982)	$ 438,416
Available-for-sale marketable equity securities (5)	$ 27	$ —	$ (2)	$ 25

(1) At December 31, 2018 and 2017, the underlying collateral type included approximately 68 percent and 62 percent prime, 4 percent and 13 percent Alt-A, and 28 percent and 25 percent subprime.
(2) During 2018, the Corporation transferred AFS debt securities with an amortized cost of $64.5 billion to held to maturity.
(3) Includes securities pledged as collateral of $40.6 billion and $35.8 billion at December 31, 2018 and 2017.
(4) The Corporation had debt securities from FNMA and FHLMC that each exceeded 10 percent of shareholders' equity, with an amortized cost of $161.2 billion and $52.2 billion, and a fair value of $158.5 billion and $51.4 billion at December 31, 2018, and an amortized cost of $163.6 billion and $50.3 billion, and a fair value of $162.1 billion and $50.0 billion at December 31, 2017.
(5) Classified in other assets on the Consolidated Balance Sheet.

At December 31, 2018, the accumulated net unrealized loss on AFS debt securities included in accumulated OCI was $3.7 billion, net of the related income tax benefit of $1.2 billion. The Corporation had nonperforming AFS debt securities of $11 million and $99 million at December 31, 2018 and 2017.

Effective January 1, 2018, the Corporation adopted an accounting standard applicable to equity securities. For additional information, see *Note 1 – Summary of Significant Accounting Principles*. At December 31, 2018, the Corporation held equity securities at an aggregate fair value of $893 million and other equity securities, as valued under the measurement alternative, at cost of $219 million, both of which are included in other assets. At December 31, 2018, the Corporation also held equity securities at fair value of $1.2 billion included in time deposits placed and other short-term investments.

The following table presents the components of other debt securities carried at fair value where the changes in fair value are reported in other income. In 2018, the Corporation recorded unrealized mark-to-market net losses of $73 million and realized net gains of $140 million, and unrealized mark-to-market net gains of $243 million and realized net losses of $49 million in 2017. These amounts exclude hedge results.

Other Debt Securities Carried at Fair Value

(Dollars in millions)	December 31 2018	2017
Mortgage-backed securities	$ 1,606	$ 2,769
U.S. Treasury and agency securities	1,282	—
Non-U.S. securities [1]	5,844	9,488
Other taxable securities, substantially all asset-backed securities	3	229
Total	$ 8,735	$ 12,486

[1] These securities are primarily used to satisfy certain international regulatory liquidity requirements.

The gross realized gains and losses on sales of AFS debt securities for 2018, 2017 and 2016 are presented in the table below.

Gains and Losses on Sales of AFS Debt Securities

(Dollars in millions)	2018	2017	2016
Gross gains	$ 169	$ 352	$ 520
Gross losses	(15)	(97)	(30)
Net gains on sales of AFS debt securities	$ 154	$ 255	$ 490
Income tax expense attributable to realized net gains on sales of AFS debt securities	$ 37	$ 97	$ 186

The table below presents the fair value and the associated gross unrealized losses on AFS debt securities and whether these securities have had gross unrealized losses for less than 12 months or for 12 months or longer at December 31, 2018 and 2017.

Temporarily Impaired and Other-than-temporarily Impaired AFS Debt Securities

	Less than Twelve Months		Twelve Months or Longer		Total	
(Dollars in millions)	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
	December 31, 2018					
Temporarily impaired AFS debt securities						
Mortgage-backed securities:						
Agency	$ 14,771	$ (49)	$ 99,211	$ (3,379)	$ 113,982	$ (3,428)
Agency-collateralized mortgage obligations	3	—	4,452	(110)	4,455	(110)
Commercial	1,344	(8)	11,991	(394)	13,335	(402)
Non-agency residential	106	(8)	49	(3)	155	(11)
Total mortgage-backed securities	16,224	(65)	115,703	(3,886)	131,927	(3,951)
U.S. Treasury and agency securities	288	(1)	51,374	(1,377)	51,662	(1,378)
Non-U.S. securities	773	(5)	21	(1)	794	(6)
Other taxable securities, substantially all asset-backed securities	183	(1)	185	(5)	368	(6)
Total taxable securities	17,468	(72)	167,283	(5,269)	184,751	(5,341)
Tax-exempt securities	232	(2)	2,148	(70)	2,380	(72)
Total temporarily impaired AFS debt securities	17,700	(74)	169,431	(5,339)	187,131	(5,413)
Other-than-temporarily impaired AFS debt securities [1]						
Non-agency residential mortgage-backed securities	131	—	3	—	134	—
Total temporarily impaired and other-than-temporarily impaired AFS debt securities	$ 17,831	$ (74)	$ 169,434	$ (5,339)	$ 187,265	$ (5,413)
	December 31, 2017					
Temporarily impaired AFS debt securities						
Mortgage-backed securities:						
Agency	$ 73,535	$ (352)	$ 72,612	$ (1,344)	$ 146,147	$ (1,696)
Agency-collateralized mortgage obligations	2,743	(29)	1,684	(52)	4,427	(81)
Commercial	5,575	(50)	4,586	(158)	10,161	(208)
Non-agency residential	335	(7)	—	—	335	(7)
Total mortgage-backed securities	82,188	(438)	78,882	(1,554)	161,070	(1,992)
U.S. Treasury and agency securities	27,537	(251)	24,035	(767)	51,572	(1,018)
Non-U.S. securities	772	(1)	—	—	772	(1)
Other taxable securities, substantially all asset-backed securities	—	—	92	(2)	92	(2)
Total taxable securities	110,497	(690)	103,009	(2,323)	213,506	(3,013)
Tax-exempt securities	1,090	(2)	7,100	(102)	8,190	(104)
Total temporarily impaired AFS debt securities	111,587	(692)	110,109	(2,425)	221,696	(3,117)
Other-than-temporarily impaired AFS debt securities [1]						
Non-agency residential mortgage-backed securities	58	(1)	—	—	58	(1)
Total temporarily impaired and other-than-temporarily impaired AFS debt securities	$ 111,645	$ (693)	$ 110,109	$ (2,425)	$ 221,754	$ (3,118)

[1] Includes other than temporarily impaired AFS debt securities on which an OTTI loss, primarily related to changes in interest rates, remains in accumulated OCI.

In 2018, 2017 and 2016, the Corporation had $33 million, $41 million and $19 million, respectively, of credit-related OTTI losses on AFS debt securities which were recognized in other income. The amount of noncredit-related OTTI losses recognized in OCI was not significant for all periods presented.

The cumulative OTTI credit losses recognized in income on AFS debt securities that the Corporation does not intend to sell were $120 million, $274 million and $253 million at December 31, 2018, 2017 and 2016, respectively.

The Corporation estimates the portion of a loss on a security that is attributable to credit using a discounted cash flow model and estimates the expected cash flows of the underlying collateral using internal credit, interest rate and prepayment risk models that incorporate management's best estimate of current key assumptions such as default rates, loss severity and prepayment rates. Assumptions used for the underlying loans that support the MBS can vary widely from loan to loan and are influenced by such factors as loan interest rate, geographic location of the borrower, borrower characteristics and collateral type. Based on these assumptions, the Corporation then determines how the underlying collateral cash flows will be distributed to each MBS issued from the applicable special purpose entity. Expected principal and interest cash flows on an impaired AFS debt security are discounted using the effective yield of each individual impaired AFS debt security.

Significant assumptions used in estimating the expected cash flows for measuring credit losses on non-agency residential mortgage-backed securities (RMBS) were as follows at December 31, 2018.

Significant Assumptions

	Weighted average	Range (1) 10th Percentile (2)	90th Percentile (2)
Prepayment speed	12.9%	3.3%	21.5%
Loss severity	19.8	8.5	36.4
Life default rate	16.9	1.4	64.4

(1) Represents the range of inputs/assumptions based upon the underlying collateral.
(2) The value of a variable below which the indicated percentile of observations will fall.

Annual constant prepayment speed and loss severity rates are projected considering collateral characteristics such as LTV, creditworthiness of borrowers as measured using Fair Isaac Corporation (FICO) scores, and geographic concentrations. The weighted-average severity by collateral type was 16.0 percent for prime, 16.6 percent for Alt-A and 25.6 percent for subprime at December 31, 2018. Default rates are projected by considering collateral characteristics including, but not limited to, LTV, FICO and geographic concentration. Weighted-average life default rates by collateral type were 14.7 percent for prime, 16.6 percent for Alt-A and 19.1 percent for subprime at December 31, 2018.

The remaining contractual maturity distribution and yields of the Corporation's debt securities carried at fair value and HTM debt securities at December 31, 2018 are summarized in the table below. Actual duration and yields may differ as prepayments on the loans underlying the mortgages or other ABS are passed through to the Corporation.

Maturities of Debt Securities Carried at Fair Value and Held-to-maturity Debt Securities

(Dollars in millions)	Due in One Year or Less Amount	Yield (1)	Due after One Year through Five Years Amount	Yield (1)	Due after Five Years through Ten Years Amount	Yield (1)	Due after Ten Years Amount	Yield (1)	Total Amount	Yield (1)
Amortized cost of debt securities carried at fair value										
Mortgage-backed securities:										
Agency	$ —	—%	$ 114	2.42%	$ 1,245	2.39%	$123,757	3.34%	$125,116	3.33%
Agency-collateralized mortgage obligations	—	—	—	—	30	2.50	5,591	3.17	5,621	3.17
Commercial	198	1.78	2,467	2.36	10,976	2.53	828	2.96	14,469	2.52
Non-agency residential	—	—	—	—	14	—	3,268	9.88	3,282	9.84
Total mortgage-backed securities	198	1.78	2,581	2.36	12,265	2.51	133,444	3.49	148,488	3.39
U.S. Treasury and agency securities	670	0.78	33,659	1.48	23,159	2.36	21	2.57	57,509	1.83
Non-U.S. securities	14,318	1.30	682	1.88	21	4.43	121	6.57	15,142	1.37
Other taxable securities, substantially all asset-backed securities	1,591	3.34	2,022	3.54	688	3.48	86	5.59	4,387	3.49
Total taxable securities	16,777	1.48	38,944	1.66	36,133	2.43	133,672	3.49	225,526	2.85
Tax-exempt securities	938	2.59	7,526	2.59	6,162	2.44	2,723	2.55	17,349	2.53
Total amortized cost of debt securities carried at fair value	**$ 17,715**	**1.54**	**$ 46,470**	**1.81**	**$ 42,295**	**2.43**	**$ 136,395**	**3.47**	**$ 242,875**	**2.83**
Amortized cost of HTM debt securities (2)	**$ 657**	**5.78**	**$ 18**	**3.93**	**$ 1,475**	**2.89**	**$ 201,502**	**3.23**	**$ 203,652**	**3.24**
Debt securities carried at fair value										
Mortgage-backed securities:										
Agency	$ —		$ 114		$ 1,219		$120,493		$121,826	
Agency-collateralized mortgage obligations	—		—		29		5,501		5,530	
Commercial	198		2,425		10,656		799		14,078	
Non-agency residential	—		—		24		3,499		3,523	
Total mortgage-backed securities	198		2,539		11,928		130,292		144,957	
U.S. Treasury and agency securities	669		32,694		22,821		21		56,205	
Non-U.S. securities	14,315		692		19		124		15,150	
Other taxable securities, substantially all asset-backed securities	1,585		2,043		698		87		4,413	
Total taxable securities	16,767		37,968		35,466		130,524		220,725	
Tax-exempt securities	936		7,537		6,184		2,719		17,376	
Total debt securities carried at fair value	**$ 17,703**		**$ 45,505**		**$ 41,650**		**$ 133,243**		**$ 238,101**	
Fair value of HTM debt securities (2)	**$ 657**		**$ 18**		**$ 1,429**		**$ 198,331**		**$ 200,435**	

(1) The weighted average yield is computed based on a constant effective interest rate over the contractual life of each security. The average yield considers the contractual coupon and the amortization of premiums and accretion of discounts, excluding the effect of related hedging derivatives.
(2) Substantially all U.S. agency MBS.

NOTE 5 Outstanding Loans and Leases

The following tables present total outstanding loans and leases and an aging analysis for the Consumer Real Estate, Credit Card and Other Consumer, and Commercial portfolio segments, by class of financing receivables, at December 31, 2018 and 2017.

(Dollars in millions)	30-59 Days Past Due (1)	60-89 Days Past Due (1)	90 Days or More Past Due (2)	Total Past Due 30 Days or More	Total Current or Less Than 30 Days Past Due (3)	Purchased Credit-impaired (4)	Loans Accounted for Under the Fair Value Option	Total Outstandings
	December 31, 2018							
Consumer real estate								
Core portfolio								
Residential mortgage	$ 1,188	$ 249	$ 793	$ 2,230	$ 191,465			$ 193,695
Home equity	200	85	387	672	39,338			40,010
Non-core portfolio								
Residential mortgage	624	268	2,012	2,904	8,158	$ 3,800		14,862
Home equity	119	60	287	466	6,965	845		8,276
Credit card and other consumer								
U.S. credit card	577	418	994	1,989	96,349			98,338
Direct/Indirect consumer (5)	317	90	40	447	90,719			91,166
Other consumer (6)	—	—	—	—	202			202
Total consumer	3,025	1,170	4,513	8,708	433,196	4,645		446,549
Consumer loans accounted for under the fair value option (7)							$ 682	682
Total consumer loans and leases	3,025	1,170	4,513	8,708	433,196	4,645	682	447,231
Commercial								
U.S. commercial	594	232	573	1,399	297,878			299,277
Non-U.S. commercial	1	49	—	50	98,726			98,776
Commercial real estate (8)	29	16	14	59	60,786			60,845
Commercial lease financing	124	114	37	275	22,259			22,534
U.S. small business commercial	83	54	96	233	14,332			14,565
Total commercial	831	465	720	2,016	493,981			495,997
Commercial loans accounted for under the fair value option (7)							3,667	3,667
Total commercial loans and leases	831	465	720	2,016	493,981		3,667	499,664
Total loans and leases (9)	$ 3,856	$ 1,635	$ 5,233	$ 10,724	$ 927,177	$ 4,645	$ 4,349	$ 946,895
Percentage of outstandings	0.41%	0.17%	0.55%	1.13%	97.92%	0.49%	0.46%	100.00%

(1) Consumer real estate loans 30-59 days past due includes fully-insured loans of $637 million and nonperforming loans of $217 million. Consumer real estate loans 60-89 days past due includes fully-insured loans of $269 million and nonperforming loans of $146 million.
(2) Consumer real estate includes fully-insured loans of $1.9 billion.
(3) Consumer real estate includes $1.8 billion and direct/indirect consumer includes $53 million of nonperforming loans.
(4) PCI loan amounts are shown gross of the valuation allowance.
(5) Total outstandings includes auto and specialty lending loans and leases of $50.1 billion, unsecured consumer lending loans of $383 million, U.S. securities-based lending loans of $37.0 billion, non-U.S. consumer loans of $2.9 billion and other consumer loans of $746 million.
(6) Substantially all of other consumer is consumer overdrafts.
(7) Consumer loans accounted for under the fair value option includes residential mortgage loans of $336 million and home equity loans of $346 million. Commercial loans accounted for under the fair value option includes U.S. commercial loans of $2.5 billion and non-U.S. commercial loans of $1.1 billion. For additional information, see *Note 20 – Fair Value Measurements* and *Note 21 – Fair Value Option*.
(8) Total outstandings includes U.S. commercial real estate loans of $56.6 billion and non-U.S. commercial real estate loans of $4.2 billion.
(9) Total outstandings includes loans and leases pledged as collateral of $36.7 billion. The Corporation also pledged $166.1 billion of loans with no related outstanding borrowings to secure potential borrowing capacity with the Federal Reserve Bank and Federal Home Loan Bank (FHLB).

(Dollars in millions)	30-59 Days Past Due (1)	60-89 Days Past Due (1)	90 Days or More Past Due (2)	Total Past Due 30 Days or More	Total Current or Less Than 30 Days Past Due (3)	Purchased Credit-impaired (4)	Loans Accounted for Under the Fair Value Option	Total Outstandings
	December 31, 2017							
Consumer real estate								
Core portfolio								
Residential mortgage	$ 1,242	$ 321	$ 1,040	$ 2,603	$ 174,015			$ 176,618
Home equity	215	108	473	796	43,449			44,245
Non-core portfolio								
Residential mortgage	1,028	468	3,535	5,031	14,161	$ 8,001		27,193
Home equity	224	121	572	917	9,866	2,716		13,499
Credit card and other consumer								
U.S. credit card	542	405	900	1,847	94,438			96,285
Direct/Indirect consumer (5)	330	104	44	478	95,864			96,342
Other consumer (6)	—	—	—	—	166			166
Total consumer	3,581	1,527	6,564	11,672	431,959	10,717		454,348
Consumer loans accounted for under the fair value option (7)							$ 928	928
Total consumer loans and leases	3,581	1,527	6,564	11,672	431,959	10,717	928	455,276
Commercial								
U.S. commercial	547	244	425	1,216	283,620			284,836
Non-U.S. commercial	52	1	3	56	97,736			97,792
Commercial real estate (8)	48	10	29	87	58,211			58,298
Commercial lease financing	110	68	26	204	21,912			22,116
U.S. small business commercial	95	45	88	228	13,421			13,649
Total commercial	852	368	571	1,791	474,900			476,691
Commercial loans accounted for under the fair value option (7)							4,782	4,782
Total commercial loans and leases	852	368	571	1,791	474,900		4,782	481,473
Total loans and leases (9)	$ 4,433	$ 1,895	$ 7,135	$ 13,463	$ 906,859	$ 10,717	$ 5,710	$ 936,749
Percentage of outstandings	0.48%	0.20%	0.76%	1.44%	96.81%	1.14%	0.61%	100.00%

(1) Consumer real estate loans 30-59 days past due includes fully-insured loans of $850 million and nonperforming loans of $253 million. Consumer real estate loans 60-89 days past due includes fully-insured loans of $386 million and nonperforming loans of $195 million.
(2) Consumer real estate includes fully-insured loans of $3.2 billion.
(3) Consumer real estate includes $2.3 billion and direct/indirect consumer includes $43 million of nonperforming loans.
(4) PCI loan amounts are shown gross of the valuation allowance.
(5) Total outstandings includes auto and specialty lending loans and leases of $52.4 billion, unsecured consumer lending loans of $469 million, U.S. securities-based lending loans of $39.8 billion, non-U.S. consumer loans of $3.0 billion and other consumer loans of $684 million.
(6) Substantially all of other consumer is consumer overdrafts.
(7) Consumer loans accounted for under the fair value option includes residential mortgage loans of $567 million and home equity loans of $361 million. Commercial loans accounted for under the fair value option includes U.S. commercial loans of $2.6 billion and non-U.S. commercial loans of $2.2 billion. For additional information, see *Note 20 – Fair Value Measurements* and *Note 21 – Fair Value Option*.
(8) Total outstandings includes U.S. commercial real estate loans of $54.8 billion and non-U.S. commercial real estate loans of $3.5 billion.
(9) Total outstandings includes loans and leases pledged as collateral of $40.1 billion. The Corporation also pledged $160.3 billion of loans with no related outstanding borrowings to secure potential borrowing capacity with the Federal Reserve Bank and FHLB.

The Corporation categorizes consumer real estate loans as core and non-core based on loan and customer characteristics such as origination date, product type, LTV, FICO score and delinquency status consistent with its current consumer and mortgage servicing strategy. Generally, loans that were originated after January 1, 2010, qualified under government-sponsored enterprise (GSE) underwriting guidelines, or otherwise met the Corporation's underwriting guidelines in place in 2015 are characterized as core loans. All other loans are generally characterized as non-core loans and represent runoff portfolios.

The Corporation has entered into long-term credit protection agreements with FNMA and FHLMC on loans totaling $6.1 billion and $6.3 billion at December 31, 2018 and 2017, providing full credit protection on residential mortgage loans that become severely delinquent. All of these loans are individually insured and therefore the Corporation does not record an allowance for credit losses related to these loans.

During 2018, the Corporation sold $11.6 billion of consumer real estate loans compared to $4.0 billion in 2017. In addition to recurring loan sales, the 2018 amount includes sales of loans, primarily non-core, with a carrying value of $9.6 billion and related gains of $731 million recorded in other income in the Consolidated Statement of Income.

Nonperforming Loans and Leases

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

The Corporation classifies consumer real estate loans that have been discharged in Chapter 7 bankruptcy and not reaffirmed by the borrower as TDRs, irrespective of payment history or delinquency status, even if the repayment terms for the loan have not been otherwise modified. The Corporation continues to have a lien on the underlying collateral. At December 31, 2018, nonperforming loans discharged in Chapter 7 bankruptcy with no change in repayment terms were $185 million of which $98 million were current on their contractual payments, while $70 million were 90 days or more past due. Of the contractually current nonperforming loans, 63 percent were discharged in Chapter 7 bankruptcy over 12 months ago, and 55 percent were discharged 24 months or more ago.

During 2018, the Corporation sold nonperforming and PCI consumer real estate loans with a carrying value of $5.3 billion, including $4.4 billion of PCI loans, compared to $1.3 billion, including $803 million of PCI loans, in 2017.

The table below presents the Corporation's nonperforming loans and leases including nonperforming TDRs, and loans accruing past due 90 days or more at December 31, 2018 and 2017. Nonperforming LHFS are excluded from nonperforming loans and leases as they are recorded at either fair value or the lower of cost or fair value. For more information on the criteria for classification as nonperforming, see *Note 1 – Summary of Significant Accounting Principles*.

Credit Quality

	Nonperforming Loans and Leases		Accruing Past Due 90 Days or More	
	December 31			
(Dollars in millions)	**2018**	2017	**2018**	2017
Consumer real estate				
Core portfolio				
Residential mortgage [1]	**$ 1,010**	$ 1,087	**$ 274**	$ 417
Home equity	**955**	1,079	**—**	—
Non-core portfolio				
Residential mortgage [1]	**883**	1,389	**1,610**	2,813
Home equity	**938**	1,565	**—**	—
Credit card and other consumer				
U.S. credit card	**n/a**	n/a	**994**	900
Direct/Indirect consumer	**56**	46	**38**	40
Total consumer	**3,842**	5,166	**2,916**	4,170
Commercial				
U.S. commercial	**794**	814	**197**	144
Non-U.S. commercial	**80**	299	**—**	3
Commercial real estate	**156**	112	**4**	4
Commercial lease financing	**18**	24	**29**	19
U.S. small business commercial	**54**	55	**84**	75
Total commercial	**1,102**	1,304	**314**	245
Total loans and leases	**$ 4,944**	$ 6,470	**$ 3,230**	$ 4,415

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

n/a = not applicable

Credit Quality Indicators

The Corporation monitors credit quality within its Consumer Real Estate, Credit Card and Other Consumer, and Commercial portfolio segments based on primary credit quality indicators. For more information on the portfolio segments, see *Note 1 – Summary of Significant Accounting Principles*. Within the Consumer Real Estate portfolio segment, the primary credit quality indicators are refreshed LTV and refreshed FICO score. Refreshed LTV measures the carrying value of the loan as a percentage of the value of the property securing the loan, refreshed quarterly. Home equity loans are evaluated using CLTV which measures the carrying value of the Corporation's loan and available line of credit combined with any outstanding senior liens against the property as a percentage of the value of the property securing the loan, refreshed quarterly. FICO score measures the creditworthiness of the borrower based on the financial obligations of the borrower and the borrower's credit history. FICO scores are typically refreshed quarterly or more frequently. Certain borrowers (e.g., borrowers that have had debts discharged in a bankruptcy proceeding) may not have their FICO scores updated. FICO scores are also a primary credit quality indicator for the Credit Card and Other Consumer portfolio segment and the business card portfolio within U.S. small business commercial. Within the Commercial portfolio segment, loans are evaluated using the internal classifications of pass rated or reservable criticized as the primary credit quality indicators. The term reservable criticized refers to those commercial loans that are internally classified or listed by the Corporation as Special Mention, Substandard or Doubtful, which are asset quality categories defined by regulatory authorities. These assets have an elevated level of risk and may have a high probability of default or total loss. Pass rated refers to all loans not considered reservable criticized. In addition to these primary credit quality indicators, the Corporation uses other credit quality indicators for certain types of loans.

The following tables present certain credit quality indicators for the Corporation's Consumer Real Estate, Credit Card and Other Consumer, and Commercial portfolio segments, by class of financing receivables, at December 31, 2018 and 2017.

Consumer Real Estate – Credit Quality Indicators [(1)]

(Dollars in millions)	Core Residential Mortgage [(2)]	Non-core Residential Mortgage [(2)]	Residential Mortgage PCI	Core Home Equity [(2)]	Non-core Home Equity [(2)]	Home Equity PCI
	December 31, 2018					
Refreshed LTV [(3)]						
Less than or equal to 90 percent	$ 173,911	$ 6,861	$ 3,411	$ 39,246	$ 5,870	$ 608
Greater than 90 percent but less than or equal to 100 percent	2,349	340	193	354	603	112
Greater than 100 percent	817	349	196	410	958	125
Fully-insured loans [(4)]	16,618	3,512				
Total consumer real estate	**$ 193,695**	**$ 11,062**	**$ 3,800**	**$ 40,010**	**$ 7,431**	**$ 845**
Refreshed FICO score						
Less than 620	$ 2,125	$ 1,264	$ 710	$ 1,064	$ 1,325	$ 178
Greater than or equal to 620 and less than 680	4,538	1,068	651	2,008	1,575	145
Greater than or equal to 680 and less than 740	23,841	1,841	1,201	7,008	1,968	220
Greater than or equal to 740	146,573	3,377	1,238	29,930	2,563	302
Fully-insured loans [(4)]	16,618	3,512				
Total consumer real estate	**$ 193,695**	**$ 11,062**	**$ 3,800**	**$ 40,010**	**$ 7,431**	**$ 845**

(1) Excludes $682 million of loans accounted for under the fair value option.
(2) Excludes PCI loans.
(3) Refreshed LTV percentages for PCI loans are calculated using the carrying value net of the related valuation allowance.
(4) Credit quality indicators are not reported for fully-insured loans as principal repayment is insured.

Credit Card and Other Consumer – Credit Quality Indicators

(Dollars in millions)	U.S. Credit Card	Direct/Indirect Consumer	Other Consumer
	December 31, 2018		
Refreshed FICO score			
Less than 620	$ 5,016	$ 1,719	
Greater than or equal to 620 and less than 680	12,415	3,124	
Greater than or equal to 680 and less than 740	35,781	8,921	
Greater than or equal to 740	45,126	36,709	
Other internal credit metrics [(1, 2)]		40,693	$ 202
Total credit card and other consumer	**$ 98,338**	**$ 91,166**	**$ 202**

(1) Other internal credit metrics may include delinquency status, geography or other factors.
(2) Direct/indirect consumer includes $39.9 billion of securities-based lending which is overcollateralized and therefore has minimal credit risk.

Commercial – Credit Quality Indicators [(1)]

(Dollars in millions)	U.S. Commercial	Non-U.S. Commercial	Commercial Real Estate	Commercial Lease Financing	U.S. Small Business Commercial [(2)]
	December 31, 2018				
Risk ratings					
Pass rated	$ 291,918	$ 97,916	$ 59,910	$ 22,168	$ 389
Reservable criticized	7,359	860	935	366	29
Refreshed FICO score [(3)]					
Less than 620					264
Greater than or equal to 620 and less than 680					684
Greater than or equal to 680 and less than 740					2,072
Greater than or equal to 740					4,254
Other internal credit metrics [(3, 4)]					6,873
Total commercial	**$ 299,277**	**$ 98,776**	**$ 60,845**	**$ 22,534**	**$ 14,565**

(1) Excludes $3.7 billion of loans accounted for under the fair value option.
(2) U.S. small business commercial includes $731 million of criticized business card and small business loans which are evaluated using refreshed FICO scores or internal credit metrics, including delinquency status, rather than risk ratings. At December 31, 2018, 99 percent of the balances where internal credit metrics are used was current or less than 30 days past due.
(3) Refreshed FICO score and other internal credit metrics are applicable only to the U.S. small business commercial portfolio.
(4) Other internal credit metrics may include delinquency status, application scores, geography or other factors.

Consumer Real Estate – Credit Quality Indicators (1)

(Dollars in millions)	Core Residential Mortgage (2)	Non-core Residential Mortgage (2)	Residential Mortgage PCI	Core Home Equity (2)	Non-core Home Equity (2)	Home Equity PCI
	December 31, 2017					
Refreshed LTV (3)						
Less than or equal to 90 percent	$ 153,669	$ 12,135	$ 6,872	$ 43,048	$ 7,944	$ 1,781
Greater than 90 percent but less than or equal to 100 percent	3,082	850	559	549	1,053	412
Greater than 100 percent	1,322	1,011	570	648	1,786	523
Fully-insured loans (4)	18,545	5,196				
Total consumer real estate	$ 176,618	$ 19,192	$ 8,001	$ 44,245	$ 10,783	$ 2,716
Refreshed FICO score						
Less than 620	$ 2,234	$ 2,390	$ 1,941	$ 1,169	$ 2,098	$ 452
Greater than or equal to 620 and less than 680	4,531	2,086	1,657	2,371	2,393	466
Greater than or equal to 680 and less than 740	22,934	3,519	2,396	8,115	2,723	786
Greater than or equal to 740	128,374	6,001	2,007	32,590	3,569	1,012
Fully-insured loans (4)	18,545	5,196				
Total consumer real estate	$ 176,618	$ 19,192	$ 8,001	$ 44,245	$ 10,783	$ 2,716

(1) Excludes $928 million of loans accounted for under the fair value option.
(2) Excludes PCI loans.
(3) Refreshed LTV percentages for PCI loans are calculated using the carrying value net of the related valuation allowance.
(4) Credit quality indicators are not reported for fully-insured loans as principal repayment is insured.

Credit Card and Other Consumer – Credit Quality Indicators

(Dollars in millions)	U.S. Credit Card	Direct/Indirect Consumer	Other Consumer
	December 31, 2017		
Refreshed FICO score			
Less than 620	$ 4,730	$ 2,005	
Greater than or equal to 620 and less than 680	12,422	4,064	
Greater than or equal to 680 and less than 740	35,656	10,371	
Greater than or equal to 740	43,477	36,445	
Other internal credit metrics (1, 2)		43,457	$ 166
Total credit card and other consumer	$ 96,285	$ 96,342	$ 166

(1) Other internal credit metrics may include delinquency status, geography or other factors.
(2) Direct/indirect consumer includes $42.8 billion of securities-based lending which is overcollateralized and therefore has minimal credit risk.

Commercial – Credit Quality Indicators (1)

(Dollars in millions)	U.S. Commercial	Non-U.S. Commercial	Commercial Real Estate	Commercial Lease Financing	U.S. Small Business Commercial (2)
	December 31, 2017				
Risk ratings					
Pass rated	$ 275,904	$ 96,199	$ 57,732	$ 21,535	$ 322
Reservable criticized	8,932	1,593	566	581	50
Refreshed FICO score (3)					
Less than 620					223
Greater than or equal to 620 and less than 680					625
Greater than or equal to 680 and less than 740					1,875
Greater than or equal to 740					3,713
Other internal credit metrics (3, 4)					6,841
Total commercial	$ 284,836	$ 97,792	$ 58,298	$ 22,116	$ 13,649

(1) Excludes $4.8 billion of loans accounted for under the fair value option.
(2) U.S. small business commercial includes $709 million of criticized business card and small business loans which are evaluated using refreshed FICO scores or internal credit metrics, including delinquency status, rather than risk ratings. At December 31, 2017, 98 percent of the balances where internal credit metrics are used was current or less than 30 days past due.
(3) Refreshed FICO score and other internal credit metrics are applicable only to the U.S. small business commercial portfolio.
(4) Other internal credit metrics may include delinquency status, application scores, geography or other factors.

Impaired Loans and Troubled Debt Restructurings

A loan is considered impaired when, based on current information, it is probable that the Corporation will be unable to collect all amounts due from the borrower in accordance with the contractual terms of the loan. For more information, see *Note 1 – Summary of Significant Accounting Principles*.

Consumer Real Estate

Impaired consumer real estate loans within the Consumer Real Estate portfolio segment consist entirely of TDRs. Excluding PCI loans, most modifications of consumer real estate loans meet the definition of TDRs when a binding offer is extended to a borrower. Modifications of consumer real estate loans are done in accordance with government programs or the Corporation's proprietary programs. These modifications are considered to be TDRs if concessions have been granted to borrowers experiencing financial difficulties. Concessions may include reductions in interest rates, capitalization of past due amounts, principal and/or interest forbearance, payment extensions, principal and/or interest forgiveness, or combinations thereof.

Prior to permanently modifying a loan, the Corporation may enter into trial modifications with certain borrowers under both government and proprietary programs. Trial modifications generally represent a three- to four-month period during which the borrower makes monthly payments under the anticipated modified payment terms. Upon successful completion of the trial period, the Corporation and the borrower enter into a permanent modification. Binding trial modifications are classified as TDRs when the trial offer is made and continue to be classified as TDRs regardless of whether the borrower enters into a permanent modification.

Consumer real estate loans that have been discharged in Chapter 7 bankruptcy with no change in repayment terms and not reaffirmed by the borrower of $858 million were included in TDRs at December 31, 2018, of which $185 million were classified as nonperforming and $344 million were loans fully insured by the FHA. For more information on loans discharged in Chapter 7 bankruptcy, see Nonperforming Loans and Leases in this Note.

Consumer real estate TDRs are measured primarily based on the net present value of the estimated cash flows discounted at the loan's original effective interest rate. If the carrying value of a TDR exceeds this amount, a specific allowance is recorded as a component of the allowance for loan and lease losses. Alternatively, consumer real estate TDRs that are considered to be dependent solely on the collateral for repayment (e.g., due to the lack of income verification) are measured based on the estimated fair value of the collateral and a charge-off is recorded if the carrying value exceeds the fair value of the collateral. Consumer real estate loans that reached 180 days past due prior to modification had been charged off to their net realizable value, less costs to sell, before they were modified as TDRs in accordance with established policy. Therefore, modifications of consumer real estate loans that are 180 or more days past due as TDRs do not have an impact on the allowance for loan and lease losses nor are additional charge-offs required at the time of modification. Subsequent declines in the fair value of the collateral after a loan has reached 180 days past due are recorded as charge-offs. Fully-insured loans are protected against principal loss, and therefore, the Corporation does not record an allowance for loan and lease losses on the outstanding principal balance, even after they have been modified in a TDR.

At December 31, 2018 and 2017, remaining commitments to lend additional funds to debtors whose terms have been modified in a consumer real estate TDR were not significant. Consumer real estate foreclosed properties totaled $244 million and $236 million at December 31, 2018 and 2017. The carrying value of consumer real estate loans, including fully-insured and PCI loans, for which formal foreclosure proceedings were in process at December 31, 2018 was $2.5 billion. During 2018 and 2017, the Corporation reclassified $670 million and $815 million of consumer real estate loans to foreclosed properties or, for properties acquired upon foreclosure of certain government-guaranteed loans (principally FHA-insured loans), to other assets. The reclassifications represent non-cash investing activities and, accordingly, are not reflected in the Consolidated Statement of Cash Flows.

The following table provides the unpaid principal balance, carrying value and related allowance at December 31, 2018 and 2017, and the average carrying value and interest income recognized in 2018, 2017 and 2016 for impaired loans in the Corporation's Consumer Real Estate portfolio segment. Certain impaired consumer real estate loans do not have a related allowance as the current valuation of these impaired loans exceeded the carrying value, which is net of previously recorded charge-offs.

Impaired Loans – Consumer Real Estate

(Dollars in millions)		Unpaid Principal Balance		Carrying Value		Related Allowance		Unpaid Principal Balance		Carrying Value		Related Allowance
		December 31, 2018						December 31, 2017				
With no recorded allowance												
Residential mortgage	$	5,396	$	4,268	$	—	$	8,856	$	6,870	$	—
Home equity		2,948		1,599		—		3,622		1,956		—
With an allowance recorded												
Residential mortgage	$	1,977	$	1,929	$	114	$	2,908	$	2,828	$	174
Home equity		812		760		144		972		900		174
Total (1)												
Residential mortgage	$	7,373	$	6,197	$	114	$	11,764	$	9,698	$	174
Home equity		3,760		2,359		144		4,594		2,856		174

		Average Carrying Value		Interest Income Recognized (2)		Average Carrying Value		Interest Income Recognized (2)		Average Carrying Value		Interest Income Recognized (2)
		2018				2017				2016		
With no recorded allowance												
Residential mortgage	$	5,424	$	207	$	7,737	$	311	$	10,178	$	360
Home equity		1,894		105		1,997		109		1,906		90
With an allowance recorded												
Residential mortgage	$	2,409	$	91	$	3,414	$	123	$	5,067	$	167
Home equity		861		25		858		24		852		24
Total (1)												
Residential mortgage	$	7,833	$	298	$	11,151	$	434	$	15,245	$	527
Home equity		2,755		130		2,855		133		2,758		114

(1) During 2018, previously impaired consumer real estate loans with a carrying value of $2.3 billion were sold.
(2) Interest income recognized includes interest accrued and collected on the outstanding balances of accruing impaired loans as well as interest cash collections on nonaccruing impaired loans for which the principal is considered collectible.

The table below presents the December 31, 2018, 2017 and 2016 unpaid principal balance, carrying value, and average pre- and post-modification interest rates on consumer real estate loans that were modified in TDRs during 2018, 2017 and 2016. The following Consumer Real Estate portfolio segment tables include loans that were initially classified as TDRs during the period and also loans that had previously been classified as TDRs and were modified again during the period.

Consumer Real Estate – TDRs Entered into During 2018, 2017 and 2016

(Dollars in millions)		Unpaid Principal Balance		Carrying Value	Pre-Modification Interest Rate	Post-Modification Interest Rate (1)
				December 31, 2018		
Residential mortgage	$	774	$	641	4.33%	4.21%
Home equity		489		358	4.46	3.74
Total	$	1,263	$	999	4.38	4.03
				December 31, 2017		
Residential mortgage	$	824	$	712	4.43%	4.16%
Home equity		764		590	4.22	3.49
Total	$	1,588	$	1,302	4.33	3.83
				December 31, 2016		
Residential mortgage	$	1,130	$	1,017	4.73%	4.16%
Home equity		849		649	3.95	2.72
Total	$	1,979	$	1,666	4.40	3.54

(1) The post-modification interest rate reflects the interest rate applicable only to permanently completed modifications, which exclude loans that are in a trial modification period.

The table below presents the December 31, 2018, 2017 and 2016 carrying value for consumer real estate loans that were modified in a TDR during 2018, 2017 and 2016, by type of modification.

Consumer Real Estate – Modification Programs

	TDRs Entered into During		
(Dollars in millions)	2018	2017	2016
Modifications under government programs			
Contractual interest rate reduction	$ 19	$ 59	$ 151
Principal and/or interest forbearance	—	4	13
Other modifications (1)	42	22	23
Total modifications under government programs	61	85	187
Modifications under proprietary programs			
Contractual interest rate reduction	209	281	235
Capitalization of past due amounts	96	63	40
Principal and/or interest forbearance	51	38	72
Other modifications (1)	167	55	75
Total modifications under proprietary programs	523	437	422
Trial modifications	285	569	831
Loans discharged in Chapter 7 bankruptcy (2)	130	211	226
Total modifications	$ 999	$ 1,302	$ 1,666

(1) Includes other modifications such as term or payment extensions and repayment plans. During 2018, this included $198 million of modifications that met the definition of a TDR related to the 2017 hurricanes. These modifications had been written down to their net realizable value less costs to sell or were fully insured as of December 31, 2018.
(2) Includes loans discharged in Chapter 7 bankruptcy with no change in repayment terms that are classified as TDRs.

The table below presents the carrying value of consumer real estate loans that entered into payment default during 2018, 2017 and 2016 that were modified in a TDR during the 12 months preceding payment default. A payment default for consumer real estate TDRs is recognized when a borrower has missed three monthly payments (not necessarily consecutively) since modification.

Consumer Real Estate – TDRs Entering Payment Default that were Modified During the Preceding 12 Months

(Dollars in millions)	2018	2017	2016
Modifications under government programs	$ 39	$ 81	$ 262
Modifications under proprietary programs	158	138	196
Loans discharged in Chapter 7 bankruptcy (1)	64	116	158
Trial modifications (2)	107	391	824
Total modifications	$ 368	$ 726	$ 1,440

(1) Includes loans discharged in Chapter 7 bankruptcy with no change in repayment terms that are classified as TDRs.
(2) Includes trial modification offers to which the customer did not respond.

Credit Card and Other Consumer

Impaired loans within the Credit Card and Other Consumer portfolio segment consist entirely of loans that have been modified in TDRs. The Corporation seeks to assist customers that are experiencing financial difficulty by modifying loans while ensuring compliance with federal and local laws and guidelines. Credit card and other consumer loan modifications generally involve reducing the interest rate on the account, placing the customer on a fixed payment plan not exceeding 60 months and canceling the customer's available line of credit, all of which are considered TDRs. The Corporation makes loan modifications directly with borrowers for debt held only by the Corporation (internal programs). Additionally, the Corporation makes loan modifications for borrowers working with third-party renegotiation agencies that provide solutions to customers' entire unsecured debt structures (external programs). The Corporation classifies other secured consumer loans that have been discharged in Chapter 7 bankruptcy as TDRs which are written down to collateral value and placed on nonaccrual status no later than the time of discharge. For more information on the regulatory guidance on loans discharged in Chapter 7 bankruptcy, see Nonperforming Loans and Leases in this Note.

The table below provides the unpaid principal balance, carrying value and related allowance at December 31, 2018 and 2017, and the average carrying value for 2018, 2017 and 2016 on TDRs within the Credit Card and Other Consumer portfolio segment.

Impaired Loans – Credit Card and Other Consumer

(Dollars in millions)	Unpaid Principal Balance	Carrying Value (1)	Related Allowance	Unpaid Principal Balance	Carrying Value (1)	Related Allowance	Average Carrying Value (2)		
	December 31, 2018			December 31, 2017			2018	2017	2016
With no recorded allowance									
Direct/Indirect consumer	$ 72	$ 33	$ —	$ 58	$ 28	$ —	$ 30	$ 21	$ 20
With an allowance recorded									
U.S. credit card	$ 522	$ 533	$ 154	$ 454	$ 461	$ 125	$ 491	$ 464	$ 556
Non-U.S. credit card (3)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	47	111
Direct/Indirect consumer	—	—	—	1	1	—	1	2	10
Total									
U.S. credit card	$ 522	$ 533	$ 154	$ 454	$ 461	$ 125	$ 491	$ 464	$ 556
Non-U.S. credit card (3)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	47	111
Direct/Indirect consumer	72	33	—	59	29	—	31	23	30

(1) Includes accrued interest and fees.
(2) The related interest income recognized, which included interest accrued and collected on the outstanding balances of accruing impaired loans as well as interest cash collections on nonaccruing impaired loans for which the principal was considered collectible, was not significant in 2018, 2017 and 2016.
(3) In 2017, the Corporation sold its non-U.S. consumer credit card business.
n/a = not applicable

The table below provides information on the Corporation's primary modification programs for the Credit Card and Other Consumer TDR portfolio at December 31, 2018 and 2017.

Credit Card and Other Consumer – TDRs by Program Type at December 31

(Dollars in millions)	U.S. Credit Card 2018	U.S. Credit Card 2017	Direct/Indirect Consumer 2018	Direct/Indirect Consumer 2017	Total TDRs by Program Type 2018	Total TDRs by Program Type 2017
Internal programs	$ 259	$ 203	$ —	$ 1	$ 259	$ 204
External programs	273	257	—	—	273	257
Other	1	1	33	28	34	29
Total	$ 533	$ 461	$ 33	$ 29	$ 566	$ 490
Percent of balances current or less than 30 days past due	85%	87%	81%	88%	85%	87%

The table below provides information on the Corporation's Credit Card and Other Consumer TDR portfolio including the December 31, 2018, 2017 and 2016 unpaid principal balance, carrying value, and average pre- and post-modification interest rates of loans that were modified in TDRs during 2018, 2017 and 2016.

Credit Card and Other Consumer – TDRs Entered into During 2018, 2017 and 2016

(Dollars in millions)	Unpaid Principal Balance	Carrying Value (1)	Pre-Modification Interest Rate	Post-Modification Interest Rate
	December 31, 2018			
U.S. credit card	$ 278	$ 292	19.49%	5.24%
Direct/Indirect consumer	42	23	5.10	4.95
Total	$ 320	$ 315	18.45	5.22
	December 31, 2017			
U.S. credit card	$ 203	$ 213	18.47%	5.32%
Direct/Indirect consumer	37	22	4.81	4.30
Total	$ 240	$ 235	17.17	5.22
	December 31, 2016			
U.S. credit card	$ 163	$ 172	17.54%	5.47%
Non-U.S. credit card	66	75	23.99	0.52
Direct/Indirect consumer	21	13	3.44	3.29
Total	$ 250	$ 260	18.73	3.93

(1) Includes accrued interest and fees.

Credit card and other consumer loans are deemed to be in payment default during the quarter in which a borrower misses the second of two consecutive payments. Payment defaults are one of the factors considered when projecting future cash flows in the calculation of the allowance for loan and lease losses for impaired credit card and other consumer loans. Based on historical experience, the Corporation estimates that 13 percent of new U.S. credit card TDRs and 14 percent of new direct/indirect consumer TDRs may be in payment default within 12 months after modification.

Commercial Loans

Impaired commercial loans include nonperforming loans and TDRs (both performing and nonperforming). Modifications of loans to commercial borrowers that are experiencing financial difficulty are designed to reduce the Corporation's loss exposure while providing the borrower with an opportunity to work through financial difficulties, often to avoid foreclosure or bankruptcy. Each modification is unique and reflects the individual circumstances of the borrower. Modifications that result in a TDR may include extensions of maturity at a concessionary (below market) rate of interest, payment forbearances or other actions designed to benefit the customer while mitigating the Corporation's risk exposure. Reductions in interest rates are rare. Instead, the interest rates are typically increased, although the increased rate may not represent a market rate of interest. Infrequently, concessions may also include principal forgiveness in connection with foreclosure, short sale or other settlement agreements leading to termination or sale of the loan.

At the time of restructuring, the loans are remeasured to reflect the impact, if any, on projected cash flows resulting from the modified terms. If there was no forgiveness of principal and the interest rate was not decreased, the modification may have little or no impact on the allowance established for the loan. If a portion of the loan is deemed to be uncollectible, a charge-off may be recorded at the time of restructuring. Alternatively, a charge-off may have already been recorded in a previous period such that no charge-off is required at the time of modification. For more information on modifications for the U.S. small business commercial portfolio, see Credit Card and Other Consumer in this Note.

At December 31, 2018 and 2017, remaining commitments to lend additional funds to debtors whose terms have been modified in a commercial loan TDR were $297 million and $205 million.

The table below provides information on impaired loans in the Commercial loan portfolio segment including the unpaid principal balance, carrying value and related allowance at December 31, 2018 and 2017, and the average carrying value for 2018, 2017 and 2016. Certain impaired commercial loans do not have a related allowance because the valuation of these impaired loans exceeded the carrying value, which is net of previously recorded charge-offs.

Impaired Loans – Commercial

(Dollars in millions)	Unpaid Principal Balance	Carrying Value	Related Allowance	Unpaid Principal Balance	Carrying Value	Related Allowance	Average Carrying Value (1)		
	December 31, 2018			December 31, 2017			2018	2017	2016
With no recorded allowance									
U.S. commercial	$ 638	$ 616	$ —	$ 576	$ 571	$ —	$ 655	$ 772	$ 787
Non-U.S. commercial	93	93	—	14	11	—	43	46	34
Commercial real estate	—	—	—	83	80	—	44	69	67
Commercial lease financing	—	—	—	—	—	—	3	—	—
With an allowance recorded									
U.S. commercial	$ 1,437	$ 1,270	$ 121	$ 1,393	$ 1,109	$ 98	$ 1,162	$ 1,260	$ 1,569
Non-U.S. commercial	155	149	30	528	507	58	327	463	409
Commercial real estate	247	162	16	133	41	4	46	73	92
Commercial lease financing	71	71	—	20	18	3	42	8	2
U.S. small business commercial (2)	83	72	29	84	70	27	73	73	87
Total									
U.S. commercial	$ 2,075	$ 1,886	$ 121	$ 1,969	$ 1,680	$ 98	$ 1,817	$ 2,032	$ 2,356
Non-U.S. commercial	248	242	30	542	518	58	370	509	443
Commercial real estate	247	162	16	216	121	4	90	142	159
Commercial lease financing	71	71	—	20	18	3	45	8	2
U.S. small business commercial (2)	83	72	29	84	70	27	73	73	87

(1) The related interest income recognized, which included interest accrued and collected on the outstanding balances of accruing impaired loans as well as interest cash collections on nonaccruing impaired loans for which the principal was considered collectible, was not significant in 2018, 2017 and 2016.
(2) Includes U.S. small business commercial renegotiated TDR loans and related allowance.

The table below presents the December 31, 2018, 2017 and 2016 unpaid principal balance and carrying value of commercial loans that were modified as TDRs during 2018, 2017 and 2016. The table below includes loans that were initially classified as TDRs during the period and also loans that had previously been classified as TDRs and were modified again during the period.

Commercial – TDRs Entered into During 2018, 2017 and 2016

(Dollars in millions)	Unpaid Principal Balance	Carrying Value
	December 31, 2018	
U.S. commercial	**$ 1,154**	**$ 1,098**
Non-U.S. commercial	**166**	**165**
Commercial real estate	**115**	**115**
Commercial lease financing	**68**	**68**
U.S. small business commercial [(1)]	**9**	**8**
Total	**$ 1,512**	**$ 1,454**
	December 31, 2017	
U.S. commercial	$ 1,033	$ 922
Non-U.S. commercial	105	105
Commercial real estate	35	24
Commercial lease financing	20	17
U.S. small business commercial [(1)]	13	13
Total	$ 1,206	$ 1,081
	December 31, 2016	
U.S. commercial	$ 1,556	$ 1,482
Non-U.S. commercial	255	253
Commercial real estate	77	77
Commercial lease financing	6	4
U.S. small business commercial [(1)]	1	1
Total	$ 1,895	$ 1,817

(1) U.S. small business commercial TDRs are comprised of renegotiated small business card loans.

A commercial TDR is generally deemed to be in payment default when the loan is 90 days or more past due, including delinquencies that were not resolved as part of the modification. U.S. small business commercial TDRs are deemed to be in payment default during the quarter in which a borrower misses the second of two consecutive payments. Payment defaults are one of the factors considered when projecting future cash flows, along with observable market prices or fair value of collateral when measuring the allowance for loan and lease losses. TDRs that were in payment default had a carrying value of $150 million, $64 million and $140 million for U.S. commercial and $3 million, $19 million and $34 million for commercial real estate at December 31, 2018, 2017 and 2016, respectively.

Purchased Credit-impaired Loans

The table below shows activity for the accretable yield on PCI loans, which includes the Countrywide Financial Corporation (Countrywide) portfolio and loans repurchased in connection with the 2013 settlement with FNMA. The amount of accretable yield is affected by changes in credit outlooks, including metrics such as default rates and loss severities, prepayment speeds, which can change the amount and period of time over which interest payments are expected to be received, and the interest rates on variable rate loans. The reclassifications from nonaccretable difference during 2018 and 2017 were primarily due to an increase in the expected principal and interest cash flows due to lower default estimates and the rising interest rate environment.

Rollforward of Accretable Yield

(Dollars in millions)	
Accretable yield, January 1, 2017	$ 3,805
Accretion	(601)
Disposals/transfers	(634)
Reclassifications from nonaccretable difference	219
Accretable yield, December 31, 2017	2,789
Accretion	**(457)**
Disposals/transfers	**(1,456)**
Reclassifications from nonaccretable difference	**368**
Accretable yield, December 31, 2018	**$ 1,244**

During 2018 and 2017, the Corporation sold PCI loans with a carrying value of $4.4 billion and $803 million. For more information on PCI loans, see *Note 1 – Summary of Significant Accounting Principles* and for the carrying value and valuation allowance for PCI loans, see *Note 6 – Allowance for Credit Losses*.

Loans Held-for-sale

The Corporation had LHFS of $10.4 billion and $11.4 billion at December 31, 2018 and 2017. Cash and non-cash proceeds from sales and paydowns of loans originally classified as LHFS were $29.2 billion, $41.3 billion and $32.6 billion for 2018, 2017 and 2016, respectively. Cash used for originations and purchases of LHFS totaled $28.1 billion, $43.5 billion and $33.1 billion for 2018, 2017 and 2016, respectively.

NOTE 6 Allowance for Credit Losses

The table below summarizes the changes in the allowance for credit losses by portfolio segment for 2018, 2017 and 2016.

(Dollars in millions)	Consumer Real Estate [1]	Credit Card and Other Consumer	Commercial	Total
		2018		
Allowance for loan and lease losses, January 1	**$ 1,720**	**$ 3,663**	**$ 5,010**	**$ 10,393**
Loans and leases charged off	**(690)**	**(4,037)**	**(675)**	**(5,402)**
Recoveries of loans and leases previously charged off	**664**	**823**	**152**	**1,639**
Net charge-offs	**(26)**	**(3,214)**	**(523)**	**(3,763)**
Write-offs of PCI loans [2]	**(273)**	**—**	**—**	**(273)**
Provision for loan and lease losses	**(492)**	**3,441**	**313**	**3,262**
Other [3]	**(1)**	**(16)**	**(1)**	**(18)**
Allowance for loan and lease losses, December 31	**928**	**3,874**	**4,799**	**9,601**
Reserve for unfunded lending commitments, January 1	**—**	**—**	**777**	**777**
Provision for unfunded lending commitments	**—**	**—**	**20**	**20**
Reserve for unfunded lending commitments, December 31	**—**	**—**	**797**	**797**
Allowance for credit losses, December 31	**$ 928**	**$ 3,874**	**$ 5,596**	**$ 10,398**
		2017		
Allowance for loan and lease losses, January 1	$ 2,750	$ 3,229	$ 5,258	$ 11,237
Loans and leases charged off	(770)	(3,774)	(1,075)	(5,619)
Recoveries of loans and leases previously charged off	657	809	174	1,640
Net charge-offs	(113)	(2,965)	(901)	(3,979)
Write-offs of PCI loans [2]	(207)	—	—	(207)
Provision for loan and lease losses	(710)	3,437	654	3,381
Other [3]	—	(38)	(1)	(39)
Allowance for loan and lease losses, December 31	1,720	3,663	5,010	10,393
Reserve for unfunded lending commitments, January 1	—	—	762	762
Provision for unfunded lending commitments	—	—	15	15
Reserve for unfunded lending commitments, December 31	—	—	777	777
Allowance for credit losses, December 31	$ 1,720	$ 3,663	$ 5,787	$ 11,170
		2016		
Allowance for loan and lease losses, January 1	$ 3,914	$ 3,471	$ 4,849	$ 12,234
Loans and leases charged off	(1,155)	(3,553)	(740)	(5,448)
Recoveries of loans and leases previously charged off	619	770	238	1,627
Net charge-offs	(536)	(2,783)	(502)	(3,821)
Write-offs of PCI loans [2]	(340)	—	—	(340)
Provision for loan and lease losses	(258)	2,826	1,013	3,581
Other [3]	(30)	(42)	(102)	(174)
Total allowance for loan and lease losses, December 31	2,750	3,472	5,258	11,480
Less: Allowance included in assets of business held for sale [4]	—	(243)	—	(243)
Allowance for loan and lease losses, December 31	2,750	3,229	5,258	11,237
Reserve for unfunded lending commitments, January 1	—	—	646	646
Provision for unfunded lending commitments	—	—	16	16
Other [3]	—	—	100	100
Reserve for unfunded lending commitments, December 31	—	—	762	762
Allowance for credit losses, December 31	$ 2,750	$ 3,229	$ 6,020	$ 11,999

(1) Includes valuation allowance associated with the PCI loan portfolio.
(2) Includes write-offs associated with the sale of PCI loans of $167 million, $87 million and $60 million in 2018, 2017 and 2016, respectively.
(3) Primarily represents the net impact of portfolio sales, consolidations and deconsolidations, foreign currency translation adjustments, transfers to held for sale and certain other reclassifications.
(4) Represents allowance for loan and lease losses related to the non-U.S. consumer credit card loan portfolio, which was sold in 2017.

The table below presents the allowance and the carrying value of outstanding loans and leases by portfolio segment at December 31, 2018 and 2017.

Allowance and Carrying Value by Portfolio Segment

(Dollars in millions)	Consumer Real Estate	Credit Card and Other Consumer	Commercial	Total
	December 31, 2018			
Impaired loans and troubled debt restructurings [1]				
Allowance for loan and lease losses	$ 258	$ 154	$ 196	$ 608
Carrying value [2]	8,556	566	2,433	11,555
Allowance as a percentage of carrying value	3.02%	27.21%	8.06%	5.26%
Loans collectively evaluated for impairment				
Allowance for loan and lease losses	$ 579	$ 3,720	$ 4,603	$ 8,902
Carrying value [2, 3]	243,642	189,140	493,564	926,346
Allowance as a percentage of carrying value [3]	0.24%	1.97%	0.93%	0.96%
Purchased credit-impaired loans				
Valuation allowance	$ 91	n/a	n/a	$ 91
Carrying value gross of valuation allowance	4,645	n/a	n/a	4,645
Valuation allowance as a percentage of carrying value	1.96%	n/a	n/a	1.96%
Total				
Allowance for loan and lease losses	$ 928	$ 3,874	$ 4,799	$ 9,601
Carrying value [2, 3]	256,843	189,706	495,997	942,546
Allowance as a percentage of carrying value [3]	0.36%	2.04%	0.97%	1.02%
	December 31, 2017			
Impaired loans and troubled debt restructurings [1]				
Allowance for loan and lease losses	$ 348	$ 125	$ 190	$ 663
Carrying value [2]	12,554	490	2,407	15,451
Allowance as a percentage of carrying value	2.77%	25.51%	7.89%	4.29%
Loans collectively evaluated for impairment				
Allowance for loan and lease losses	$ 1,083	$ 3,538	$ 4,820	$ 9,441
Carrying value [2, 3]	238,284	192,303	474,284	904,871
Allowance as a percentage of carrying value [3]	0.45%	1.84%	1.02%	1.04%
Purchased credit-impaired loans				
Valuation allowance	$ 289	n/a	n/a	$ 289
Carrying value gross of valuation allowance	10,717	n/a	n/a	10,717
Valuation allowance as a percentage of carrying value	2.70%	n/a	n/a	2.70%
Total				
Allowance for loan and lease losses	$ 1,720	$ 3,663	$ 5,010	$ 10,393
Carrying value [2, 3]	261,555	192,793	476,691	931,039
Allowance as a percentage of carrying value [3]	0.66%	1.90%	1.05%	1.12%

(1) Impaired loans include nonperforming commercial loans and all TDRs, including both commercial and consumer TDRs. Impaired loans exclude nonperforming consumer loans unless they are TDRs, and all consumer and commercial loans accounted for under the fair value option.
(2) Amounts are presented gross of the allowance for loan and lease losses.
(3) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $4.3 billion and $5.7 billion at December 31, 2018 and 2017.
n/a = not applicable

NOTE 7 Securitizations and Other Variable Interest Entities

The Corporation utilizes VIEs in the ordinary course of business to support its own and its customers' financing and investing needs. The Corporation routinely securitizes loans and debt securities using VIEs as a source of funding for the Corporation and as a means of transferring the economic risk of the loans or debt securities to third parties. The assets are transferred into a trust or other securitization vehicle such that the assets are legally isolated from the creditors of the Corporation and are not available to satisfy its obligations. These assets can only be used to settle obligations of the trust or other securitization vehicle. The Corporation also administers, structures or invests in other VIEs including CDOs, investment vehicles and other entities. For more information on the Corporation's use of VIEs, see *Note 1 – Summary of Significant Accounting Principles.*

The tables in this Note present the assets and liabilities of consolidated and unconsolidated VIEs at December 31, 2018 and 2017 in situations where the Corporation has continuing involvement with transferred assets or if the Corporation otherwise has a variable interest in the VIE. The tables also present the Corporation's maximum loss exposure at December 31, 2018 and 2017 resulting from its involvement with consolidated VIEs and unconsolidated VIEs in which the Corporation holds a variable interest. The Corporation's maximum loss exposure is based on the unlikely event that all of the assets in the VIEs become worthless and incorporates not only potential losses associated with assets recorded on the Consolidated Balance Sheet but also potential losses associated with off-balance sheet commitments, such as unfunded liquidity commitments and other contractual arrangements. The Corporation's maximum loss exposure does not include losses previously recognized through write-downs of assets.

The Corporation invests in ABS issued by third-party VIEs with which it has no other form of involvement and enters into certain commercial lending arrangements that may also incorporate the use of VIEs, for example to hold collateral. These securities and loans are included in *Note 4 – Securities* or *Note 5 – Outstanding Loans and Leases.* In addition, the Corporation has used VIEs such as trust preferred securities trusts in connection with its funding activities. In 2018, the Corporation redeemed trust preferred securities with a total carrying value of $3.1 billion resulting in the extinguishment of the related junior subordinated notes issued by the Corporation. In connection therewith, the Corporation recorded a charge to other income of $729 million primarily due to the difference between the carrying and redemption values of the trust preferred securities, the majority of which relates to the discount on the junior subordinated notes resulting from prior acquisitions. For more information on trust preferred securities, see *Note 11 – Long-term Debt.* These VIEs, which are generally not consolidated by the Corporation, as applicable, are not included in the tables herein.

The Corporation did not provide financial support to consolidated or unconsolidated VIEs during 2018, 2017 and 2016 that it was not previously contractually required to provide, nor does it intend to do so.

The Corporation had liquidity commitments, including written put options and collateral value guarantees, with certain unconsolidated VIEs of $218 million and $442 million at December 31, 2018 and 2017.

First-lien Mortgage Securitizations

As part of its mortgage banking activities, the Corporation securitizes a portion of the first-lien residential mortgage loans it originates or purchases from third parties, generally in the form of RMBS guaranteed by government-sponsored enterprises, FNMA and FHLMC (collectively the GSEs), or the Government National Mortgage Association (GNMA) primarily in the case of FHA-insured and U.S. Department of Veterans Affairs (VA)-guaranteed mortgage loans. Securitization usually occurs in conjunction with or shortly after origination or purchase, and the Corporation may also securitize loans held in its residential mortgage portfolio. In addition, the Corporation may, from time to time, securitize commercial mortgages it originates or purchases from other entities. The Corporation typically services the loans it securitizes. Further, the Corporation may retain beneficial interests in the securitization trusts including senior and subordinate securities and equity tranches issued by the trusts. Except as described in *Note 12 – Commitments and Contingencies*, the Corporation does not provide guarantees or recourse to the securitization trusts other than standard representations and warranties.

The table below summarizes select information related to first-lien mortgage securitizations for 2018, 2017 and 2016.

First-lien Mortgage Securitizations

	Residential Mortgage - Agency			Commercial Mortgage		
(Dollars in millions)	**2018**	2017	2016	**2018**	2017	2016
Cash proceeds from new securitizations (1)	**$ 5,369**	$ 14,467	$ 24,201	**$ 6,713**	$ 5,641	$ 3,887
Gains on securitizations (2)	**62**	158	370	**101**	91	38
Repurchases from securitization trusts (3)	**1,485**	2,713	3,611	**—**	—	—

(1) The Corporation transfers residential mortgage loans to securitizations sponsored by the GSEs or GNMA in the normal course of business and receives RMBS in exchange which may then be sold into the market to third-party investors for cash proceeds.

(2) A majority of the first-lien residential mortgage loans securitized are initially classified as LHFS and accounted for under the fair value option. Gains recognized on these LHFS prior to securitization, which totaled $71 million, $243 million and $487 million, net of hedges, during 2018, 2017 and 2016, respectively, are not included in the table above.

(3) The Corporation may have the option to repurchase delinquent loans out of securitization trusts, which reduces the amount of servicing advances it is required to make. The Corporation may also repurchase loans from securitization trusts to perform modifications. Repurchased loans include FHA-insured mortgages collateralizing GNMA securities.

In addition to cash proceeds as reported in the table above, the Corporation received securities with an initial fair value of $711 million, $1.9 billion and $4.2 billion in connection with first-lien mortgage securitizations in 2018, 2017 and 2016, respectively. Substantially all of these securities are classified as Level 2 assets within the fair value hierarchy.

The Corporation recognizes consumer MSRs from the sale or securitization of consumer real estate loans. The unpaid principal balance of loans serviced for investors, including residential mortgage and home equity loans, totaled $226.6 billion and $277.6 billion at December 31, 2018 and 2017. Servicing fee and ancillary fee income on serviced loans was $710 million, $893 million and $1.2 billion in 2018, 2017 and 2016, respectively. Servicing advances on serviced loans, including loans serviced for others and loans held for investment, were $3.3 billion and $4.5 billion at December 31, 2018 and 2017. For more information on MSRs, see *Note 20 – Fair Value Measurements*.

There were no significant deconsolidations of agency residential mortgage securitizations in 2018 or 2017. During 2016, the Corporation deconsolidated agency residential mortgage securitization vehicles with total assets of $3.8 billion and total liabilities of $628 million following the sale of retained interests to third parties, after which the Corporation no longer had the unilateral ability to liquidate the vehicles. Of the balances deconsolidated in 2016, $706 million of assets and $628 million of liabilities represent non-cash investing and financing activities and, accordingly, are not reflected on the Consolidated Statement of Cash Flows. A gain on sale of $125 million in 2016 related to the deconsolidation was recorded in other income in the Consolidated Statement of Income.

The following table summarizes select information related to first-lien mortgage securitization trusts in which the Corporation held a variable interest at December 31, 2018 and 2017.

First-lien Mortgage VIEs

	Residential Mortgage									
			Non-agency							
	Agency		Prime		Subprime		Alt-A		Commercial Mortgage	
	December 31									
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017	**2018**	2017	**2018**	2017
Unconsolidated VIEs										
Maximum loss exposure [(1)]	**$ 16,011**	$ 19,110	**$ 448**	$ 689	**$ 1,897**	$ 2,643	**$ 217**	$ 403	**$ 767**	$ 585
On-balance sheet assets										
Senior securities:										
Trading account assets	**$ 460**	$ 716	**$ 30**	$ 6	**$ 36**	$ 10	**$ 90**	$ 50	**$ 97**	$ 108
Debt securities carried at fair value	**9,381**	15,036	**246**	477	**1,470**	2,221	**125**	351	**—**	—
Held-to-maturity securities	**6,170**	3,348	**—**	—	**—**	—	**—**	—	**528**	274
All other assets	**—**	10	**3**	5	**37**	38	**2**	2	**40**	88
Total retained positions	**$ 16,011**	$ 19,110	**$ 279**	$ 488	**$ 1,543**	$ 2,269	**$ 217**	$ 403	**$ 665**	$ 470
Principal balance outstanding [(2)]	**$ 187,512**	$ 232,761	**$ 8,954**	$ 10,549	**$ 8,719**	$ 10,254	**$ 23,467**	$ 28,129	**$ 43,593**	$ 26,504
Consolidated VIEs										
Maximum loss exposure [(1)]	**$ 13,296**	$ 14,502	**$ 7**	$ 571	**$ —**	$ —	**$ —**	$ —	**$ 76**	$ —
On-balance sheet assets										
Trading account assets	**$ 1,318**	$ 232	**$ 150**	$ 571	**$ —**	$ —	**$ —**	$ —	**$ 76**	$ —
Loans and leases, net	**11,858**	14,030	**—**	—	**—**	—	**—**	—	**—**	—
All other assets	**143**	240	**—**	—	**—**	—	**—**	—	**—**	—
Total assets	**$ 13,319**	$ 14,502	**$ 150**	$ 571	**$ —**	$ —	**$ —**	$ —	**$ 76**	$ —
Total liabilities	**$ 26**	$ 3	**$ 143**	$ —	**$ —**	$ —	**$ —**	$ —	**$ —**	$ —

(1) Maximum loss exposure includes obligations under loss-sharing reinsurance and other arrangements for non-agency residential mortgage and commercial mortgage securitizations, but excludes the reserve for representations and warranties obligations and corporate guarantees and also excludes servicing advances and other servicing rights and obligations. For additional information, see *Note 12 – Commitments and Contingencies* and *Note 20 – Fair Value Measurements*.

(2) Principal balance outstanding includes loans where the Corporation was the transferor to securitization VIEs with which it has continuing involvement, which may include servicing the loans.

Other Asset-backed Securitizations

The table below summarizes select information related to home equity, credit card and other asset-backed VIEs in which the Corporation held a variable interest at December 31, 2018 and 2017.

Home Equity Loan, Credit Card and Other Asset-backed VIEs

	Home Equity [(1)]		Credit Card [(2, 3)]		Resecuritization Trusts		Municipal Bond Trusts	
	December 31							
(Dollars in millions)	**2018**	2017	**2018**	2017	**2018**	2017	**2018**	2017
Unconsolidated VIEs								
Maximum loss exposure	**$ 908**	$ 1,522	**$ —**	$ —	**$ 7,647**	$ 8,204	**$ 2,150**	$ 1,631
On-balance sheet assets								
Senior securities [(4)]:								
Trading account assets	**$ —**	$ —	**$ —**	$ —	**$ 1,419**	$ 869	**$ 26**	$ 33
Debt securities carried at fair value	**27**	36	**—**	—	**1,337**	1,661	**—**	—
Held-to-maturity securities	**—**	—	**—**	—	**4,891**	5,644	**—**	—
All other assets [(4)]	**—**	—	**—**	—	**—**	30	**—**	—
Total retained positions	**$ 27**	$ 36	**$ —**	$ —	**$ 7,647**	$ 8,204	**$ 26**	$ 33
Total assets of VIEs [(5)]	**$ 1,813**	$ 2,432	**$ —**	$ —	**$ 16,949**	$ 19,281	**$ 2,829**	$ 2,287
Consolidated VIEs								
Maximum loss exposure	**$ 85**	$ 112	**$ 18,800**	$ 24,337	**$ 128**	$ 628	**$ 1,540**	$ 1,453
On-balance sheet assets								
Trading account assets	**$ —**	$ —	**$ —**	$ —	**$ 366**	$ 1,557	**$ 1,553**	$ 1,452
Loans and leases	**133**	177	**29,906**	32,554	**—**	—	**—**	—
Allowance for loan and lease losses	**(5)**	(9)	**(901)**	(988)	**—**	—	**—**	—
All other assets	**4**	6	**136**	1,385	**—**	—	**1**	1
Total assets	**$ 132**	$ 174	**$ 29,141**	$ 32,951	**$ 366**	$ 1,557	**$ 1,554**	$ 1,453
On-balance sheet liabilities								
Short-term borrowings	**$ —**	$ —	**$ —**	$ —	**$ —**	$ —	**$ 742**	$ 312
Long-term debt	**55**	76	**10,321**	8,598	**238**	929	**12**	—
All other liabilities	**—**	—	**20**	16	**—**	—	**—**	—
Total liabilities	**$ 55**	$ 76	**$ 10,341**	$ 8,614	**$ 238**	$ 929	**$ 754**	$ 312

(1) For unconsolidated home equity loan VIEs, the maximum loss exposure includes outstanding trust certificates issued by trusts in rapid amortization, net of recorded reserves. For both consolidated and unconsolidated home equity loan VIEs, the maximum loss exposure excludes the reserve for representations and warranties obligations and corporate guarantees. For additional information, see *Note 12 – Commitments and Contingencies*.

(2) At December 31, 2018 and 2017, loans and leases in the consolidated credit card trust included $11.0 billion and $15.6 billion of seller's interest.

(3) At December 31, 2018 and 2017, all other assets in the consolidated credit card trust included certain short-term investments and unbilled accrued interest and fees.

(4) All other assets includes subordinate securities. The retained senior and subordinate securities were valued using quoted market prices or observable market inputs (Level 2 of the fair value hierarchy).

(5) Total assets of VIEs includes loans the Corporation transferred with which it has continuing involvement, which may include servicing the loan.

Home Equity Loans

The Corporation retains interests in home equity securitization trusts, primarily senior securities, to which it transferred home equity loans. In addition, the Corporation may be obligated to provide subordinate funding to the trusts during a rapid amortization event. This obligation is included in the maximum loss exposure in the table above. The charges that will ultimately be recorded as a result of the rapid amortization events depend on the undrawn portion of the home equity lines of credit (HELOCs), performance of the loans, the amount of subsequent draws and the timing of related cash flows.

Credit Card Securitizations

The Corporation securitizes originated and purchased credit card loans. The Corporation's continuing involvement with the securitization trust includes servicing the receivables, retaining an undivided interest (seller's interest) in the receivables, and holding certain retained interests including subordinate interests in accrued interest and fees on the securitized receivables and cash reserve accounts.

During 2018, 2017 and 2016, new senior debt securities issued to third-party investors from the credit card securitization trust were $4.0 billion, $3.1 billion and $750 million, respectively.

At December 31, 2018 and 2017, the Corporation held subordinate securities issued by the credit card securitization trust with a notional principal amount of $7.7 billion and $7.4 billion. These securities serve as a form of credit enhancement to the senior debt securities and have a stated interest rate of zero percent. During 2018, 2017 and 2016, the credit card securitization trust issued $650 million, $500 million and $121 million, respectively, of these subordinate securities.

Resecuritization Trusts

The Corporation transfers securities, typically MBS, into resecuritization VIEs at the request of customers seeking securities with specific characteristics. Generally, there are no significant ongoing activities performed in a resecuritization trust, and no single investor has the unilateral ability to liquidate the trust.

The Corporation resecuritized $22.8 billion, $25.1 billion and $23.4 billion of securities in 2018, 2017 and 2016, respectively. Securities transferred into resecuritization VIEs were measured at fair value with changes in fair value recorded in trading account profits prior to the resecuritization and no gain or loss on sale was recorded. During 2018, 2017 and 2016, resecuritization proceeds included securities with an initial fair value of $4.1 billion, $3.3 billion and $3.3 billion, respectively. Substantially all of the other securities received as resecuritization proceeds were classified as trading securities and were categorized as Level 2 within the fair value hierarchy.

Municipal Bond Trusts

The Corporation administers municipal bond trusts that hold highly-rated, long-term, fixed-rate municipal bonds. The trusts obtain financing by issuing floating-rate trust certificates that reprice on a weekly or other short-term basis to third-party investors.

The Corporation's liquidity commitments to unconsolidated municipal bond trusts, including those for which the Corporation was transferor, totaled $2.1 billion and $1.6 billion at December 31, 2018 and 2017. The weighted-average remaining life of bonds held in the trusts at December 31, 2018 was 7.3 years. There were no material write-downs or downgrades of assets or issuers during 2018, 2017 and 2016.

Other Variable Interest Entities

The table below summarizes select information related to other VIEs in which the Corporation held a variable interest at December 31, 2018 and 2017.

Other VIEs

	Consolidated	Unconsolidated	Total	Consolidated	Unconsolidated	Total
	December 31					
(Dollars in millions)	2018			2017		
Maximum loss exposure	**$ 4,177**	**$ 24,498**	**$ 28,675**	$ 4,660	$ 19,785	$ 24,445
On-balance sheet assets						
Trading account assets	**$ 2,335**	**$ 860**	**$ 3,195**	$ 2,709	$ 346	$ 3,055
Debt securities carried at fair value	**—**	**84**	**84**	—	160	160
Loans and leases	**1,949**	**3,940**	**5,889**	2,152	3,596	5,748
Allowance for loan and lease losses	**(2)**	**(30)**	**(32)**	(3)	(32)	(35)
All other assets	**53**	**18,885**	**18,938**	89	15,216	15,305
Total	**$ 4,335**	**$ 23,739**	**$ 28,074**	$ 4,947	$ 19,286	$ 24,233
On-balance sheet liabilities						
Long-term debt	**$ 152**	**$ —**	**$ 152**	$ 270	$ —	$ 270
All other liabilities	**7**	**4,231**	**4,238**	18	3,417	3,435
Total	**$ 159**	**$ 4,231**	**$ 4,390**	$ 288	$ 3,417	$ 3,705
Total assets of VIEs	**$ 4,335**	**$ 94,746**	**$ 99,081**	$ 4,947	$ 69,746	$ 74,693

Customer VIEs

Customer VIEs include credit-linked, equity-linked and commodity-linked note VIEs, repackaging VIEs and asset acquisition VIEs, which are typically created on behalf of customers who wish to obtain market or credit exposure to a specific company, index, commodity or financial instrument.

The Corporation's maximum loss exposure to consolidated and unconsolidated customer VIEs totaled $2.1 billion and $2.3 billion at December 31, 2018 and 2017, including the notional amount of derivatives to which the Corporation is a counterparty, net of losses previously recorded, and the Corporation's investment, if any, in securities issued by the VIEs.

Collateralized Debt Obligation VIEs

The Corporation receives fees for structuring CDO VIEs, which hold diversified pools of fixed-income securities, typically corporate debt or ABS, which the CDO VIEs fund by issuing multiple tranches of debt and equity securities. CDOs are generally managed by third-party portfolio managers. The Corporation typically transfers assets to these CDOs, holds securities issued by the CDOs and may be a derivative counterparty to the CDOs. The Corporation's maximum loss exposure to consolidated and unconsolidated CDOs totaled $421 million and $358 million at December 31, 2018 and 2017.

Investment VIEs

The Corporation sponsors, invests in or provides financing, which may be in connection with the sale of assets, to a variety of investment VIEs that hold loans, real estate, debt securities or other financial instruments and are designed to provide the desired investment profile to investors or the Corporation. At December 31, 2018 and 2017, the Corporation's consolidated investment VIEs had total assets of $270 million and $249 million. The Corporation also held investments in unconsolidated VIEs with total assets of $37.7 billion and $20.3 billion at December 31, 2018 and 2017. The Corporation's maximum loss exposure associated with both consolidated and unconsolidated investment VIEs totaled $7.2 billion and $5.7 billion at December 31, 2018 and 2017 comprised primarily of on-balance sheet assets less non-recourse liabilities.

Leveraged Lease Trusts

The Corporation's net investment in consolidated leveraged lease trusts totaled $1.8 billion and $2.0 billion at December 31, 2018 and 2017. The trusts hold long-lived equipment such as rail cars, power generation and distribution equipment, and commercial aircraft. The Corporation structures the trusts and holds a significant residual interest. The net investment represents the Corporation's maximum loss exposure to the trusts in the unlikely event that the leveraged lease investments become worthless. Debt issued by the leveraged lease trusts is non-recourse to the Corporation.

Tax Credit VIEs

The Corporation holds investments in unconsolidated limited partnerships and similar entities that construct, own and operate affordable housing, wind and solar projects. An unrelated third party is typically the general partner or managing member and has control over the significant activities of the VIE. The Corporation earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure included in the Other VIEs table was $17.0 billion and $13.8 billion at December 31, 2018 and 2017. The Corporation's risk of loss is generally mitigated by policies requiring that the project qualify for the expected tax credits prior to making its investment.

The Corporation's investments in affordable housing partnerships, which are reported in other assets on the Consolidated Balance Sheet, totaled $8.9 billion and $8.0 billion, including unfunded commitments to provide capital contributions of $3.8 billion and $3.1 billion at December 31, 2018 and 2017. The unfunded commitments are expected to be paid over the next five years. During 2018, 2017 and 2016, the Corporation recognized tax credits and other tax benefits from investments in affordable housing partnerships of $981 million, $1.0 billion and $1.1 billion and reported pretax losses in other income of $798 million, $766 million and $789 million, respectively. Tax credits are recognized as part of the Corporation's annual effective tax rate used to determine tax expense in a given quarter. Accordingly, the portion of a year's expected tax benefits recognized in any given quarter may differ from 25 percent. The Corporation may from time to time be asked to invest additional amounts to support a troubled affordable housing project. Such additional investments have not been and are not expected to be significant.

NOTE 8 Goodwill and Intangible Assets

Goodwill

The table below presents goodwill balances by reporting unit and *All Other* at December 31, 2018 and 2017. The reporting units utilized for goodwill impairment testing are the operating segments or one level below.

Goodwill

(Dollars in millions)	December 31 2018	December 31 2017
Deposits	$ 18,414	$ 18,414
Consumer Lending	11,709	11,709
Consumer Banking	**30,123**	30,123
U.S. Trust	2,917	2,917
Merrill Lynch Global Wealth Management	6,760	6,760
Global Wealth & Investment Management	**9,677**	9,677
Global Commercial Banking	16,146	16,146
Global Corporate and Investment Banking	6,231	6,231
Business Banking	1,546	1,546
Global Banking	**23,923**	23,923
Global Markets	**5,182**	5,182
All Other	**46**	46
Total goodwill	**$ 68,951**	$ 68,951

During 2018, the Corporation completed its annual goodwill impairment test as of June 30, 2018 using qualitative assessments for all applicable reporting units. Based on the results of the annual goodwill impairment test, the Corporation determined there was no impairment. For more information on the use of qualitative assessments, see *Note 1 – Summary of Significant Accounting Principles*.

Intangible Assets

The table below presents the gross and net carrying values and accumulated amortization for intangible assets at December 31, 2018 and 2017.

Intangible Assets (1, 2)

(Dollars in millions)	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
	December 31, 2018			December 31, 2017		
Purchased credit card and affinity relationships	**$ 5,919**	**$ 5,759**	**$ 160**	$ 5,919	$ 5,604	$ 315
Core deposit and other intangibles (3)	**3,835**	**2,221**	**1,614**	3,835	2,140	1,695
Customer relationships	**—**	**—**	**—**	3,886	3,584	302
Total intangible assets	**$ 9,754**	**$ 7,980**	**$ 1,774**	$ 13,640	$ 11,328	$ 2,312

(1) Excludes fully amortized intangible assets.
(2) At December 31, 2018 and 2017, none of the intangible assets were impaired.
(3) Includes $1.6 billion at both December 31, 2018 and 2017 of intangible assets associated with trade names that have an indefinite life and, accordingly, are not amortized.

Amortization of intangibles expense was $538 million, $621 million and $730 million for 2018, 2017 and 2016, respectively. The Corporation estimates aggregate amortization expense will be $105 million for 2019, $55 million for 2020 and none for the years thereafter.

NOTE 9 Deposits

The table below presents information about the Corporation's time deposits of $100 thousand or more at December 31, 2018 and 2017. The Corporation also had aggregate time deposits of $16.4 billion and $17.0 billion in denominations that met or exceeded the Federal Deposit Insurance Corporation (FDIC) insurance limit at December 31, 2018 and 2017.

Time Deposits of $100 Thousand or More

(Dollars in millions)	Three Months or Less	Over Three Months to Twelve Months	Thereafter	Total	Total
	December 31, 2018				December 31 2017
U.S. certificates of deposit and other time deposits	**$ 14,441**	**$ 11,855**	**$ 3,209**	**$ 29,505**	$ 25,192
Non-U.S. certificates of deposit and other time deposits	**7,317**	**2,655**	**820**	**10,792**	15,472

The scheduled contractual maturities for total time deposits at December 31, 2018 are presented in the table below.

Contractual Maturities of Total Time Deposits

(Dollars in millions)	U.S.	Non-U.S.	Total
Due in 2019	$ 43,452	$ 10,030	**$ 53,482**
Due in 2020	4,580	164	**4,744**
Due in 2021	725	8	**733**
Due in 2022	560	11	**571**
Due in 2023	270	632	**902**
Thereafter	570	37	**607**
Total time deposits	$ 50,157	$ 10,882	**$ 61,039**

NOTE 10 Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash

The table below presents federal funds sold or purchased, securities financing agreements (which include securities borrowed or purchased under agreements to resell and securities loaned or sold under agreements to repurchase) and short-term borrowings. The Corporation elects to account for certain securities financing agreements and short-term borrowings under the fair value option. For more information on the fair value option, see *Note 21 – Fair Value Option*.

(Dollars in millions)	Amount	Rate	Amount	Rate
	2018		2017	
Federal funds sold and securities borrowed or purchased under agreements to resell				
Average during year	**$ 251,328**	**1.26%**	$ 222,818	0.81%
Maximum month-end balance during year	**279,350**	**n/a**	237,064	n/a
Federal funds purchased and securities loaned or sold under agreements to repurchase				
Average during year	**$ 193,681**	**1.80%**	$ 199,501	1.30%
Maximum month-end balance during year	**201,089**	**n/a**	218,017	n/a
Short-term borrowings				
Average during year	**36,021**	**2.69**	37,337	2.48
Maximum month-end balance during year	**52,480**	**n/a**	46,202	n/a

n/a = not applicable

Bank of America, N.A. maintains a global program to offer up to a maximum of $75 billion outstanding at any one time, of bank notes with fixed or floating rates and maturities of at least seven days from the date of issue. Short-term bank notes outstanding under this program totaled $12.1 billion and $14.2 billion at December 31, 2018 and 2017. These short-term bank notes, along with FHLB advances, U.S. Treasury tax and loan notes, and term federal funds purchased, are included in short-term borrowings on the Consolidated Balance Sheet.

Offsetting of Securities Financing Agreements

The Corporation enters into securities financing agreements to accommodate customers (also referred to as "matched-book transactions"), obtain securities to cover short positions, and to finance inventory positions. Substantially all of the Corporation's securities financing activities are transacted under legally enforceable master repurchase agreements or legally enforceable master securities lending agreements that give the Corporation, in the event of default by the counterparty, the right to liquidate securities held and to offset receivables and payables with the same counterparty. The Corporation offsets securities financing transactions with the same counterparty on the Consolidated Balance Sheet where it has such a legally enforceable master netting agreement and the transactions have the same maturity date.

The Securities Financing Agreements table presents securities financing agreements included on the Consolidated Balance Sheet in federal funds sold and securities borrowed or purchased under agreements to resell, and in federal funds purchased and securities loaned or sold under agreements to repurchase at December 31, 2018 and 2017. Balances are presented on a gross basis, prior to the application of counterparty netting. Gross assets and liabilities are adjusted on an aggregate basis to take into consideration the effects of legally enforceable master netting agreements. For more information on the offsetting of derivatives, see *Note 3 – Derivatives*.

Securities Financing Agreements

(Dollars in millions)	Gross Assets/ Liabilities [1]	Amounts Offset	Net Balance Sheet Amount	Financial Instruments [2]	Net Assets/ Liabilities
	December 31, 2018				
Securities borrowed or purchased under agreements to resell [3]	**$ 366,274**	**$ (106,865)**	**$ 259,409**	**$ (240,790)**	**$ 18,619**
Securities loaned or sold under agreements to repurchase	**$ 293,853**	**$ (106,865)**	**$ 186,988**	**$ (176,740)**	**$ 10,248**
Other [4]	**19,906**	**—**	**19,906**	**(19,906)**	**—**
Total	**$ 313,759**	**$ (106,865)**	**$ 206,894**	**$ (196,646)**	**$ 10,248**
	December 31, 2017				
Securities borrowed or purchased under agreements to resell [3]	$ 348,472	$ (135,725)	$ 212,747	$ (165,720)	$ 47,027
Securities loaned or sold under agreements to repurchase	$ 312,582	$ (135,725)	$ 176,857	$ (146,205)	$ 30,652
Other [4]	22,711	—	22,711	(22,711)	—
Total	$ 335,293	$ (135,725)	$ 199,568	$ (168,916)	$ 30,652

(1) Includes activity where uncertainty exists as to the enforceability of certain master netting agreements under bankruptcy laws in some countries or industries.
(2) Includes securities collateral received or pledged under repurchase or securities lending agreements where there is a legally enforceable master netting agreement. These amounts are not offset on the Consolidated Balance Sheet, but are shown as a reduction to derive a net asset or liability. Securities collateral received or pledged where the legal enforceability of the master netting agreements is uncertain is excluded from the table.
(3) Excludes repurchase activity of $11.5 billion and $10.2 billion reported in loans and leases on the Consolidated Balance Sheet at December 31, 2018 and 2017.
(4) Balance is reported in accrued expenses and other liabilities on the Consolidated Balance Sheet and relates to transactions where the Corporation acts as the lender in a securities lending agreement and receives securities that can be pledged as collateral or sold. In these transactions, the Corporation recognizes an asset at fair value, representing the securities received, and a liability, representing the obligation to return those securities.

Repurchase Agreements and Securities Loaned Transactions Accounted for as Secured Borrowings

The following tables present securities sold under agreements to repurchase and securities loaned by remaining contractual term to maturity and class of collateral pledged. Included in "Other" are transactions where the Corporation acts as the lender in a securities lending agreement and receives securities that can be pledged as collateral or sold. Certain agreements contain a right to substitute collateral and/or terminate the agreement prior to maturity at the option of the Corporation or the counterparty. Such agreements are included in the table below based on the remaining contractual term to maturity.

Remaining Contractual Maturity

(Dollars in millions)	Overnight and Continuous	30 Days or Less	After 30 Days Through 90 Days	Greater than 90 Days [1]	Total
		December 31, 2018			
Securities sold under agreements to repurchase	**$ 139,017**	**$ 81,917**	**$ 34,204**	**$ 21,476**	**$ 276,614**
Securities loaned	**7,753**	**4,197**	**1,783**	**3,506**	**17,239**
Other	**19,906**	**—**	**—**	**—**	**19,906**
Total	**$ 166,676**	**$ 86,114**	**$ 35,987**	**$ 24,982**	**$ 313,759**
		December 31, 2017			
Securities sold under agreements to repurchase	$ 125,956	$ 79,913	$ 46,091	$ 38,935	$ 290,895
Securities loaned	9,853	5,658	2,043	4,133	21,687
Other	22,711	—	—	—	22,711
Total	$ 158,520	$ 85,571	$ 48,134	$ 43,068	$ 335,293

(1) No agreements have maturities greater than three years.

Class of Collateral Pledged

(Dollars in millions)	Securities Sold Under Agreements to Repurchase	Securities Loaned	Other	Total
		December 31, 2018		
U.S. government and agency securities	$ 164,664	$ —	$ —	$ 164,664
Corporate securities, trading loans and other	11,400	2,163	287	13,850
Equity securities	14,090	10,869	19,572	44,531
Non-U.S. sovereign debt	81,329	4,207	47	85,583
Mortgage trading loans and ABS	5,131	—	—	5,131
Total	**$ 276,614**	**$ 17,239**	**$ 19,906**	**$ 313,759**
		December 31, 2017		
U.S. government and agency securities	$ 158,299	$ —	$ 409	$ 158,708
Corporate securities, trading loans and other	12,787	2,669	624	16,080
Equity securities	23,975	13,523	21,628	59,126
Non-U.S. sovereign debt	90,857	5,495	50	96,402
Mortgage trading loans and ABS	4,977	—	—	4,977
Total	$ 290,895	$ 21,687	$ 22,711	$ 335,293

Under repurchase agreements, the Corporation is required to post collateral with a market value equal to or in excess of the principal amount borrowed. For securities loaned transactions, the Corporation receives collateral in the form of cash, letters of credit or other securities. To determine whether the market value of the underlying collateral remains sufficient, collateral is generally valued daily, and the Corporation may be required to deposit additional collateral or may receive or return collateral pledged when appropriate. Repurchase agreements and securities loaned transactions are generally either overnight, continuous (i.e., no stated term) or short-term. The Corporation manages liquidity risks related to these agreements by sourcing funding from a diverse group of counterparties, providing a range of securities collateral and pursuing longer durations, when appropriate.

Restricted Cash

At December 31, 2018 and 2017, the Corporation held restricted cash included within cash and cash equivalents on the Consolidated Balance Sheet of $22.6 billion and $18.8 billion, predominantly related to cash held on deposit with the Federal Reserve Bank and non-U.S. central banks to meet reserve requirements and cash segregated in compliance with securities regulations.

NOTE 11 Long-term Debt

Long-term debt consists of borrowings having an original maturity of one year or more. The table below presents the balance of long-term debt at December 31, 2018 and 2017, and the related contractual rates and maturity dates as of December 31, 2018.

(Dollars in millions)	Weighted-average Rate	Interest Rates	Maturity Dates	December 31 2018	December 31 2017
Notes issued by Bank of America Corporation					
Senior notes:					
Fixed	3.39 %	0.39 - 8.40 %	2019 - 2049	$ 120,548	$ 119,548
Floating	2.09	0.06 - 7.26	2019 - 2044	25,574	21,048
Senior structured notes (1)				13,768	15,460
Subordinated notes:					
Fixed	4.91	2.94 - 8.57	2019 - 2045	20,843	22,004
Floating	2.16	1.14 - 3.55	2019 - 2026	1,742	4,058
Junior subordinated notes (2):					
Fixed	6.71	6.45 - 8.05	2027 - 2066	732	3,282
Floating	3.54	3.54	2056	1	553
Total notes issued by Bank of America Corporation				183,208	185,953
Notes issued by Bank of America, N.A.					
Senior notes:					
Fixed				—	4,686
Floating	2.96	2.90 - 2.96	2020 - 2041	1,770	1,033
Subordinated notes	6.00	6.00	2036	1,617	1,679
Advances from Federal Home Loan Banks:					
Fixed	5.10	0.01 - 7.72	2019 - 2034	130	146
Floating	2.49	2.24 - 2.80	2019 - 2020	14,751	5,000
Securitizations and other BANA VIEs (3)				10,326	8,641
Other				442	433
Total notes issued by Bank of America, N.A.				29,036	21,618
Other debt					
Structured liabilities				16,478	18,574
Nonbank VIEs (3)				618	1,232
Other				—	25
Total other debt				17,096	19,831
Total long-term debt				$ 229,340	$ 227,402

(1) Includes total loss-absorbing capacity compliant debt.
(2) Includes amounts related to trust preferred securities. For additional information, see Trust Preferred Securities in this Note.
(3) Represents the total long-term debt included in the liabilities of consolidated VIEs on the Consolidated Balance Sheet.

Bank of America Corporation and Bank of America, N.A. maintain various U.S. and non-U.S. debt programs to offer both senior and subordinated notes. The notes may be denominated in U.S. dollars or foreign currencies. At December 31, 2018 and 2017, the amount of foreign currency-denominated debt translated into U.S. dollars included in total long-term debt was $48.6 billion and $51.8 billion. Foreign currency contracts may be used to convert certain foreign currency-denominated debt into U.S. dollars.

At December 31, 2018, long-term debt of consolidated VIEs in the table above included debt from credit card and all other VIEs of $10.3 billion and $623 million. Long-term debt of VIEs is collateralized by the assets of the VIEs. For additional information, see *Note 7 – Securitizations and Other Variable Interest Entities.*

The weighted-average effective interest rates for total long-term debt (excluding senior structured notes), total fixed-rate debt and total floating-rate debt were 3.29 percent, 3.66 percent and 2.26 percent, respectively, at December 31, 2018, and 3.44 percent, 3.87 percent and 1.49 percent, respectively, at December 31, 2017. The Corporation's ALM activities maintain an overall interest rate risk management strategy that incorporates the use of interest rate contracts to manage fluctuations in earnings that are caused by interest rate volatility. The Corporation's goal is to manage interest rate sensitivity so that movements in interest rates do not significantly adversely affect earnings and capital. The weighted-average rates are the contractual interest rates on the debt and do not reflect the impacts of derivative transactions.

Debt outstanding of $3.8 billion at December 31, 2018 was issued by BofA Finance LLC, a 100 percent owned finance subsidiary of Bank of America Corporation, the parent company, and is fully and unconditionally guaranteed by the parent company.

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

The following table shows the carrying value for aggregate annual contractual maturities of long-term debt as of December 31, 2018. Included in the table are certain structured notes issued by the Corporation that contain provisions whereby the borrowings are redeemable at the option of the holder (put options) at specified dates prior to maturity. Other structured notes have coupon or repayment terms linked to the performance of debt or equity securities, indices, currencies or commodities, and the maturity may be accelerated based on the value of a referenced index or security. In both cases, the Corporation or a subsidiary may be required to settle the obligation for cash or other securities prior to the contractual maturity date. These borrowings are reflected in the table as maturing at their contractual maturity date.

Long-term Debt by Maturity

(Dollars in millions)	2019	2020	2021	2022	2023	Thereafter	Total
Bank of America Corporation							
Senior notes	$ 14,831	$ 10,308	$ 15,883	$ 14,882	$ 22,570	$ 67,648	**$ 146,122**
Senior structured notes	1,337	875	482	1,914	323	8,837	**13,768**
Subordinated notes	1,501	—	346	364	—	20,374	**22,585**
Junior subordinated notes	—	—	—	—	—	733	**733**
Total Bank of America Corporation	17,669	11,183	16,711	17,160	22,893	97,592	**183,208**
Bank of America, N.A.							
Senior notes	—	1,750	—	—	—	20	**1,770**
Subordinated notes	—	—	—	—	—	1,617	**1,617**
Advances from Federal Home Loan Banks	11,762	3,010	2	3	1	103	**14,881**
Securitizations and other Bank VIEs (1)	3,200	3,100	4,022	—	—	4	**10,326**
Other	224	83	—	2	133	—	**442**
Total Bank of America, N.A.	15,186	7,943	4,024	5	134	1,744	**29,036**
Other debt							
Structured liabilities	5,085	2,712	1,112	558	830	6,181	**16,478**
Nonbank VIEs (1)	35	—	—	—	23	560	**618**
Total other debt	5,120	2,712	1,112	558	853	6,741	**17,096**
Total long-term debt	**$ 37,975**	**$ 21,838**	**$ 21,847**	**$ 17,723**	**$ 23,880**	**$ 106,077**	**$ 229,340**

(1) Represents the total long-term debt included in the liabilities of consolidated VIEs on the Consolidated Balance Sheet.

Trust Preferred Securities

Trust preferred securities (Trust Securities) are primarily issued by trust companies (the Trusts) that are not consolidated. These Trust Securities are mandatorily redeemable preferred security obligations of the Trusts. The sole assets of the Trusts generally are junior subordinated deferrable interest notes of the Corporation or its subsidiaries (the Notes). The Trusts generally are 100 percent owned finance subsidiaries of the Corporation.

Periodic cash payments and payments upon liquidation or redemption with respect to Trust Securities are guaranteed by the Corporation or its subsidiaries to the extent of funds held by the Trusts (the Preferred Securities Guarantee). The Preferred Securities Guarantee, when taken together with the Corporation's other obligations including its obligations under the Notes, generally will constitute a full and unconditional guarantee, on a subordinated basis, by the Corporation of payments due on the Trust Securities.

During 2018, the Corporation redeemed Trust Securities of 11 Trusts with a carrying value of $3.1 billion. At December 31, 2018, the Corporation had one remaining floating-rate junior subordinated note held in trust.

NOTE 12 Commitments and Contingencies

In the normal course of business, the Corporation enters into a number of off-balance sheet commitments. These commitments expose the Corporation to varying degrees of credit and market risk and are subject to the same credit and market risk limitation reviews as those instruments recorded on the Consolidated Balance Sheet.

Credit Extension Commitments

The Corporation enters into commitments to extend credit such as loan commitments, SBLCs and commercial letters of credit to meet the financing needs of its customers. The following table includes the notional amount of unfunded legally binding lending commitments net of amounts distributed (i.e., syndicated or participated) to other financial institutions. The distributed amounts were $10.7 billion and $11.0 billion at December 31, 2018 and 2017. At December 31, 2018, the carrying value of these commitments, excluding commitments accounted for under the fair value option, was $813 million, including deferred revenue of $16 million and a reserve for unfunded lending commitments of $797 million. At December 31, 2017, the comparable amounts were $793 million, $16 million and $777 million, respectively. The carrying value of these commitments is classified in accrued expenses and other liabilities on the Consolidated Balance Sheet.

Legally binding commitments to extend credit generally have specified rates and maturities. Certain of these commitments have adverse change clauses that help to protect the Corporation against deterioration in the borrower's ability to pay.

The table below also includes the notional amount of commitments of $3.1 billion and $4.8 billion at December 31, 2018 and 2017 that are accounted for under the fair value option. However, the following table excludes cumulative net fair value of $169 million and $120 million at December 31, 2018 and 2017 on these commitments, which is classified in accrued expenses and other liabilities. For more information regarding the Corporation's loan commitments accounted for under the fair value option, see *Note 21 – Fair Value Option.*

Credit Extension Commitments

(Dollars in millions)	Expire in One Year or Less	Expire After One Year Through Three Years	Expire After Three Years Through Five Years	Expire After Five Years	Total
			December 31, 2018		
Notional amount of credit extension commitments					
Loan commitments	**$ 84,910**	**$ 142,271**	**$ 155,298**	**$ 22,683**	**$ 405,162**
Home equity lines of credit	**2,578**	**2,249**	**3,530**	**34,702**	**43,059**
Standby letters of credit and financial guarantees (1)	**22,571**	**9,702**	**2,457**	**1,074**	**35,804**
Letters of credit (2)	**1,168**	**84**	**69**	**57**	**1,378**
Legally binding commitments	**111,227**	**154,306**	**161,354**	**58,516**	**485,403**
Credit card lines (3)	**371,658**	**—**	**—**	**—**	**371,658**
Total credit extension commitments	**$ 482,885**	**$ 154,306**	**$ 161,354**	**$ 58,516**	**$ 857,061**
			December 31, 2017		
Notional amount of credit extension commitments					
Loan commitments	$ 85,804	$ 140,942	$ 147,043	$ 21,342	$ 395,131
Home equity lines of credit	6,172	4,457	2,288	31,250	44,167
Standby letters of credit and financial guarantees (1)	19,976	11,261	3,420	1,144	35,801
Letters of credit	1,291	117	129	87	1,624
Legally binding commitments	113,243	156,777	152,880	53,823	476,723
Credit card lines (3)	362,030	—	—	—	362,030
Total credit extension commitments	$ 475,273	$ 156,777	$ 152,880	$ 53,823	$ 838,753

(1) The notional amounts of SBLCs and financial guarantees classified as investment grade and non-investment grade based on the credit quality of the underlying reference name within the instrument were $28.3 billion and $7.1 billion at December 31, 2018, and $27.3 billion and $8.1 billion at December 31, 2017. Amounts in the table include consumer SBLCs of $372 million and $421 million at December 31, 2018 and 2017.

(2) At December 31, 2018, included letters of credit of $422 million related to certain liquidity commitments of VIEs. For additional information, see *Note 7 – Securitizations and Other Variable Interest Entities*.

(3) Includes business card unused lines of credit.

Other Commitments

At December 31, 2018 and 2017, the Corporation had commitments to purchase loans (e.g., residential mortgage and commercial real estate) of $329 million and $344 million, which upon settlement will be included in loans or LHFS, and commitments to purchase commercial loans of $463 million and $994 million, which upon settlement will be included in trading account assets.

At December 31, 2018 and 2017, the Corporation had commitments to purchase commodities, primarily liquefied natural gas, of $1.3 billion and $1.5 billion, which upon settlement will be included in trading account assets.

At December 31, 2018 and 2017, the Corporation had commitments to enter into resale and forward-dated resale and securities borrowing agreements of $59.7 billion and $56.8 billion, and commitments to enter into forward-dated repurchase and securities lending agreements of $21.2 billion and $34.3 billion. These commitments expire primarily within the next 12 months.

At both December 31, 2018 and 2017, the Corporation had a commitment to originate or purchase up to $3.0 billion, on a rolling 12-month basis, of auto loans and leases from a strategic partner. This commitment extends through November 2022 and can be terminated with 12 months prior notice.

The Corporation is a party to operating leases for certain of its premises and equipment. Commitments under these leases are approximately $2.4 billion, $2.2 billion, $2.0 billion, $1.7 billion and $1.3 billion for 2019 and the years through 2023, respectively, and $6.2 billion in the aggregate for all years thereafter.

Other Guarantees

Bank-owned Life Insurance Book Value Protection

The Corporation sells products that offer book value protection to insurance carriers who offer group life insurance policies to corporations, primarily banks. At December 31, 2018 and 2017, the notional amount of these guarantees totaled $9.8 billion and $10.4 billion. At December 31, 2018 and 2017, the Corporation's maximum exposure related to these guarantees totaled $1.5 billion and $1.6 billion, with estimated maturity dates between 2033 and 2039.

Indemnifications

In the ordinary course of business, the Corporation enters into various agreements that contain indemnifications, such as tax indemnifications, whereupon payment may become due if certain external events occur, such as a change in tax law. The indemnification clauses are often standard contractual terms and were entered into in the normal course of business based on an assessment that the risk of loss would be remote. These agreements typically contain an early termination clause that permits the Corporation to exit the agreement upon these events. The maximum potential future payment under indemnification agreements is difficult to assess for several reasons, including the occurrence of an external event, the inability to predict future changes in tax and other laws, the difficulty in determining how such laws would apply to parties in contracts, the absence of exposure limits contained in standard contract language and the timing of any early termination clauses. Historically, any payments made under these guarantees have been de minimis. The Corporation has assessed the probability of making such payments in the future as remote.

Merchant Services

In accordance with credit and debit card association rules, the Corporation sponsors merchant processing servicers that process credit and debit card transactions on behalf of various merchants. If the merchant processor fails to meet its obligation to reimburse the cardholder for disputed transactions, then the Corporation, as the sponsor, could be held liable for the disputed amount. In 2018 and 2017, the sponsored entities processed and settled $874.3 billion and $812.2 billion of transactions and recorded losses of $31 million and $28 million. A significant portion of this activity was processed by a joint venture in which the Corporation holds a 49 percent ownership. The carrying value of the Corporation's investment in the merchant services joint venture was $2.8 billion and $2.9 billion at December 31, 2018 and 2017, and is recorded in other assets on the Consolidated Balance Sheet and in *All Other*.

At December 31, 2018 and 2017, the maximum potential exposure for sponsored transactions totaled $348.1 billion and $346.4 billion. However, the Corporation believes that the maximum potential exposure is not representative of the actual potential loss exposure and does not expect to make material payments in connection with these guarantees.

Exchange and Clearing House Member Guarantees

The Corporation is a member of various securities and derivative exchanges and clearinghouses, both in the U.S. and other countries. As a member, the Corporation may be required to pay a pro-rata share of the losses incurred by some of these organizations as a result of another member default and under other loss scenarios. The Corporation's potential obligations may be limited to its membership interests in such exchanges and clearinghouses, to the amount (or multiple) of the Corporation's contribution to the guarantee fund or, in limited instances, to the full pro-rata share of the residual losses after applying the guarantee fund. The Corporation's maximum potential exposure under these membership agreements is difficult to estimate; however, the Corporation has assessed the probability of making any such payments as remote.

Prime Brokerage and Securities Clearing Services

In connection with its prime brokerage and clearing businesses, the Corporation performs securities clearance and settlement services with other brokerage firms and clearinghouses on behalf of its clients. Under these arrangements, the Corporation stands ready to meet the obligations of its clients with respect to securities transactions. The Corporation's obligations in this respect are secured by the assets in the clients' accounts and the accounts of their customers as well as by any proceeds received from the transactions cleared and settled by the firm on behalf of clients or their customers. The Corporation's maximum potential exposure under these arrangements is difficult to estimate; however, the potential for the Corporation to incur material losses pursuant to these arrangements is remote.

Other Guarantees

The Corporation has entered into additional guarantee agreements and commitments, including sold risk participation swaps, liquidity facilities, lease-end obligation agreements, partial credit guarantees on certain leases, real estate joint venture guarantees, divested business commitments and sold put options that require gross settlement. The maximum potential future payment under these agreements was approximately $5.9 billion at both December 31, 2018 and 2017. The estimated maturity dates of these obligations extend up to 2040. The Corporation has made no material payments under these guarantees. For more information on maximum potential future payments under VIE-related liquidity commitments at December 31, 2018, see *Note 7 – Securitizations and Other Variable Interest Entities*.

In the normal course of business, the Corporation periodically guarantees the obligations of its affiliates in a variety of transactions including ISDA-related transactions and non-ISDA related transactions such as commodities trading, repurchase agreements, prime brokerage agreements and other transactions.

Payment Protection Insurance

On June 1, 2017, the Corporation sold its non-U.S. consumer credit card business. Included in the calculation of the gain on sale, the Corporation recorded an obligation to indemnify the purchaser for substantially all payment protection insurance exposure above reserves assumed by the purchaser.

Representations and Warranties Obligations and Corporate Guarantees

The Corporation securitizes first-lien residential mortgage loans generally in the form of RMBS guaranteed by the GSEs or by GNMA in the case of FHA-insured, VA-guaranteed and Rural Housing Service-guaranteed mortgage loans, and sells pools of first-lien residential mortgage loans in the form of whole loans. In addition, in prior years, legacy companies and certain subsidiaries sold pools of first-lien residential mortgage loans and home equity loans as private-label securitizations or in the form of whole loans. In connection with these transactions, the Corporation or certain of its subsidiaries or legacy companies make and have made various representations and warranties. Breaches of these representations and warranties have resulted in and may continue to result in the requirement to repurchase mortgage loans or to otherwise make whole or provide indemnification or other remedies to sponsors, investors, securitization trusts, guarantors, insurers or other parties (collectively, repurchases).

Unresolved Repurchase Claims

Unresolved representations and warranties repurchase claims represent the notional amount of repurchase claims made by counterparties, typically the outstanding principal balance or the unpaid principal balance at the time of default. In the case of first-lien mortgages, the claim amount is often significantly greater than the expected loss amount due to the benefit of collateral and, in some cases, mortgage insurance or mortgage guarantee payments. Claims received from a counterparty remain outstanding until the underlying loan is repurchased, the claim is rescinded by the counterparty, the Corporation determines that the applicable statute of limitations has expired, or representations and warranties claims with respect to the applicable trust are settled, and fully and finally released.

The notional amount of unresolved repurchase claims at December 31, 2018 and 2017 was $14.4 billion and $17.6 billion. This balance included $6.2 billion and $6.9 billion of claims related to loans in specific private-label securitization groups or tranches where the Corporation owns substantially all of the outstanding securities or will otherwise realize the benefit of any repurchase claims paid. The balance also includes $1.5 billion of repurchase claims related to a single monoline insurer and is the subject of litigation.

During 2018, the Corporation received $283 million in new repurchase claims, including $201 million in claims that were deemed time-barred. During 2018, $3.5 billion in claims were resolved, including $2.2 billion of claims that were deemed time-barred and $1.1 billion related to settlements. Although the pace of new claims has declined, it is possible the Corporation will receive additional claims or file requests in the future.

Reserve and Related Provision

The reserve for representations and warranties obligations and corporate guarantees at December 31, 2018 and 2017 was $2.0 billion and $1.9 billion and is included in accrued expenses and other liabilities on the Consolidated Balance Sheet and the related provision is included in other income in the Consolidated Statement of Income. The representations and warranties reserve represents the Corporation's best estimate of probable incurred losses. This reserve considers a number of provisional settlements with sponsors, investors and trustees, some of which are subject to trustee approval processes, which may include court proceedings. Future representations and warranties losses may occur in excess of the amounts recorded for these exposures; however, the Corporation does not expect such amounts to be material. Future provisions for representations and warranties may be significantly impacted if actual experiences are different from the Corporation's assumptions in predictive models. The Corporation has combined the range of reasonably possible losses that are in excess of the representations and warranties reserve with the litigation range of possible loss in excess of litigation reserves, as discussed in Litigation and Regulatory Matters in this Note. This is consistent with the reduction in outstanding representations and warranties exposure in comparison to prior periods resulting from the resolution of prior matters along with changes in the Corporation's business model.

The reserve for representations and warranties exposures does not consider certain losses related to servicing, including foreclosure and related costs, fraud, indemnity, or claims (including for RMBS) related to securities law or monoline insurance litigation. Losses with respect to one or more of these matters could be material to the Corporation's results of operations or liquidity for any particular reporting period.

Litigation and Regulatory Matters

In the ordinary course of business, the Corporation and its subsidiaries are routinely defendants in or parties to many pending and threatened legal, regulatory and governmental actions and proceedings. In view of the inherent difficulty of predicting the outcome of such matters, particularly where the claimants seek very large or indeterminate damages or where the matters present novel legal theories or involve a large number of parties, the Corporation generally cannot predict the eventual outcome of the pending matters, timing of the ultimate resolution of these matters, or eventual loss, fines or penalties related to each pending matter.

In accordance with applicable accounting guidance, the Corporation establishes an accrued liability when those matters present loss contingencies that are both probable and estimable. In such cases, there may be an exposure to loss in excess of any amounts accrued. As a matter develops, the Corporation, in conjunction with any outside counsel handling the matter, evaluates on an ongoing basis whether such matter presents a loss contingency that is probable and estimable. Once the loss contingency is deemed to be both probable and estimable, the Corporation will establish an accrued liability and record a corresponding amount of litigation-related expense. The Corporation continues to monitor the matter for further developments that could affect the amount of the accrued liability that has been previously established. Excluding expenses of internal and external legal service providers, litigation-related expense of $469 million and $753 million was recognized in 2018 and 2017.

For a limited number of the matters disclosed in this Note for which a loss, whether in excess of a related accrued liability or where there is no accrued liability, is reasonably possible in future periods, the Corporation is able to estimate a range of possible loss. In determining whether it is possible to estimate a range of possible loss, the Corporation reviews and evaluates its matters on an ongoing basis, in conjunction with any outside counsel handling the matter, in light of potentially relevant factual and legal developments. With respect to the matters disclosed in this Note, in cases in which the Corporation possesses sufficient appropriate information to estimate a range of possible loss, that estimate is aggregated and disclosed below. There may be other disclosed matters for which a loss is probable or reasonably possible but such an estimate of the range of possible loss may not be possible. For such matters disclosed in this Note, where an estimate of the range of possible loss is possible, as well as for representations and warranties exposures, management currently estimates the aggregate range of reasonably possible loss for these exposures is $0 to $1.9 billion in excess of the accrued liability, if any. This estimated range of possible loss is based upon currently available information and is subject to significant judgment and a variety of assumptions and known and unknown uncertainties. The matters underlying the estimated range will change from time to time, and actual results may vary significantly from the current estimate. Therefore, this estimated range of possible loss represents what the Corporation believes to be an estimate of possible loss only for certain matters meeting these criteria. It does not represent the Corporation's maximum loss exposure.

Information is provided below regarding the nature of the litigation contingencies and, where specified, the amount of the claim associated with these loss contingencies. Based on current knowledge, management does not believe that loss contingencies arising from pending matters, including the matters described herein, will have a material adverse effect on the consolidated financial position or liquidity of the Corporation. However, in light of the inherent uncertainties involved in these matters, some of which are beyond the Corporation's control, and the very large or indeterminate damages sought in some of these matters, an adverse outcome in one or more of these matters could be material to the Corporation's results of operations or liquidity for any particular reporting period.

Ambac Bond Insurance Litigation

Ambac Assurance Corporation and the Segregated Account of Ambac Assurance Corporation (together, Ambac) have filed four separate lawsuits against the Corporation and its subsidiaries relating to bond insurance policies Ambac provided on certain securitized pools of HELOCs, first-lien subprime home equity loans, fixed-rate second-lien mortgage loans and negative amortization pay option adjustable-rate mortgage loans. Ambac alleges that they have paid or will pay claims as a result of defaults in the underlying loans and asserts that the defendants misrepresented the characteristics of the underlying loans and/or breached certain contractual representations and warranties regarding the underwriting and servicing of the loans. In those actions where the Corporation is named as a defendant, Ambac contends the Corporation is liable on various successor and vicarious liability theories.

Ambac v. Countrywide I

The Corporation, Countrywide and other Countrywide entities are named as defendants in an action filed on September 28, 2010 in New York Supreme Court. Ambac asserts claims for fraudulent inducement as well as breach of contract and seeks damages in excess of $2.2 billion, plus punitive damages.

On May 16, 2017, the First Department issued its decisions on the parties' cross-appeals of the trial court's October 22, 2015 summary judgment rulings. Ambac appealed the First Department's rulings requiring Ambac to prove all of the elements of its fraudulent inducement claim, including justifiable reliance and loss causation; restricting Ambac's sole remedy for its breach of contract claims to the repurchase protocol of cure, repurchase or substitution of any materially defective loan; and dismissing Ambac's claim for reimbursements of attorneys' fees. On June 27, 2018, the New York Court of Appeals affirmed the First Department rulings that Ambac appealed.

Ambac v. Countrywide II

On December 30, 2014, Ambac filed a complaint in New York Supreme Court against the same defendants, claiming fraudulent inducement against Countrywide, and successor and vicarious liability against the Corporation. Ambac seeks damages in excess of $600 million, plus punitive damages. On December 19, 2016, the Court granted in part and denied in part Countrywide's motion to dismiss the complaint.

Ambac v. Countrywide IV

On July 21, 2015, Ambac filed an action in New York Supreme Court against Countrywide asserting the same claims for fraudulent inducement that Ambac asserted in the now-dismissed *Ambac v. Countrywide III*. The complaint seeks damages in excess of $350 million, plus punitive damages.

Ambac v. First Franklin

On April 16, 2012, Ambac filed an action against BANA, First Franklin and various Merrill Lynch entities, including Merrill Lynch, Pierce, Fenner & Smith Incorporated (MLPF&S), in New York Supreme Court relating to guaranty insurance Ambac provided on a First Franklin securitization sponsored by Merrill Lynch. The complaint alleges fraudulent inducement and breach of contract, including breach of contract claims against BANA based upon its servicing of the loans in the securitization. Ambac seeks as damages hundreds of millions of dollars that Ambac alleges it has paid or will pay in claims.

Deposit Insurance Assessment

On January 9, 2017, the FDIC filed suit against BANA in U.S. District Court for the District of Columbia alleging failure to pay a December 15, 2016 invoice for additional deposit insurance assessments and interest in the amount of $542 million for the quarters ending June 30, 2013 through December 31, 2014. On April 7, 2017, the FDIC amended its complaint to add a claim for additional deposit insurance and interest in the amount of $583 million for the quarters ending March 31, 2012 through March 31, 2013. The FDIC asserts these claims based on BANA's alleged underreporting of counterparty exposures that resulted in underpayment of assessments for those quarters. BANA disagrees with the FDIC's interpretation of the regulations as they existed during the relevant time period and is defending itself against the FDIC's claims. Pending final resolution, BANA has pledged security satisfactory to the FDIC related to the disputed additional assessment amounts.

On March 27, 2018, the U.S. District Court for the District of Columbia denied BANA's partial motion to dismiss certain of the FDIC's claims.

Interchange and Related Litigation

In 2005, a group of merchants filed a series of putative class actions and individual actions directed at interchange fees associated with Visa and MasterCard payment card transactions. These actions, which were consolidated in the U.S. District Court for the Eastern District of New York under the caption *In re Payment Card Interchange Fee and Merchant Discount Anti-Trust Litigation* (Interchange), named Visa, MasterCard and several banks and bank holding companies, including the Corporation, as defendants. Plaintiffs alleged that defendants conspired to fix the level of default interchange rates and that certain rules of Visa and MasterCard were unreasonable restraints of trade. Plaintiffs sought compensatory and treble damages and injunctive relief.

On October 19, 2012, defendants reached a settlement with respect to the putative class actions that the U.S. Court of Appeals for the Second Circuit rejected. In 2018, defendants reached a settlement with the representatives of the putative Rule 23(b)(3) damages class to contribute an additional $900 million to the approximately $5.3 billion held in escrow from the prior settlement. The Corporation's additional contribution is not material to the Corporation. The District Court granted preliminary approval of the settlement with the putative Rule 23(b)(3) damages class in January 2019.

In addition, the putative Rule 23(b)(2) class action seeking injunctive relief is pending, and a number of individual merchant actions continue against the defendants, including one against the Corporation. As a result of various loss-sharing agreements, however, the Corporation remains liable for a portion of any settlement or judgment in individual suits where it is not named as a defendant.

LIBOR, Other Reference Rates, Foreign Exchange (FX) and Bond Trading Matters

Government authorities in the U.S. and various international jurisdictions continue to conduct investigations, to make inquiries of, and to pursue proceedings against, the Corporation and its subsidiaries regarding FX and other reference rates as well as government, sovereign, supranational and agency bonds in connection with conduct and systems and controls. The Corporation is cooperating with these inquiries and investigations and responding to the proceedings.

Foreign Exchange (FX)

The Corporation, BANA and MLPF&S were named as defendants along with other FX market participants in a putative class action filed in the U.S. District Court for the Southern District of New York, in which plaintiffs allege that they sustained losses as a result of the defendants' alleged conspiracy to manipulate the prices of OTC FX transactions and FX transactions on an exchange. Plaintiffs assert antitrust claims and claims for violations of the Commodity Exchange Act (CEA) and seek compensatory and treble damages, as well as declaratory and injunctive relief. On October 1, 2015, the Corporation, BANA and MLPF&S executed a final settlement agreement, in which they agreed to pay participating class members $187.5 million to settle the litigation. In 2018, the District Court granted final approval to the settlement.

LIBOR

The Corporation, BANA and certain Merrill Lynch entities have been named as defendants along with most of the other London InterBank Offered Rate (LIBOR) panel banks in a number of individual and putative class actions by persons alleging they sustained losses on U.S. dollar LIBOR-based financial instruments as a result of collusion or manipulation by defendants regarding the setting of U.S. dollar LIBOR. Plaintiffs assert a variety of claims, including antitrust, CEA, Racketeer Influenced and Corrupt Organizations (RICO), Securities Exchange Act of 1934, common law fraud and breach of contract claims, and seek compensatory, treble and punitive damages, and injunctive relief. All cases naming the Corporation and its affiliates relating to U.S. dollar LIBOR are pending in the U.S. District Court for the Southern District of New York.

The District Court has dismissed all RICO claims, and dismissed all manipulation claims based on alleged trader conduct against Bank of America entities. The District Court has also substantially limited the scope of antitrust, CEA and various other claims, including by dismissing in their entirety certain individual and putative class plaintiffs' antitrust claims for lack of standing and/or personal jurisdiction. Plaintiffs whose antitrust claims were dismissed by the District Court are pursuing appeals in the Second Circuit. Certain individual and putative class actions remain pending in the District Court against the Corporation, BANA and certain Merrill Lynch entities.

On February 28, 2018, the District Court denied certification of proposed classes of lending institutions and persons that transacted in eurodollar futures, and the U.S. Court of Appeals for the Second Circuit subsequently denied petitions filed by those plaintiffs for interlocutory appeals of those rulings. Also on February 28, 2018, the District Court granted certification of a class of persons that purchased OTC swaps and notes that referenced U.S. dollar LIBOR from one of the U.S. dollar LIBOR panel banks, limited to claims under Section 1 of the Sherman Act. The U.S. Court of Appeals for the Second Circuit subsequently denied a petition filed by the defendants for interlocutory appeal of that ruling.

Mortgage Appraisal Litigation

The Corporation and certain subsidiaries are named as defendants in two putative class action lawsuits filed in U.S. District Court for the Central District of California (*Waldrup and Williams, et al.*). In November 2016, the actions were consolidated for pre-trial purposes. Plaintiffs allege that in fulfilling orders made by Countrywide for residential mortgage appraisal services, a former Countrywide subsidiary, LandSafe Appraisal Services, Inc., arranged for and completed appraisals that were not in compliance with applicable laws and appraisal standards. Plaintiffs seek, among other forms of relief, compensatory and treble damages.

On February 8, 2018, the District Court granted plaintiffs' motion for class certification. On May 22, 2018, the U.S. Court of Appeals for the Ninth Circuit denied Defendants' petition for permission to file an interlocutory appeal of the District Court's ruling granting class certification.

Mortgage-backed Securities Litigation

The Corporation and its affiliates, Countrywide entities and their affiliates, and Merrill Lynch entities and their affiliates have been named as defendants in cases relating to their various roles in MBS offerings and, in certain instances, have received claims for contractual indemnification related to the MBS securities actions. Plaintiffs in these cases generally sought unspecified compensatory and/or rescissory damages, unspecified costs and legal fees and generally alleged false and misleading statements. The indemnification claims include claims from underwriters of MBS that were issued by these entities, and from underwriters and issuers of MBS backed by loans originated by these entities.

Mortgage Repurchase Litigation

U.S. Bank - Harborview Repurchase Litigation

On August 29, 2011, U.S. Bank, National Association (U.S. Bank), as trustee for the HarborView Mortgage Loan Trust 2005-10 (the Trust), a mortgage pool backed by loans originated by Countrywide Home Loans, Inc. (CHL), filed a complaint in New York Supreme Court against the Corporation and various subsidiaries alleging breaches of representations and warranties. This litigation has been stayed since March 23, 2017, pending finalization of the settlement discussed below.

On December 5, 2016, the defendants and certain certificate-holders in the Trust agreed to settle the litigation in an amount not material to the Corporation, subject to acceptance by U.S. Bank.

U.S. Bank - SURF/OWNIT Repurchase Litigation

On August 29, 2014 and September 2, 2014, U.S. Bank, as trustee for seven securitization trusts (the Trusts), served seven summonses with notice commencing actions against various subsidiaries of the Corporation in New York Supreme Court. The summonses advance breach of contract claims alleging that defendants breached representations and warranties related to loans securitized in the Trusts. The summonses allege that defendants failed to repurchase breaching mortgage loans from the Trusts, and seek specific performance of defendants' alleged obligation to repurchase breaching loans, declaratory judgment, compensatory, rescissory and other damages, and indemnity.

U.S. Bank has served complaints regarding six of the seven Trusts. In 2018, for those six Trusts, the defendants and certain certificate-holders agreed to settle the respective litigations in amounts not material to the Corporation, subject to acceptance by U.S. Bank.

NOTE 13 Shareholders' Equity

Common Stock

Declared Quarterly Cash Dividends on Common Stock [1]

Declaration Date	Record Date	Payment Date	Dividend Per Share
January 30, 2019	March 1, 2019	March 29, 2019	$ 0.15
October 24, 2018	December 7, 2018	December 28, 2018	0.15
July 26, 2018	September 7, 2018	September 28, 2018	0.15
April 25, 2018	June 1, 2018	June 29, 2018	0.12
January 31, 2018	March 2, 2018	March 30, 2018	0.12

(1) In 2018, and through February 26, 2019.

The cash dividends paid per share of common stock were $0.54, $0.39 and $0.25 for 2018, 2017 and 2016, respectively.

The following table summarizes common stock repurchases during 2018, 2017 and 2016.

Common Stock Repurchase Summary

(in millions)	2018	2017	2016
Total share repurchases, including CCAR capital plan repurchases	676	509	333
Purchase price of shares repurchased and retired [1]			
CCAR capital plan repurchases	$ 16,754	$ 9,347	$ 4,312
Other authorized repurchases	3,340	3,467	800
Total shares repurchased	$ 20,094	$12,814	$ 5,112

(1) Represents reductions to shareholders' equity due to common stock repurchases.

On June 28, 2018, following the non-objection of the Board of Governors of the Federal Reserve System (Federal Reserve) to the Corporation's 2018 Comprehensive Capital Analysis and Review (CCAR) capital plan, the Board of Directors (Board) authorized the repurchase of approximately $20.6 billion in common stock from July 1, 2018 through June 30, 2019, which includes approximately $600 million in repurchases to offset shares awarded under equity-based compensation plans during the same period. The common stock repurchase authorization includes both common stock and warrants.

During 2018, the Corporation repurchased $20.1 billion of common stock in connection with the 2018 and 2017 CCAR capital plans and pursuant to a December 5, 2017 authorization to repurchase an additional $5.0 billion in common stock.

At December 31, 2018, the Corporation had warrants outstanding and exercisable to purchase 121 million shares of common stock. These warrants, substantially all of which were exercised on or before the expiration date of January 16, 2019, were originally issued in connection with a preferred stock issuance to the U.S. Department of the Treasury in 2009 and were listed on the New York Stock Exchange.

On August 24, 2017, the holders of the Corporation's Series T 6% Non-cumulative preferred stock (Series T) exercised warrants to acquire 700 million shares of the Corporation's common stock. The carrying value of the preferred stock was $2.9 billion and, upon conversion, was recorded as additional paid-in capital. For more information, see *Note 15 – Earnings Per Common Share.*

In connection with employee stock plans, in 2018, the Corporation issued 75 million shares of its common stock and, to satisfy tax withholding obligations, repurchased 29 million shares of its common stock. At December 31, 2018, the Corporation had reserved 781 million unissued shares of common stock for future issuances under employee stock plans, common stock warrants, convertible notes and preferred stock.

Preferred Stock

The cash dividends declared on preferred stock were $1.5 billion, $1.6 billion and $1.7 billion for 2018, 2017 and 2016, respectively.

On March 15, 2018, the Corporation issued 94,000 shares of 5.875% Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series FF for $2.35 billion. On May 16, 2018, the Corporation issued 54,000 shares of 6.000% Fixed Rate Non-Cumulative Preferred Stock, Series GG for $1.35 billion. On July 24, 2018, the Corporation issued 34,160 shares of 5.875% Non-Cumulative Preferred Stock, Series HH for $854 million.

In 2018, the Corporation fully redeemed Series D, Series I, Series K, Series M and Series 3 preferred stock for a total of $4.5 billion.

All series of preferred stock in the Preferred Stock Summary table have a par value of $0.01 per share, are not subject to the operation of a sinking fund, have no participation rights, and with the exception of the Series L Preferred Stock, are not convertible. The holders of the Series B Preferred Stock and Series 1 through 5 Preferred Stock have general voting rights and vote together with the common stock. The holders of the other series included in the table have no general voting rights. All outstanding series of preferred stock of the Corporation have preference over the Corporation's common stock with respect to the payment of dividends and distribution of the Corporation's assets in the event of a liquidation or dissolution. With the exception of the Series B, F, G and T Preferred Stock, if any dividend payable on these series is in arrears for three or more semi-annual or six or more quarterly dividend periods, as applicable (whether consecutive or not), the holders of these series and any other class or series of preferred stock ranking equally as to payment of dividends and upon which equivalent voting rights have been conferred and are exercisable (voting as a single class) will be entitled to vote for the election of two additional directors. These voting rights terminate when the Corporation has paid in full dividends on these series for at least two semi-annual or four quarterly dividend periods, as applicable, following the dividend arrearage.

The 7.25% Non-Cumulative Perpetual Convertible Preferred Stock, Series L (Series L Preferred Stock) does not have early redemption/call rights. Each share of the Series L Preferred Stock may be converted at any time, at the option of the holder, into 20 shares of the Corporation's common stock plus cash in lieu of fractional shares. The Corporation may cause some or all of the Series L Preferred Stock, at its option, at any time or from time to time, to be converted into shares of common stock at the then-applicable conversion rate if, for 20 trading days during any period of 30 consecutive trading days, the closing price of common stock exceeds 130 percent of the then-applicable conversion price of the Series L Preferred Stock. If a conversion of Series L Preferred Stock occurs at the option of the holder, subsequent to a dividend record date but prior to the dividend payment date, the Corporation will still pay any accrued dividends payable.

The table on the following page presents a summary of perpetual preferred stock outstanding at December 31, 2018.

Preferred Stock Summary

(Dollars in millions, except as noted)

Series	Description	Initial Issuance Date	Total Shares Outstanding	Liquidation Preference per Share (in dollars)	Carrying Value	Per Annum Dividend Rate	Dividend per Share (in dollars)	Annual Dividend	Redemption Period [(1)]
Series B	7% Cumulative Redeemable	June 1997	7,110	$ 100	$ 1	7.00%	$ 7.00	$ —	n/a
Series E [(2)]	Floating Rate Non-Cumulative	November 2006	12,691	25,000	317	3-mo. LIBOR + 35 bps [(3)]	1.01	13	On or after November 15, 2011
Series F	Floating Rate Non-Cumulative	March 2012	1,409	100,000	141	3-mo. LIBOR + 40 bps [(3)]	4,055.56	6	On or after March 15, 2012
Series G	Adjustable Rate Non-Cumulative	March 2012	4,926	100,000	493	3-mo. LIBOR + 40 bps [(3)]	4,055.56	20	On or after March 15, 2012
Series L	7.25% Non-Cumulative Perpetual Convertible	January 2008	3,080,182	1,000	3,080	7.25%	72.50	223	n/a
Series T	6% Non-cumulative	September 2011	354	100,000	35	6.00%	6,000.00	2	After May 7, 2019
Series U [(4)]	Fixed-to-Floating Rate Non-Cumulative	May 2013	40,000	25,000	1,000	5.2% to, but excluding, 6/1/23; 3-mo. LIBOR + 313.5 bps thereafter	52.00	52	On or after June 1, 2023
Series V [(4)]	Fixed-to-Floating Rate Non-Cumulative	June 2014	60,000	25,000	1,500	5.125% to, but excluding, 6/17/19; 3-mo. LIBOR + 338.7 bps thereafter	51.25	77	On or after June 17, 2019
Series W [(2)]	6.625% Non-Cumulative	September 2014	44,000	25,000	1,100	6.625%	1.66	73	On or after September 9, 2019
Series X [(4)]	Fixed-to-Floating Rate Non-Cumulative	September 2014	80,000	25,000	2,000	6.250% to, but excluding, 9/5/24; 3-mo. LIBOR + 370.5 bps thereafter	62.50	125	On or after September 5, 2024
Series Y [(2)]	6.500% Non-Cumulative	January 2015	44,000	25,000	1,100	6.500%	1.63	72	On or after January 27, 2020
Series Z [(4)]	Fixed-to-Floating Rate Non-Cumulative	October 2014	56,000	25,000	1,400	6.500% to, but excluding, 10/23/24; 3-mo. LIBOR + 417.4 bps thereafter	65.00	91	On or after October 23, 2024
Series AA [(4)]	Fixed-to-Floating Rate Non-Cumulative	March 2015	76,000	25,000	1,900	6.100% to, but excluding, 3/17/25; 3-mo. LIBOR + 389.8 bps thereafter	61.00	116	On or after March 17, 2025
Series CC [(2)]	6.200% Non-Cumulative	January 2016	44,000	25,000	1,100	6.200%	1.55	68	On or after January 29, 2021
Series DD [(4)]	Fixed-to-Floating Rate Non-Cumulative	March 2016	40,000	25,000	1,000	6.300% to, but excluding, 3/10/26; 3-mo. LIBOR + 455.3 bps thereafter	63.00	63	On or after March 10, 2026
Series EE [(2)]	6.000% Non-Cumulative	April 2016	36,000	25,000	900	6.000%	1.50	54	On or after April 25, 2021
Series FF [(4)]	Fixed-to-Floating Rate Non-Cumulative	March 2018	94,000	25,000	2,350	5.875% to, but excluding, 3/15/28; 3-mo. LIBOR + 293.1 bps thereafter	29.38	69	On or after March 15, 2028
Series GG [(2)]	6.000% Non-Cumulative	May 2018	54,000	25,000	1,350	6.000%	0.75	41	On or after May 16, 2023
Series HH [(2)]	5.875% Non-Cumulative	July 2018	34,160	25,000	854	5.875%	0.73	25	On or after July 24, 2023
Series 1 [(5)]	Floating Rate Non-Cumulative	November 2004	3,275	30,000	98	3-mo. LIBOR + 75 bps [(6)]	0.76	3	On or after November 28, 2009
Series 2 [(5)]	Floating Rate Non-Cumulative	March 2005	9,967	30,000	299	3-mo. LIBOR + 65 bps [(6)]	0.76	9	On or after November 28, 2009
Series 4 [(5)]	Floating Rate Non-Cumulative	November 2005	7,010	30,000	210	3-mo. LIBOR + 75 bps [(3)]	1.01	9	On or after November 28, 2010
Series 5 [(5)]	Floating Rate Non-Cumulative	March 2007	14,056	30,000	422	3-mo. LIBOR + 50 bps [(3)]	1.01	17	On or after May 21, 2012
Issuance costs and certain adjustments					(324)				
Total			3,843,140		$ 22,326				

(1) The Corporation may redeem series of preferred stock on or after the redemption date, in whole or in part, at its option, at the liquidation preference plus declared and unpaid dividends. Series B and Series L Preferred Stock do not have early redemption/call rights.
(2) Ownership is held in the form of depositary shares, each representing a 1/1,000th interest in a share of preferred stock, paying a quarterly cash dividend, if and when declared.
(3) Subject to 4.00% minimum rate per annum.
(4) Ownership is held in the form of depositary shares, each representing a 1/25th interest in a share of preferred stock, paying a semi-annual cash dividend, if and when declared, until the first redemption date at which time, it adjusts to a quarterly cash dividend, if and when declared, thereafter.
(5) Ownership is held in the form of depositary shares, each representing a 1/1,200th interest in a share of preferred stock, paying a quarterly cash dividend, if and when declared.
(6) Subject to 3.00% minimum rate per annum.
n/a = not applicable

NOTE 14 Accumulated Other Comprehensive Income (Loss)

The table below presents the changes in accumulated OCI after-tax for 2016, 2017 and 2018.

(Dollars in millions)	Debt and Equity Securities	Debit Valuation Adjustments	Derivatives	Employee Benefit Plans	Foreign Currency	Total
Balance, December 31, 2015	$ 78	$ (611)	$ (1,077)	$ (2,956)	$ (792)	$ (5,358)
Net change	(1,345)	(156)	182	(524)	(87)	(1,930)
Balance, December 31, 2016	$ (1,267)	$ (767)	$ (895)	$ (3,480)	$ (879)	$ (7,288)
Net change	61	(293)	64	288	86	206
Balance, December 31, 2017	$ (1,206)	$ (1,060)	$ (831)	$ (3,192)	$ (793)	$ (7,082)
Accounting change related to certain tax effects [1]	**(393)**	**(220)**	**(189)**	**(707)**	**239**	**(1,270)**
Cumulative adjustment for hedge accounting change [2]	**—**	**—**	**57**	**—**	**—**	**57**
Net change	**(3,953)**	**749**	**(53)**	**(405)**	**(254)**	**(3,916)**
Balance, December 31, 2018	**$ (5,552)**	**$ (531)**	**$ (1,016)**	**$ (4,304)**	**$ (808)**	**$ (12,211)**

(1) Effective January 1, 2018, the Corporation adopted the accounting standard on tax effects in accumulated OCI related to the Tax Act. Accordingly, certain tax effects were reclassified from accumulated OCI to retained earnings. For additional information, see *Note 1 – Summary of Significant Accounting Principles*.

(2) Reflects the Corporation's adoption of the new hedge accounting standard. For additional information, see *Note 1 – Summary of Significant Accounting Principles*.

The table below presents the net change in fair value recorded in accumulated OCI, net realized gains and losses reclassified into earnings and other changes for each component of OCI pre- and after-tax for 2018, 2017 and 2016.

Changes in OCI Components Pre- and After-tax

(Dollars in millions)	2018 Pretax	2018 Tax effect	2018 After-tax	2017 Pretax	2017 Tax effect	2017 After-tax	2016 Pretax	2016 Tax effect	2016 After-tax
Debt and equity securities:									
Net increase (decrease) in fair value	**$ (5,189)**	**$ 1,329**	**$ (3,860)**	$ 240	$ 14	$ 254	$ (1,694)	$ 641	$ (1,053)
Net realized (gains) reclassified into earnings [1]	**(123)**	**30**	**(93)**	(304)	111	(193)	(471)	179	(292)
Net change	**(5,312)**	**1,359**	**(3,953)**	(64)	125	61	(2,165)	820	(1,345)
Debit valuation adjustments:									
Net increase (decrease) in fair value	**952**	**(224)**	**728**	(490)	171	(319)	(271)	104	(167)
Net realized losses reclassified into earnings [1]	**26**	**(5)**	**21**	42	(16)	26	17	(6)	11
Net change	**978**	**(229)**	**749**	(448)	155	(293)	(254)	98	(156)
Derivatives:									
Net (decrease) in fair value	**(232)**	**74**	**(158)**	(50)	1	(49)	(299)	113	(186)
Reclassifications into earnings:									
Net interest income	**165**	**(40)**	**125**	327	(122)	205	553	(205)	348
Personnel expense	**(27)**	**7**	**(20)**	(148)	56	(92)	32	(12)	20
Net realized losses reclassified into earnings	**138**	**(33)**	**105**	179	(66)	113	585	(217)	368
Net change	**(94)**	**41**	**(53)**	129	(65)	64	286	(104)	182
Employee benefit plans:									
Net increase (decrease) in fair value	**(703)**	**164**	**(539)**	223	(55)	168	(921)	329	(592)
Net actuarial losses and other reclassified into earnings [2]	**171**	**(46)**	**125**	179	(61)	118	97	(36)	61
Settlements, curtailments and other	**11**	**(2)**	**9**	3	(1)	2	15	(8)	7
Net change	**(521)**	**116**	**(405)**	405	(117)	288	(809)	285	(524)
Foreign currency:									
Net (decrease) in fair value	**(8)**	**(195)**	**(203)**	(439)	430	(9)	514	(601)	(87)
Net realized (gains) losses reclassified into earnings [1]	**(149)**	**98**	**(51)**	(606)	701	95	—	—	—
Net change	**(157)**	**(97)**	**(254)**	(1,045)	1,131	86	514	(601)	(87)
Total other comprehensive income (loss)	**$ (5,106)**	**$ 1,190**	**$ (3,916)**	$ (1,023)	$ 1,229	$ 206	$ (2,428)	$ 498	$ (1,930)

(1) Reclassifications of pretax debt and equity securities, DVA and foreign currency (gains) losses are recorded in other income in the Consolidated Statement of Income.

(2) Reclassifications of pretax employee benefit plan costs are recorded in other general operating expense in the Consolidated Statement of Income.

NOTE 15 Earnings Per Common Share

The calculation of EPS and diluted EPS for 2018, 2017 and 2016 is presented below. For more information on the calculation of EPS, see *Note 1 – Summary of Significant Accounting Principles*.

(In millions, except per share information)	2018	2017	2016
Earnings per common share			
Net income	**$ 28,147**	$ 18,232	$ 17,822
Preferred stock dividends	**(1,451)**	(1,614)	(1,682)
Net income applicable to common shareholders	**$ 26,696**	$ 16,618	$ 16,140
Average common shares issued and outstanding	**10,096.5**	10,195.6	10,284.1
Earnings per common share	**$ 2.64**	$ 1.63	$ 1.57
Diluted earnings per common share			
Net income applicable to common shareholders	**$ 26,696**	$ 16,618	$ 16,140
Add preferred stock dividends due to assumed conversions [1]	**—**	186	300
Net income allocated to common shareholders	**$ 26,696**	$ 16,804	$ 16,440
Average common shares issued and outstanding	**10,096.5**	10,195.6	10,284.1
Dilutive potential common shares [2]	**140.4**	582.8	762.7
Total diluted average common shares issued and outstanding	**10,236.9**	10,778.4	11,046.8
Diluted earnings per common share	**$ 2.61**	$ 1.56	$ 1.49

(1) Represents the Series T dividends under the "if-converted" method prior to conversion.
(2) Includes incremental dilutive shares from RSUs, restricted stock and warrants.

The Corporation previously issued warrants to purchase 700 million shares of the Corporation's common stock to the holders of the Series T 6% Non-cumulative preferred stock (Series T) at an exercise price of $7.142857 per share. On August 24, 2017, the Series T holders exercised the warrants and acquired the 700 million shares of the Corporation's common stock using the Series T preferred stock as consideration for the exercise price, which increased common shares outstanding, but had no effect on diluted earnings per share as this conversion was included in the Corporation's diluted earnings per share calculation under the applicable accounting guidance. For 2016, the average dilutive impact of the 700 million potential common shares was included in the diluted share count under the "if-converted" method.

For 2018, 2017 and 2016, 62 million average dilutive potential common shares associated with the Series L preferred stock were not included in the diluted share count because the result would have been antidilutive under the "if-converted" method. For 2018, 2017 and 2016, average options to purchase 4 million, 21 million and 45 million shares of common stock, respectively, were outstanding but not included in the computation of EPS because the result would have been antidilutive under the treasury stock method. For 2017 and 2016, average warrants to purchase 122 million shares of common stock were outstanding but not included in the computation of EPS because the result would have been antidilutive under the treasury stock method. These warrants expired on October 29, 2018. For 2018, 2017 and 2016, average warrants to purchase 136 million, 143 million and 150 million shares of common stock, respectively, were included in the diluted EPS calculation under the treasury stock method. Substantially all of the outstanding warrants were exercised on or before the expiration date of January 16, 2019.

NOTE 16 Regulatory Requirements and Restrictions

The Federal Reserve, Office of the Comptroller of the Currency (OCC) and FDIC (collectively, U.S. banking regulators) jointly establish regulatory capital adequacy guidelines, including Basel 3, for U.S. banking organizations. As a financial holding company, the Corporation is subject to capital adequacy rules issued by the Federal Reserve. The Corporation's banking entity affiliates are subject to capital adequacy rules issued by the OCC.

The Corporation and its primary banking entity affiliate, BANA, are Advanced approaches institutions under Basel 3. As Advanced approaches institutions, the Corporation and its banking entity affiliates are required to report regulatory risk-based capital ratios and risk-weighted assets under both the Standardized and Advanced approaches. The approach that yields the lower ratio is used to assess capital adequacy, including under the Prompt Corrective Action (PCA) framework. At December 31, 2018, Common equity tier 1 and Tier 1 capital ratios were lower under the Standardized approach whereas the Advanced approaches yielded a lower result for the Total capital ratio. All three ratios were lower under the Advanced approaches method at December 31, 2017.

Effective January 1, 2018, the Corporation is required to maintain a minimum supplementary leverage ratio (SLR) of 3.0 percent plus a leverage buffer of 2.0 percent in order to avoid certain restrictions on capital distributions and discretionary bonus payments. The Corporation's insured depository institution subsidiaries are required to maintain a minimum 6.0 percent SLR to be considered well capitalized under the PCA framework.

The following table presents capital ratios and related information in accordance with Basel 3 Standardized and Advanced approaches as measured at December 31, 2018 and 2017 for the Corporation and BANA.

Regulatory Capital under Basel 3 (1)

	Bank of America Corporation			Bank of America, N.A.		
(Dollars in millions, except as noted)	Standardized Approach	Advanced Approaches	Regulatory Minimum (2)	Standardized Approach	Advanced Approaches	Regulatory Minimum (3)
	December 31, 2018					
Risk-based capital metrics:						
Common equity tier 1 capital	**$ 167,272**	**$ 167,272**		**$ 149,824**	**$ 149,824**	
Tier 1 capital	**189,038**	**189,038**		**149,824**	**149,824**	
Total capital (4)	**221,304**	**212,878**		**161,760**	**153,627**	
Risk-weighted assets (in billions)	**1,437**	**1,409**		**1,195**	**959**	
Common equity tier 1 capital ratio	**11.6%**	**11.9%**	**8.25%**	**12.5%**	**15.6%**	**6.5%**
Tier 1 capital ratio	**13.2**	**13.4**	**9.75**	**12.5**	**15.6**	**8.0**
Total capital ratio	**15.4**	**15.1**	**11.75**	**13.5**	**16.0**	**10.0**
Leverage-based metrics:						
Adjusted quarterly average assets (in billions) (5)	**$ 2,258**	**$ 2,258**		**$ 1,719**	**$ 1,719**	
Tier 1 leverage ratio	**8.4%**	**8.4%**	**4.0**	**8.7%**	**8.7%**	**5.0**
SLR leverage exposure (in billions)		**$ 2,791**			**$ 2,112**	
SLR		**6.8%**	**5.0**		**7.1%**	**6.0**
	December 31, 2017					
Risk-based capital metrics:						
Common equity tier 1 capital	$ 171,063	$ 171,063		$ 150,552	$ 150,552	
Tier 1 capital	191,496	191,496		150,552	150,552	
Total capital (4)	227,427	218,529		163,243	154,675	
Risk-weighted assets (in billions)	1,434	1,449		1,201	1,007	
Common equity tier 1 capital ratio	11.9%	11.8%	7.25%	12.5%	14.9%	6.5%
Tier 1 capital ratio	13.4	13.2	8.75	12.5	14.9	8.0
Total capital ratio	15.9	15.1	10.75	13.6	15.4	10.0
Leverage-based metrics:						
Adjusted quarterly average assets (in billions) (5)	$ 2,224	$ 2,224		$ 1,672	$ 1,672	
Tier 1 leverage ratio	8.6%	8.6%	4.0	9.0%	9.0%	5.0

(1) Regulatory capital metrics at December 31, 2017 reflect Basel 3 transition provisions for regulatory capital adjustments and deductions, which were fully phased-in as of January 1, 2018.
(2) The December 31, 2018 and 2017 amounts include a transition capital conservation buffer of 1.875 percent and 1.25 percent and a transition global systemically important bank surcharge of 1.875 percent and 1.5 percent. The countercyclical capital buffer for both periods is zero.
(3) Percent required to meet guidelines to be considered "well capitalized" under the PCA framework.
(4) Total capital under the Advanced approaches differs from the Standardized approach due to differences in the amount permitted in Tier 2 capital related to the qualifying allowance for credit losses.
(5) Reflects adjusted average total assets for the three months ended December 31, 2018 and 2017.

The capital adequacy rules issued by the U.S. banking regulators require institutions to meet the established minimums outlined in the table above. Failure to meet the minimum requirements can lead to certain mandatory and discretionary actions by regulators that could have a material adverse impact on the Corporation's financial position. At December 31, 2018 and 2017, the Corporation and its banking entity affiliates were "well capitalized."

Other Regulatory Matters

The Federal Reserve requires the Corporation's bank subsidiaries to maintain reserve requirements based on a percentage of certain deposit liabilities. The average daily reserve balance requirements, in excess of vault cash, maintained by the Corporation with the Federal Reserve Bank were $11.4 billion and $8.9 billion for 2018 and 2017. At December 31, 2018 and 2017, the Corporation had cash and cash equivalents in the amount of $5.8 billion and $4.1 billion, and securities with a fair value of $16.6 billion and $17.3 billion that were segregated in compliance with securities regulations. Cash held on deposit with the Federal Reserve Bank to meet reserve requirements and cash and cash equivalents segregated in compliance with securities regulations are components of restricted cash. For additional information, see *Note 10 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash*. In addition, at December 31, 2018 and 2017, the Corporation had cash deposited with clearing organizations of $8.1 billion and $11.9 billion primarily recorded in other assets on the Consolidated Balance Sheet.

Bank Subsidiary Distributions

The primary sources of funds for cash distributions by the Corporation to its shareholders are capital distributions received from its bank subsidiaries, BANA and Bank of America California, N.A. In 2018, the Corporation received dividends of $26.1 billion from BANA and $320 million from Bank of America California, N.A. In addition, Bank of America California, N.A. returned capital of $1.4 billion to the Corporation in 2018.

The amount of dividends that a subsidiary bank may declare in a calendar year without OCC approval is the subsidiary bank's net profits for that year combined with its retained net profits for the preceding two years. Retained net profits, as defined by the OCC, consist of net income less dividends declared during the period. In 2019, BANA can declare and pay dividends of approximately $3.1 billion to the Corporation plus an additional amount equal to its retained net profits for 2019 up to the date of any such dividend declaration. Bank of America California, N.A. can pay dividends of $40 million in 2019 plus an additional amount equal to its retained net profits for 2019 up to the date of any such dividend declaration.

NOTE 17 Employee Benefit Plans

Pension and Postretirement Plans

The Corporation sponsors a qualified noncontributory trusteed pension plan (Qualified Pension Plan), a number of noncontributory nonqualified pension plans, and postretirement health and life plans that cover eligible employees. Non-U.S. pension plans sponsored by the Corporation vary based on the country and local practices.

The Qualified Pension Plan has a balance guarantee feature for account balances with participant-selected investments, applied at the time a benefit payment is made from the plan that effectively provides principal protection for participant balances transferred and certain compensation credits. The Corporation is responsible for funding any shortfall on the guarantee feature.

Benefits earned under the Qualified Pension Plan have been frozen. Thereafter, the cash balance accounts continue to earn investment credits or interest credits in accordance with the terms of the plan document.

The Corporation has an annuity contract that guarantees the payment of benefits vested under a terminated U.S. pension plan (Other Pension Plan). The Corporation, under a supplemental agreement, may be responsible for, or benefit from actual experience and investment performance of the annuity assets. The Corporation made no contribution under this agreement in 2018 or 2017. Contributions may be required in the future under this agreement.

The Corporation's noncontributory, nonqualified pension plans are unfunded and provide supplemental defined pension benefits to certain eligible employees.

In addition to retirement pension benefits, certain benefits-eligible employees may become eligible to continue participation as retirees in health care and/or life insurance plans sponsored by the Corporation. These plans are referred to as the Postretirement Health and Life Plans. During 2017, the Corporation established and funded a Voluntary Employees' Beneficiary Association trust in the amount of $300 million for the Postretirement Health and Life Plans.

The Pension and Postretirement Plans table summarizes the changes in the fair value of plan assets, changes in the projected benefit obligation (PBO), the funded status of both the accumulated benefit obligation (ABO) and the PBO, and the weighted-average assumptions used to determine benefit obligations for the pension plans and postretirement plans at December 31, 2018 and 2017. The estimate of the Corporation's PBO associated with these plans considers various actuarial assumptions, including assumptions for mortality rates and discount rates. The discount rate assumptions are derived from a cash flow matching technique that utilizes rates that are based on Aa-rated corporate bonds with cash flows that match estimated benefit payments of each of the plans. The increases in the weighted-average discount rates in 2018 resulted in decreases to the PBO of approximately $1.3 billion at December 31, 2018. The decreases in the weighted-average discount rates in 2017 resulted in increases to the PBO of approximately $1.1 billion at December 31, 2017. Significant gains and losses related to changes in the PBO for 2018 and 2017 primarily resulted from changes in the discount rate.

Pension and Postretirement Plans [(1)]

	Qualified Pension Plan		Non-U.S. Pension Plans		Nonqualified and Other Pension Plans		Postretirement Health and Life Plans	
(Dollars in millions)	2018	2017	2018	2017	2018	2017	2018	2017
Fair value, January 1	**$ 19,708**	$ 18,239	**$ 2,943**	$ 2,789	**$ 2,724**	$ 2,744	**$ 300**	$ —
Actual return on plan assets	**(550)**	2,285	**(181)**	118	**8**	128	**5**	—
Company contributions	**—**	—	**22**	23	**91**	98	**43**	393
Plan participant contributions	**—**	—	**1**	1	**—**	—	**115**	125
Settlements and curtailments	**—**	—	**(107)**	(190)	**—**	—	**—**	—
Benefits paid	**(980)**	(816)	**(52)**	(54)	**(239)**	(246)	**(214)**	(230)
Federal subsidy on benefits paid	**n/a**	n/a	**n/a**	n/a	**n/a**	n/a	**3**	12
Foreign currency exchange rate changes	**n/a**	n/a	**(165)**	256	**n/a**	n/a	**n/a**	n/a
Fair value, December 31	**$ 18,178**	$ 19,708	**$ 2,461**	$ 2,943	**$ 2,584**	$ 2,724	**$ 252**	$ 300
Change in projected benefit obligation								
Projected benefit obligation, January 1	**$ 15,706**	$ 14,982	**$ 2,814**	$ 2,763	**$ 3,047**	$ 3,047	**$ 1,056**	$ 1,125
Service cost	**—**	—	**19**	24	**1**	1	**6**	6
Interest cost	**563**	606	**65**	72	**105**	117	**36**	43
Plan participant contributions	**—**	—	**1**	1	**—**	—	**115**	125
Plan amendments	**—**	—	**13**	—	**—**	—	**—**	(19)
Settlements and curtailments	**—**	—	**(107)**	(200)	**—**	—	**—**	—
Actuarial loss (gain)	**(1,145)**	934	**(29)**	(26)	**(135)**	128	**(73)**	(7)
Benefits paid	**(980)**	(816)	**(52)**	(54)	**(239)**	(246)	**(214)**	(230)
Federal subsidy on benefits paid	**n/a**	n/a	**n/a**	n/a	**n/a**	n/a	**3**	12
Foreign currency exchange rate changes	**n/a**	n/a	**(135)**	234	**n/a**	n/a	**(1)**	1
Projected benefit obligation, December 31	**$ 14,144**	$ 15,706	**$ 2,589**	$ 2,814	**$ 2,779**	$ 3,047	**$ 928**	$ 1,056
Amounts recognized on Consolidated Balance Sheet								
Other assets	**$ 4,034**	$ 4,002	**$ 316**	$ 610	**$ 754**	$ 730	**$ —**	$ —
Accrued expenses and other liabilities	**—**	—	**(444)**	(481)	**(949)**	(1,053)	**(676)**	(756)
Net amount recognized, December 31	**$ 4,034**	$ 4,002	**$ (128)**	$ 129	**$ (195)**	$ (323)	**$ (676)**	$ (756)
Funded status, December 31								
Accumulated benefit obligation	**$ 14,144**	$ 15,706	**$ 2,542**	$ 2,731	**$ 2,778**	$ 3,046	**n/a**	n/a
Overfunded (unfunded) status of ABO	**4,034**	4,002	**(81)**	212	**(194)**	(322)	**n/a**	n/a
Provision for future salaries	**—**	—	**47**	83	**1**	1	**n/a**	n/a
Projected benefit obligation	**14,144**	15,706	**2,589**	2,814	**2,779**	3,047	**$ 928**	$ 1,056
Weighted-average assumptions, December 31								
Discount rate	**4.32%**	3.68%	**2.60%**	2.39%	**4.26%**	3.58%	**4.25%**	3.58%
Rate of compensation increase	**n/a**	n/a	**4.49**	4.31	**4.00**	4.00	**n/a**	n/a
Interest-crediting rate	**5.18**	5.08	**1.47**	1.49	**4.50**	4.53	**n/a**	n/a

(1) The measurement date for the Qualified Pension Plan, Non-U.S. Pension Plans, Nonqualified and Other Pension Plans, and Postretirement Health and Life Plans was December 31 of each year reported.

n/a = not applicable

The Corporation's estimate of its contributions to be made to the Non-U.S. Pension Plans, Nonqualified and Other Pension Plans, and Postretirement Health and Life Plans in 2019 is $21 million, $91 million and $15 million, respectively. The Corporation does not expect to make a contribution to the Qualified Pension Plan in 2019. It is the policy of the Corporation to fund no less than the minimum funding amount required by the Employee Retirement Income Security Act of 1974 (ERISA).

Pension Plans with ABO and PBO in excess of plan assets as of December 31, 2018 and 2017 are presented in the table below. For these plans, funding strategies vary due to legal requirements and local practices.

Plans with ABO and PBO in Excess of Plan Assets

(Dollars in millions)	Non-U.S. Pension Plans		Nonqualified and Other Pension Plans	
	2018	2017	**2018**	2017
PBO	**$ 615**	$ 671	**$ 950**	$ 1,054
ABO	**605**	644	**949**	1,053
Fair value of plan assets	**173**	191	**1**	1

Components of Net Periodic Benefit Cost

(Dollars in millions)	Qualified Pension Plan			Non-U.S. Pension Plans		
	2018	2017	2016	**2018**	2017	2016
Components of net periodic benefit cost (income)						
Service cost	**$ —**	$ —	$ —	**$ 19**	$ 24	$ 25
Interest cost	**563**	606	634	**65**	72	86
Expected return on plan assets	**(1,136)**	(1,068)	(1,038)	**(126)**	(136)	(123)
Amortization of net actuarial loss	**147**	154	139	**10**	8	6
Other	**—**	—	—	**12**	(7)	2
Net periodic benefit cost (income)	**$ (426)**	$ (308)	$ (265)	**$ (20)**	$ (39)	$ (4)
Weighted-average assumptions used to determine net cost for years ended December 31						
Discount rate	**3.68%**	4.16%	4.51%	**2.39%**	2.56%	3.59%
Expected return on plan assets	**6.00**	6.00	6.00	**4.37**	4.73	4.84
Rate of compensation increase	**n/a**	n/a	n/a	**4.31**	4.51	4.67

(Dollars in millions)	Nonqualified and Other Pension Plans			Postretirement Health and Life Plans		
	2018	2017	2016	**2018**	2017	2016
Components of net periodic benefit cost (income)						
Service cost	**$ 1**	$ 1	$ —	**$ 6**	$ 6	$ 7
Interest cost	**105**	117	127	**36**	43	47
Expected return on plan assets	**(84)**	(95)	(101)	**(6)**	—	—
Amortization of net actuarial loss (gain)	**43**	34	25	**(27)**	(21)	(81)
Other	**—**	—	3	**(3)**	4	4
Net periodic benefit cost (income)	**$ 65**	$ 57	$ 54	**$ 6**	$ 32	$ (23)
Weighted-average assumptions used to determine net cost for years ended December 31						
Discount rate	**3.58%**	4.01%	4.34%	**3.58%**	3.99%	4.32%
Expected return on plan assets	**3.19**	3.50	3.66	**2.00**	n/a	n/a
Rate of compensation increase	**4.00**	4.00	4.00	**n/a**	n/a	n/a

n/a = not applicable

The asset valuation method used to calculate the expected return on plan assets component of net periodic benefit cost for the Qualified Pension Plan recognizes 60 percent of the prior year's market gains or losses at the next measurement date with the remaining 40 percent spread equally over the subsequent four years.

Gains and losses for all benefit plans except postretirement health care are recognized in accordance with the standard amortization provisions of the applicable accounting guidance. Net periodic postretirement health and life expense was determined using the "projected unit credit" actuarial method. For the Postretirement Health and Life Plans, 50 percent of the unrecognized gain or loss at the beginning of the fiscal year (or at subsequent remeasurement) is recognized on a level basis during the year.

Assumed health care cost trend rates affect the postretirement benefit obligation and benefit cost reported for the Postretirement Health and Life Plans. The assumed health care cost trend rate used to measure the expected cost of benefits covered by the Postretirement Health and Life Plans is 6.50 percent for 2019, reducing in steps to 5.00 percent in 2023 and later years.

The Corporation's net periodic benefit cost (income) recognized for the plans is sensitive to the discount rate and expected return on plan assets. For the Qualified Pension Plan, Non-U.S. Pension Plans, Nonqualified and Other Pension Plans, and Postretirement Health and Life Plans, a 25 bp decline in discount rates and expected return on assets would not have a significant impact on the net periodic benefit cost for 2018.

Pretax Amounts included in Accumulated OCI

(Dollars in millions)	Qualified Pension Plan 2018	2017	Non-U.S. Pension Plans 2018	2017	Nonqualified and Other Pension Plans 2018	2017	Postretirement Health and Life Plans 2018	2017	Total 2018	2017
Net actuarial loss (gain)	**$ 4,386**	$ 3,992	**$ 454**	$ 196	**$ 912**	$ 1,014	**$ (75)**	$ (30)	**$ 5,677**	$ 5,172
Prior service cost (credits)	**—**	—	**18**	4	**—**	—	**(9)**	(11)	**9**	(7)
Amounts recognized in accumulated OCI	**$ 4,386**	$ 3,992	**$ 472**	$ 200	**$ 912**	$ 1,014	**$ (84)**	$ (41)	**$ 5,686**	$ 5,165

Pretax Amounts Recognized in OCI

(Dollars in millions)	Qualified Pension Plan 2018	2017	Non-U.S. Pension Plans 2018	2017	Nonqualified and Other Pension Plans 2018	2017	Postretirement Health and Life Plans 2018	2017	Total 2018	2017
Current year actuarial loss (gain)	**$ 541**	$ (283)	**$ 270**	$ (12)	**$ (59)**	$ 95	**$ (73)**	$ (7)	**$ 679**	$ (207)
Amortization of actuarial gain (loss) and prior service cost	**(147)**	(154)	**(11)**	(8)	**(43)**	(34)	**30**	21	**(171)**	(175)
Current year prior service cost (credit)	**—**	—	**13**	—	**—**	—	**—**	(23)	**13**	(23)
Amounts recognized in OCI	**$ 394**	$ (437)	**$ 272**	$ (20)	**$ (102)**	$ 61	**$ (43)**	$ (9)	**$ 521**	$ (405)

Plan Assets

The Qualified Pension Plan has been established as a retirement vehicle for participants, and trusts have been established to secure benefits promised under the Qualified Pension Plan. The Corporation's policy is to invest the trust assets in a prudent manner for the exclusive purpose of providing benefits to participants and defraying reasonable expenses of administration. The Corporation's investment strategy is designed to provide a total return that, over the long term, increases the ratio of assets to liabilities. The strategy attempts to maximize the investment return on assets at a level of risk deemed appropriate by the Corporation while complying with ERISA and any applicable regulations and laws. The investment strategy utilizes asset allocation as a principal determinant for establishing the risk/return profile of the assets. Asset allocation ranges are established, periodically reviewed and adjusted as funding levels and liability characteristics change. Active and passive investment managers are employed to help enhance the risk/return profile of the assets. An additional aspect of the investment strategy used to minimize risk (part of the asset allocation plan) includes matching the exposure of participant-selected investment measures.

The assets of the Non-U.S. Pension Plans are primarily attributable to a U.K. pension plan. This U.K. pension plan's assets are invested prudently so that the benefits promised to members are provided with consideration given to the nature and the duration of the plan's liabilities. The selected asset allocation strategy is designed to achieve a higher return than the lowest risk strategy.

The expected rate of return on plan assets assumption was developed through analysis of historical market returns, historical asset class volatility and correlations, current market conditions, anticipated future asset allocations, the funds' past experience, and expectations on potential future market returns. The expected return on plan assets assumption is determined using the calculated market-related value for the Qualified Pension Plan and the Other Pension Plan and the fair value for the Non-U.S. Pension Plans and Postretirement Health and Life Plans. The expected return on plan assets assumption represents a long-term average view of the performance of the assets in the Qualified Pension Plan, the Non-U.S. Pension Plans, the Other Pension Plan, and Postretirement Health and Life Plans, a return that may or may not be achieved during any one calendar year. The Other Pension Plan is invested solely in an annuity contract which is primarily invested in fixed-income securities structured such that asset maturities match the duration of the plan's obligations.

The target allocations for 2019 by asset category for the Qualified Pension Plan, Non-U.S. Pension Plans, and Nonqualified and Other Pension Plans are presented in the following table. Equity securities for the Qualified Pension Plan include common stock of the Corporation in the amounts of $221 million (1.22 percent of total plan assets) and $261 million (1.33 percent of total plan assets) at December 31, 2018 and 2017.

2019 Target Allocation

	Percentage		
Asset Category	**Qualified Pension Plan**	**Non-U.S. Pension Plans**	**Nonqualified and Other Pension Plans**
Equity securities	20-50	5-35	0-5
Debt securities	45-75	40-80	95-100
Real estate	0-10	0-15	0-5
Other	0-5	5-30	0-5

Fair Value Measurements

For more information on fair value measurements, including descriptions of Level 1, 2 and 3 of the fair value hierarchy and the valuation methods employed by the Corporation, see *Note 1 – Summary of Significant Accounting Principles* and *Note 20 – Fair Value Measurements*. Combined plan investment assets measured at fair value by level and in total at December 31, 2018 and 2017 are summarized in the Fair Value Measurements table.

Fair Value Measurements

(Dollars in millions)	Level 1	Level 2	Level 3	Total
	December 31, 2018			
Cash and short-term investments				
Money market and interest-bearing cash	$ 1,530	$ —	$ —	$ 1,530
Cash and cash equivalent commingled/mutual funds	—	644	—	644
Fixed income				
U.S. government and agency securities	3,637	805	9	4,451
Corporate debt securities	—	2,852	—	2,852
Asset-backed securities	—	2,119	—	2,119
Non-U.S. debt securities	539	961	—	1,500
Fixed income commingled/mutual funds	933	1,177	—	2,110
Equity				
Common and preferred equity securities	4,414	—	—	4,414
Equity commingled/mutual funds	288	1,275	—	1,563
Public real estate investment trusts	104	—	—	104
Real estate				
Private real estate	—	—	5	5
Real estate commingled/mutual funds	—	13	885	898
Limited partnerships	—	158	82	240
Other investments [(1)]	93	364	588	1,045
Total plan investment assets, at fair value	$ 11,538	$ 10,368	$ 1,569	$ 23,475
	December 31, 2017			
Cash and short-term investments				
Money market and interest-bearing cash	$ 2,190	$ —	$ —	$ 2,190
Cash and cash equivalent commingled/mutual funds	—	1,004	—	1,004
Fixed income				
U.S. government and agency securities	3,331	854	9	4,194
Corporate debt securities	—	2,417	—	2,417
Asset-backed securities	—	1,832	—	1,832
Non-U.S. debt securities	693	898	—	1,591
Fixed income commingled/mutual funds	775	1,676	—	2,451
Equity				
Common and preferred equity securities	5,833	—	—	5,833
Equity commingled/mutual funds	271	1,753	—	2,024
Public real estate investment trusts	138	—	—	138
Real estate				
Private real estate	—	—	93	93
Real estate commingled/mutual funds	—	13	831	844
Limited partnerships	—	155	85	240
Other investments [(1)]	101	649	74	824
Total plan investment assets, at fair value	$ 13,332	$ 11,251	$ 1,092	$ 25,675

(1) Other investments include commodity and balanced funds of $305 million and $451 million, insurance annuity contracts of $562 million and $50 million and other various investments of $178 million and $323 million at December 31, 2018 and 2017.

The Level 3 Fair Value Measurements table presents a reconciliation of all plan investment assets measured at fair value using significant unobservable inputs (Level 3) during 2018, 2017 and 2016.

Level 3 Fair Value Measurements

(Dollars in millions)	Balance January 1	Actual Return on Plan Assets Still Held at the Reporting Date	Purchases, Sales and Settlements	Balance December 31
	2018			
Fixed income				
U.S. government and agency securities	$ 9	$ —	$ —	$ 9
Real estate				
Private real estate	93	(7)	(81)	5
Real estate commingled/mutual funds	831	52	2	885
Limited partnerships	85	(12)	9	82
Other investments	74	—	514	588
Total	$ 1,092	$ 33	$ 444	$ 1,569
	2017			
Fixed income				
U.S. government and agency securities	$ 10	$ —	$ (1)	$ 9
Real estate				
Private real estate	150	8	(65)	93
Real estate commingled/mutual funds	748	63	20	831
Limited partnerships	38	14	33	85
Other investments	83	5	(14)	74
Total	$ 1,029	$ 90	$ (27)	$ 1,092
	2016			
Fixed income				
U.S. government and agency securities	$ 11	$ —	$ (1)	$ 10
Real estate				
Private real estate	144	1	5	150
Real estate commingled/mutual funds	731	21	(4)	748
Limited partnerships	49	(2)	(9)	38
Other investments	102	4	(23)	83
Total	$ 1,037	$ 24	$ (32)	$ 1,029

Projected Benefit Payments

Benefit payments projected to be made from the Qualified Pension Plan, Non-U.S. Pension Plans, Nonqualified and Other Pension Plans, and Postretirement Health and Life Plans are presented in the table below.

Projected Benefit Payments

(Dollars in millions)	Qualified Pension Plan (1)	Non-U.S. Pension Plans (2)	Nonqualified and Other Pension Plans (2)	Postretirement Health and Life Plans (3)
2019	$ 905	$ 98	$ 241	$ 85
2020	932	103	244	82
2021	920	110	239	79
2022	925	119	234	77
2023	915	125	228	74
2024 - 2028	4,451	671	1,046	323

(1) Benefit payments expected to be made from the plan's assets.
(2) Benefit payments expected to be made from a combination of the plans' and the Corporation's assets.
(3) Benefit payments (net of retiree contributions) expected to be made from a combination of the plans' and the Corporation's assets.

Defined Contribution Plans

The Corporation maintains qualified and non-qualified defined contribution retirement plans. The Corporation recorded expense of $1.0 billion in each of 2018, 2017, and 2016 related to the qualified defined contribution plans. At December 31, 2018 and 2017, 212 million and 218 million shares of the Corporation's common stock were held by these plans. Payments to the plans for dividends on common stock were $115 million, $86 million and $60 million in 2018, 2017 and 2016, respectively.

Certain non-U.S. employees are covered under defined contribution pension plans that are separately administered in accordance with local laws.

NOTE 18 Stock-based Compensation Plans

The Corporation administers a number of equity compensation plans, with awards being granted predominantly from the Bank of America Key Employee Equity Plan (KEEP). Under this plan, 450 million shares of the Corporation's common stock are authorized to be used for grants of awards.

During 2018 and 2017, the Corporation granted 71 million and 85 million RSU awards to certain employees under the KEEP. The RSUs were authorized to settle predominantly in shares of common stock of the Corporation. Certain RSUs will be settled in cash or contain settlement provisions that subject these awards to variable accounting whereby compensation expense is adjusted to fair value based on changes in the share price of the Corporation's common stock up to the settlement date. Of the RSUs granted in 2018 and 2017, 63 million and 85 million will vest in one-third increments on each of the first three anniversaries of the grant date provided that the employee remains continuously employed with the Corporation during that time, and will be expensed ratably over the vesting period, net of estimated forfeitures, for non-retirement eligible employees based on the grant-date fair value of the shares. Additionally, eight million of the RSUs granted in 2018 will vest in one-fourth increments on each of the first four anniversaries of the grant date provided that the employee remains continuously employed with the Corporation during that time, and will be expensed ratably over the vesting period, net of estimated forfeitures, based on the grant-date fair value of the shares. Awards granted in years prior to 2016 were predominantly cash settled.

Effective October 1, 2017, the Corporation changed its accounting method for determining when stock-based compensation awards granted to retirement-eligible employees are deemed authorized, changing from the grant date to the beginning of the year preceding the grant date when the incentive award plans are generally approved. As a result, the estimated value of the awards is expensed ratably over the year preceding the grant date. The compensation cost for all periods prior to this change presented herein has been restated.

The compensation cost for the stock-based plans was $1.8 billion, $2.2 billion and $2.2 billion and the related income tax benefit was $433 million, $829 million and $835 million for 2018, 2017 and 2016, respectively.

Restricted Stock/Units

The table below presents the status at December 31, 2018 of the share-settled restricted stock/units and changes during 2018.

Stock-settled Restricted Stock/Units

	Shares/Units	Weighted-average Grant Date Fair Value
Outstanding at January 1, 2018	179,273,243	$ 17.53
Granted	68,899,627	30.53
Vested	(74,357,624)	16.31
Canceled	(8,194,000)	22.84
Outstanding at December 31, 2018	**165,621,246**	**23.22**

The table below presents the status at December 31, 2018 of the cash-settled RSUs granted under the KEEP and changes during 2018.

Cash-settled Restricted Units

	Units
Outstanding at January 1, 2018	42,209,626
Granted	2,195,025
Vested	(41,434,793)
Canceled	(360,736)
Outstanding at December 31, 2018	**2,609,122**

At December 31, 2018, there was an estimated $1.1 billion of total unrecognized compensation cost related to certain share-based compensation awards that is expected to be recognized over a period of up to four years, with a weighted-average period of 1.9 years. The total fair value of restricted stock vested in 2018, 2017 and 2016 was $2.3 billion, $1.3 billion and $358 million, respectively. In 2018, 2017 and 2016, the amount of cash paid to settle equity-based awards for all equity compensation plans was $1.3 billion, $1.9 billion and $1.7 billion, respectively.

Stock Options

Of the 16.6 million stock options with a weighted-average exercise price of $43.44 outstanding at January 1, 2018, 2.1 million and 14.5 million were exercised and forfeited during 2018 at weighted-average exercise prices of $30.71 and $45.29. There were no outstanding stock options at December 31, 2018.

NOTE 19 Income Taxes

The components of income tax expense for 2018, 2017 and 2016 are presented in the table below.

Income Tax Expense

(Dollars in millions)	2018	2017	2016
Current income tax expense			
U.S. federal	**$ 816**	$ 1,310	$ 302
U.S. state and local	**1,377**	557	120
Non-U.S.	**1,203**	939	984
Total current expense	**3,396**	2,806	1,406
Deferred income tax expense			
U.S. federal	**2,579**	7,238	5,416
U.S. state and local	**240**	835	(279)
Non-U.S.	**222**	102	656
Total deferred expense	**3,041**	8,175	5,793
Total income tax expense	**$ 6,437**	$ 10,981	$ 7,199

Total income tax expense does not reflect the tax effects of items that are included in OCI each period. For more information, see *Note 14 – Accumulated Other Comprehensive Income (Loss)*. Other tax effects included in OCI each period resulted in a benefit of $1.2 billion, $1.2 billion and $498 million in 2018, 2017 and 2016, respectively. In addition, prior to 2017, total income tax expense did not reflect tax effects associated with the Corporation's employee stock plans which decreased common stock and additional paid-in capital $41 million in 2016.

Income tax expense for 2018, 2017 and 2016 varied from the amount computed by applying the statutory income tax rate to income before income taxes. The Corporation's federal statutory tax rate was 21 percent for 2018 and 35 percent for 2017 and 2016. A reconciliation of the expected U.S. federal income tax expense, calculated by applying the federal statutory tax rate, to the Corporation's actual income tax expense, and the effective tax rates for 2018, 2017 and 2016 are presented in the table below.

On December 22, 2017, the President signed into law the Tax Act which made significant changes to federal income tax law including, among other things, reducing the statutory corporate income tax rate to 21 percent from 35 percent and changing the taxation of the Corporation's non-U.S. business activities. The impact on net income in 2017 was $2.9 billion, driven by $2.3 billion in income tax expense, largely from a lower valuation of certain U.S. deferred tax assets and liabilities. The change in the statutory tax rate also impacted the Corporation's tax-advantaged energy investments, resulting in a downward valuation adjustment of $946 million recorded in other income and a related income tax benefit of $347 million, which when netted against the $2.3 billion, resulted in a net impact on income tax expense of $1.9 billion. The Corporation has completed its analysis and accounting under Staff Accounting Bulletin No. 118 for the effects of the Tax Act.

Reconciliation of Income Tax Expense

	2018		2017		2016	
(Dollars in millions)	**Amount**	**Percent**	Amount	Percent	Amount	Percent
Expected U.S. federal income tax expense	**$ 7,263**	**21.0%**	$ 10,225	35.0%	$ 8,757	35.0%
Increase (decrease) in taxes resulting from:						
State tax expense, net of federal benefit	**1,367**	**4.0**	881	3.0	420	1.7
Affordable housing/energy/other credits	**(1,888)**	**(5.5)**	(1,406)	(4.8)	(1,203)	(4.8)
Tax-exempt income, including dividends	**(413)**	**(1.2)**	(672)	(2.3)	(562)	(2.2)
Share-based compensation	**(257)**	**(0.7)**	(236)	(0.8)	—	—
Nondeductible expenses	**302**	**0.9**	97	0.3	180	0.7
Changes in prior-period UTBs, including interest	**144**	**0.4**	133	0.5	(328)	(1.3)
Rate differential on non-US earnings	**98**	**0.3**	(272)	(0.9)	(307)	(1.2)
Tax law changes [(1)]	**—**	**—**	2,281	7.8	348	1.4
Other	**(179)**	**(0.6)**	(50)	(0.2)	(106)	(0.5)
Total income tax expense	**$ 6,437**	**18.6%**	$ 10,981	37.6%	$ 7,199	28.8%

(1) Amounts for 2016 are for non-U.S. tax law changes.

The reconciliation of the beginning unrecognized tax benefits (UTB) balance to the ending balance is presented in the following table.

Reconciliation of the Change in Unrecognized Tax Benefits

(Dollars in millions)	**2018**	2017	2016
Balance, January 1	**$ 1,773**	$ 875	$ 1,095
Increases related to positions taken during the current year	**395**	292	104
Increases related to positions taken during prior years	**406**	750	1,318
Decreases related to positions taken during prior years	**(371)**	(122)	(1,091)
Settlements	**(6)**	(17)	(503)
Expiration of statute of limitations	**—**	(5)	(48)
Balance, December 31	**$ 2,197**	$ 1,773	$ 875

At December 31, 2018, 2017 and 2016, the balance of the Corporation's UTBs which would, if recognized, affect the Corporation's effective tax rate was $1.6 billion, $1.2 billion and $0.6 billion, respectively. Included in the UTB balance are some items the recognition of which would not affect the effective tax rate, such as the tax effect of certain temporary differences, the portion of gross state UTBs that would be offset by the tax benefit of the associated federal deduction and the portion of gross non-U.S. UTBs that would be offset by tax reductions in other jurisdictions.

The Corporation files income tax returns in more than 100 state and non-U.S. jurisdictions each year. The IRS and other tax authorities in countries and states in which the Corporation has significant business operations examine tax returns periodically (continuously in some jurisdictions). The following table summarizes the status of examinations by major jurisdiction for the Corporation and various subsidiaries at December 31, 2018.

Tax Examination Status

	Years under Examination [(1)]	**Status at December 31 2018**
United States	2012 – 2013	IRS Appeals
United States	2014 – 2016	Field examination
New York	2015	Field examination
United Kingdom	2017	To begin in 2019

(1) All tax years subsequent to the years shown remain subject to examination.

It is reasonably possible that the UTB balance may decrease by as much as $1.2 billion during the next 12 months, since resolved items will be removed from the balance whether their resolution results in payment or recognition.

The Corporation recognized interest expense of $43 million, $1 million and $56 million in 2018, 2017 and 2016, respectively. At December 31, 2018 and 2017, the Corporation's accrual for interest and penalties that related to income taxes, net of taxes and remittances, was $218 million and $185 million.

Significant components of the Corporation's net deferred tax assets and liabilities at December 31, 2018 and 2017 are presented in the following table.

Deferred Tax Assets and Liabilities

	December 31	
(Dollars in millions)	2018	2017
Deferred tax assets		
Net operating loss carryforwards	$ 7,993	$ 8,506
Allowance for credit losses	2,400	2,598
Accrued expenses	1,875	2,021
Available-for-sale securities	1,854	510
Security, loan and debt valuations	1,818	2,939
Employee compensation and retirement benefits	1,564	1,705
Credit carryforwards	623	1,793
Other	1,037	1,034
Gross deferred tax assets	19,164	21,106
Valuation allowance	(1,569)	(1,644)
Total deferred tax assets, net of valuation allowance	17,595	19,462
Deferred tax liabilities		
Equipment lease financing	2,684	2,492
Fixed assets	1,104	840
Tax credit investments	940	734
Other	2,126	2,771
Gross deferred tax liabilities	6,854	6,837
Net deferred tax assets, net of valuation allowance	$ 10,741	$ 12,625

The table below summarizes the deferred tax assets and related valuation allowances recognized for the net operating loss (NOL) and tax credit carryforwards at December 31, 2018.

Net Operating Loss and Tax Credit Carryforward Deferred Tax Assets

(Dollars in millions)	Deferred Tax Asset	Valuation Allowance	Net Deferred Tax Asset	First Year Expiring
Net operating losses - U.S.	$ 592	$ —	$ 592	After 2027
Net operating losses - U.K. [(1)]	5,294	—	5,294	None
Net operating losses - other non-U.S.	633	(517)	116	Various
Net operating losses - U.S. states [(2)]	1,474	(517)	957	Various
General business credits	612	—	612	After 2038
Foreign tax credits	11	(11)	—	n/a

(1) Represents U.K. broker-dealer net operating losses that may be carried forward indefinitely.
(2) The net operating losses and related valuation allowances for U.S. states before considering the benefit of federal deductions were $1.9 billion and $654 million.
n/a = not applicable

Management concluded that no valuation allowance was necessary to reduce the deferred tax assets related to the U.K. NOL carryforwards and U.S. NOL and general business credit carryforwards since estimated future taxable income will be sufficient to utilize these assets prior to their expiration. The majority of the Corporation's U.K. net deferred tax assets, which consist primarily of NOLs, are expected to be realized by certain subsidiaries over an extended number of years. Management's conclusion is supported by financial results, profit forecasts for the relevant entities and the indefinite period to carry forward NOLs. However, a material change in those estimates could lead management to reassess such valuation allowance conclusions.

At December 31, 2018, U.S. federal income taxes had not been provided on approximately $5 billion of temporary differences associated with investments in non-U.S. subsidiaries that are essentially permanent in duration. If the Corporation were to record the associated deferred tax liability, the amount would be approximately $1 billion.

NOTE 20 Fair Value Measurements

Under applicable accounting standards, fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The Corporation determines the fair values of its financial instruments under applicable accounting standards that require an entity to maximize the use of observable inputs and minimize the use of unobservable inputs. The Corporation categorizes its financial instruments into three levels based on the established fair value hierarchy. The Corporation conducts a review of its fair value hierarchy classifications on a quarterly basis. Transfers into or out of fair value hierarchy classifications are made if the significant inputs used in the financial models measuring the fair values of the assets and liabilities became unobservable or observable in the current marketplace. For more information regarding the fair value hierarchy and how the Corporation measures fair value, see *Note 1 – Summary of Significant Accounting Principles*. The Corporation accounts for certain financial instruments under the fair value option. For additional information, see *Note 21 – Fair Value Option*.

Valuation Techniques

The following sections outline the valuation methodologies for the Corporation's assets and liabilities. While the Corporation believes its valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different estimate of fair value at the reporting date.

During 2018, there were no changes to valuation approaches or techniques that had, or are expected to have, a material impact on the Corporation's consolidated financial position or results of operations.

Trading Account Assets and Liabilities and Debt Securities

The fair values of trading account assets and liabilities are primarily based on actively traded markets where prices are based on either direct market quotes or observed transactions. The fair values of debt securities are generally based on quoted market prices or market prices for similar assets. Liquidity is a significant factor in the determination of the fair values of trading account assets and liabilities and debt securities. Market price quotes may not be readily available for some positions such as positions within a market sector where trading activity has slowed significantly or ceased. Some of these instruments are valued using a discounted cash flow model, which estimates the fair value of the securities using internal credit risk, interest rate and prepayment risk models that incorporate management's best estimate of current key assumptions such as default rates, loss severity and prepayment rates. Principal and interest cash flows are discounted using an observable discount rate for similar instruments with adjustments that management believes a market participant would consider in determining fair value for the specific security. Other instruments are valued using a net asset value approach which considers the value of the underlying securities. Underlying assets are valued using external pricing services, where available, or matrix pricing based on the vintages and ratings. Situations of illiquidity generally are triggered by the market's perception of credit uncertainty regarding a single company or a specific market sector. In these instances, fair value is determined based on limited available market information and other factors, principally from reviewing the issuer's financial statements and changes in credit ratings made by one or more rating agencies.

Derivative Assets and Liabilities

The fair values of derivative assets and liabilities traded in the OTC market are determined using quantitative models that utilize multiple market inputs including interest rates, prices and indices to generate continuous yield or pricing curves and volatility factors to value the position. The majority of market inputs are actively quoted and can be validated through external sources, including brokers, market transactions and third-party pricing services. When third-party pricing services are used, the methods and assumptions are reviewed by the Corporation. Estimation risk is greater for derivative asset and liability positions that are either option-based or have longer maturity dates where observable market inputs are less readily available, or are unobservable, in which case, quantitative-based extrapolations of rate, price or index scenarios are used in determining fair values. The fair values of derivative assets and liabilities include adjustments for market liquidity, counterparty credit quality and other instrument-specific factors, where appropriate. In addition, the Corporation incorporates within its fair value measurements of OTC derivatives a valuation adjustment to reflect the credit risk associated with the net position. Positions are netted by counterparty, and fair value for net long exposures is adjusted for counterparty credit risk while the fair value for net short exposures is adjusted for the Corporation's own credit risk. The Corporation also incorporates FVA within its fair value measurements to include funding costs on uncollateralized derivatives and derivatives where the Corporation is not permitted to use the collateral it receives. An estimate of severity of loss is also used in the determination of fair value, primarily based on market data.

Loans and Loan Commitments

The fair values of loans and loan commitments are based on market prices, where available, or discounted cash flow analyses using market-based credit spreads of comparable debt instruments or credit derivatives of the specific borrower or comparable borrowers. Results of discounted cash flow analyses may be adjusted, as appropriate, to reflect other market conditions or the perceived credit risk of the borrower.

Mortgage Servicing Rights

The fair values of MSRs are primarily determined using an option-adjusted spread (OAS) valuation approach, which factors in prepayment risk to determine the fair value of MSRs. This approach consists of projecting servicing cash flows under multiple interest rate scenarios and discounting these cash flows using risk-adjusted discount rates.

Loans Held-for-sale

The fair values of LHFS are based on quoted market prices, where available, or are determined by discounting estimated cash flows using interest rates approximating the Corporation's current origination rates for similar loans adjusted to reflect the inherent credit risk. The borrower-specific credit risk is embedded within the quoted market prices or is implied by considering loan performance when selecting comparables.

Short-term Borrowings and Long-term Debt

The Corporation issues structured liabilities that have coupons or repayment terms linked to the performance of debt or equity securities, indices, currencies or commodities. The fair values of these structured liabilities are estimated using quantitative models for the combined derivative and debt portions of the notes. These models incorporate observable and, in some instances, unobservable inputs including security prices, interest rate yield curves, option volatility, currency, commodity or equity rates and correlations among these inputs. The Corporation also considers the impact of its own credit spread in determining the discount rate used to value these liabilities. The credit spread is determined by reference to observable spreads in the secondary bond market.

Securities Financing Agreements

The fair values of certain reverse repurchase agreements, repurchase agreements and securities borrowed transactions are determined using quantitative models, including discounted cash flow models that require the use of multiple market inputs including interest rates and spreads to generate continuous yield or pricing curves, and volatility factors. The majority of market inputs are actively quoted and can be validated through external sources, including brokers, market transactions and third-party pricing services.

Deposits

The fair values of deposits are determined using quantitative models, including discounted cash flow models that require the use of multiple market inputs including interest rates and spreads to generate continuous yield or pricing curves, and volatility factors. The majority of market inputs are actively quoted and can be validated through external sources, including brokers, market transactions and third-party pricing services. The Corporation considers the impact of its own credit spread in the valuation of these liabilities. The credit risk is determined by reference to observable credit spreads in the secondary cash market.

Asset-backed Secured Financings

The fair values of asset-backed secured financings are based on external broker bids, where available, or are determined by discounting estimated cash flows using interest rates approximating the Corporation's current origination rates for similar loans adjusted to reflect the inherent credit risk.

Recurring Fair Value

Assets and liabilities carried at fair value on a recurring basis at December 31, 2018 and 2017, including financial instruments which the Corporation accounts for under the fair value option, are summarized in the following tables.

(Dollars in millions)	December 31, 2018				
	Fair Value Measurements				
	Level 1	Level 2	Level 3	Netting Adjustments [(1)]	Assets/Liabilities at Fair Value
Assets					
Time deposits placed and other short-term investments	$ 1,214	$ —	$ —	$ —	$ 1,214
Federal funds sold and securities borrowed or purchased under agreements to resell	—	56,399	—	—	56,399
Trading account assets:					
U.S. Treasury and agency securities [(2)]	53,131	1,593	—	—	54,724
Corporate securities, trading loans and other	—	24,630	1,558	—	26,188
Equity securities	53,840	23,163	276	—	77,279
Non-U.S. sovereign debt	5,818	19,210	465	—	25,493
Mortgage trading loans, MBS and ABS:					
U.S. government-sponsored agency guaranteed	—	19,586	—	—	19,586
Mortgage trading loans, ABS and other MBS	—	9,443	1,635	—	11,078
Total trading account assets [(3)]	112,789	97,625	3,934	—	214,348
Derivative assets	9,967	315,413	3,466	(285,121)	43,725
AFS debt securities:					
U.S. Treasury and agency securities	53,663	1,260	—	—	54,923
Mortgage-backed securities:					
Agency	—	121,826	—	—	121,826
Agency-collateralized mortgage obligations	—	5,530	—	—	5,530
Non-agency residential	—	1,320	597	—	1,917
Commercial	—	14,078	—	—	14,078
Non-U.S. securities	—	9,304	2	—	9,306
Other taxable securities	—	4,403	7	—	4,410
Tax-exempt securities	—	17,376	—	—	17,376
Total AFS debt securities	53,663	175,097	606	—	229,366
Other debt securities carried at fair value:					
U.S. Treasury and agency securities	1,282	—	—	—	1,282
Mortgage-backed securities:					
Non-agency residential	—	1,434	172	—	1,606
Non-U.S. securities	490	5,354	—	—	5,844
Other taxable securities	—	3	—	—	3
Total other debt securities carried at fair value	1,772	6,791	172	—	8,735
Loans and leases	—	4,011	338	—	4,349
Loans held-for-sale	—	2,400	542	—	2,942
Other assets [(4)]	15,032	1,775	2,932	—	19,739
Total assets [(5)]	$ 194,437	$ 659,511	$ 11,990	$ (285,121)	$ 580,817
Liabilities					
Interest-bearing deposits in U.S. offices	$ —	$ 492	$ —	$ —	$ 492
Federal funds purchased and securities loaned or sold under agreements to repurchase	—	28,875	—	—	28,875
Trading account liabilities:					
U.S. Treasury and agency securities	7,894	761	—	—	8,655
Equity securities	33,739	4,070	—	—	37,809
Non-U.S. sovereign debt	7,452	9,182	—	—	16,634
Corporate securities and other	—	5,104	18	—	5,122
Total trading account liabilities	49,085	19,117	18	—	68,220
Derivative liabilities	9,931	303,441	4,401	(279,882)	37,891
Short-term borrowings	—	1,648	—	—	1,648
Accrued expenses and other liabilities	18,096	1,979	—	—	20,075
Long-term debt	—	26,820	817	—	27,637
Total liabilities [(5)]	$ 77,112	$ 382,372	$ 5,236	$ (279,882)	$ 184,838

(1) Amounts represent the impact of legally enforceable master netting agreements and also cash collateral held or placed with the same counterparties.
(2) Includes $20.2 billion of GSE obligations.
(3) Includes securities with a fair value of $16.6 billion that were segregated in compliance with securities regulations or deposited with clearing organizations. This amount is included in the parenthetical disclosure on the Consolidated Balance Sheet.
(4) Includes MSRs of $2.0 billion which are classified as Level 3 assets.
(5) Total recurring Level 3 assets were 0.51 percent of total consolidated assets, and total recurring Level 3 liabilities were 0.25 percent of total consolidated liabilities.

(Dollars in millions)	December 31, 2017				
	Fair Value Measurements				
	Level 1	Level 2	Level 3	Netting Adjustments (1)	Assets/Liabilities at Fair Value
Assets					
Time deposits placed and other short-term investments	$ 2,234	$ —	$ —	$ —	$ 2,234
Federal funds sold and securities borrowed or purchased under agreements to resell	—	52,906	—	—	52,906
Trading account assets:					
U.S. Treasury and agency securities (2)	38,720	1,922	—	—	40,642
Corporate securities, trading loans and other	—	28,714	1,864	—	30,578
Equity securities	60,747	23,958	235	—	84,940
Non-U.S. sovereign debt	6,545	15,839	556	—	22,940
Mortgage trading loans, MBS and ABS:					
U.S. government-sponsored agency guaranteed	—	20,586	—	—	20,586
Mortgage trading loans, ABS and other MBS	—	8,174	1,498	—	9,672
Total trading account assets (3)	106,012	99,193	4,153	—	209,358
Derivative assets	6,305	341,178	4,067	(313,788)	37,762
AFS debt securities:					
U.S. Treasury and agency securities	51,915	1,608	—	—	53,523
Mortgage-backed securities:					
Agency	—	192,929	—	—	192,929
Agency-collateralized mortgage obligations	—	6,804	—	—	6,804
Non-agency residential	—	2,669	—	—	2,669
Commercial	—	13,684	—	—	13,684
Non-U.S. securities	772	5,880	25	—	6,677
Other taxable securities	—	5,261	509	—	5,770
Tax-exempt securities	—	20,106	469	—	20,575
Total AFS debt securities	52,687	248,941	1,003	—	302,631
Other debt securities carried at fair value:					
Mortgage-backed securities:					
Non-agency residential	—	2,769	—	—	2,769
Non-U.S. securities	8,191	1,297	—	—	9,488
Other taxable securities	—	229	—	—	229
Total other debt securities carried at fair value	8,191	4,295	—	—	12,486
Loans and leases	—	5,139	571	—	5,710
Loans held-for-sale	—	1,466	690	—	2,156
Other assets (4)	19,367	789	2,425	—	22,581
Total assets (5)	$ 194,796	$ 753,907	$ 12,909	$ (313,788)	$ 647,824
Liabilities					
Interest-bearing deposits in U.S. offices	$ —	$ 449	$ —	$ —	$ 449
Federal funds purchased and securities loaned or sold under agreements to repurchase	—	36,182	—	—	36,182
Trading account liabilities:					
U.S. Treasury and agency securities	17,266	734	—	—	18,000
Equity securities	33,019	3,885	—	—	36,904
Non-U.S. sovereign debt	11,976	7,382	—	—	19,358
Corporate securities and other	—	6,901	24	—	6,925
Total trading account liabilities	62,261	18,902	24	—	81,187
Derivative liabilities	6,029	334,261	5,781	(311,771)	34,300
Short-term borrowings	—	1,494	—	—	1,494
Accrued expenses and other liabilities	21,887	945	8	—	22,840
Long-term debt	—	29,923	1,863	—	31,786
Total liabilities (5)	$ 90,177	$ 422,156	$ 7,676	$ (311,771)	$ 208,238

(1) Amounts represent the impact of legally enforceable master netting agreements and also cash collateral held or placed with the same counterparties.
(2) Includes $21.3 billion of GSE obligations.
(3) Includes securities with a fair value of $16.8 billion that were segregated in compliance with securities regulations or deposited with clearing organizations. This amount is included in the parenthetical disclosure on the Consolidated Balance Sheet.
(4) Includes MSRs of $2.3 billion which are classified as Level 3 assets.
(5) Total recurring Level 3 assets were 0.57 percent of total consolidated assets, and total recurring Level 3 liabilities were 0.38 percent of total consolidated liabilities.

The following tables present a reconciliation of all assets and liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) during 2018, 2017 and 2016, including net realized and unrealized gains (losses) included in earnings and accumulated OCI.

Level 3 – Fair Value Measurements in 2018 (1)

(Dollars in millions)	Balance January 1 2018	Total Realized/ Unrealized Gains (Losses) in Net Income (2)	Gains (Losses) in OCI (3)	Gross				Gross Transfers into Level 3	Gross Transfers out of Level 3	Balance December 31 2018	Change in Unrealized Gains (Losses) in Net Income Related to Financial Instruments Still Held (2)
				Purchases	Sales	Issuances	Settlements				
Trading account assets:											
Corporate securities, trading loans and other	$ 1,864	$ (32)	$ (1)	$ 436	$ (403)	$ 5	$ (568)	$ 804	$ (547)	$ 1,558	$ (117)
Equity securities	235	(17)	—	44	(11)	—	(4)	78	(49)	276	(22)
Non-U.S. sovereign debt	556	47	(44)	13	(57)	—	(30)	117	(137)	465	48
Mortgage trading loans, ABS and other MBS	1,498	148	3	585	(910)	—	(158)	705	(236)	1,635	97
Total trading account assets	4,153	146	(42)	1,078	(1,381)	5	(760)	1,704	(969)	3,934	6
Net derivative assets (4)	(1,714)	106	—	531	(1,179)	—	778	39	504	(935)	(116)
AFS debt securities:											
Non-agency residential MBS	—	27	(33)	—	(71)	—	(25)	774	(75)	597	—
Non-U.S. securities	25	—	(1)	—	(10)	—	(15)	3	—	2	—
Other taxable securities	509	1	(3)	—	(23)	—	(11)	60	(526)	7	—
Tax-exempt securities	469	—	—	—	—	—	(1)	1	(469)	—	—
Total AFS debt securities (5)	1,003	28	(37)	—	(104)	—	(52)	838	(1,070)	606	—
Other debt securities carried at fair value – Non-agency residential MBS	—	(18)	—	—	(8)	—	(34)	365	(133)	172	(18)
Loans and leases (6, 7)	571	(16)	—	—	(134)	—	(83)	—	—	338	(9)
Loans held-for-sale (6)	690	44	(26)	71	—	1	(201)	23	(60)	542	31
Other assets (5, 7, 8)	2,425	414	(38)	2	(69)	96	(792)	929	(35)	2,932	149
Trading account liabilities – Corporate securities and other	(24)	11	—	9	(12)	(2)	—	—	—	(18)	(7)
Accrued expenses and other liabilities (6)	(8)	—	—	—	—	—	8	—	—	—	—
Long-term debt (6)	(1,863)	103	4	9	—	(141)	486	(262)	847	(817)	95

(1) Assets (liabilities). For assets, increase (decrease) to Level 3 and for liabilities, (increase) decrease to Level 3.

(2) Includes gains (losses) reported in earnings in the following income statement line items: Trading account assets/liabilities - predominantly trading account profits; Net derivative assets - primarily trading account profits and other income; Other debt securities carried at fair value - other income; Loans and leases - other income; Loans held-for-sale - other income; Other assets - primarily other income related to MSRs; Long-term debt - primarily trading account profits. For MSRs, the amounts reflect the changes in modeled MSR fair value due to observed changes in interest rates, volatility, spreads and the shape of the forward swap curve, and periodic adjustments to the valuation model to reflect changes in the modeled relationships between inputs and projected cash flows, as well as changes in cash flow assumptions including cost to service.

(3) Includes unrealized gains (losses) in OCI on AFS debt securities, foreign currency translation adjustments and the impact of changes in the Corporation's credit spreads on long-term debt accounted for under the fair value option. Total gains (losses) in OCI include net unrealized losses of $105 million related to financial instruments still held at December 31, 2018. For additional information, see *Note 1 – Summary of Significant Accounting Principles.*

(4) Net derivative assets include derivative assets of $3.5 billion and derivative liabilities of $4.4 billion.

(5) Transfers out of AFS debt securities and into other assets primarily relate to the reclassification of certain securities.

(6) Amounts represent instruments that are accounted for under the fair value option.

(7) Issuances represent loan originations and MSRs recognized following securitizations or whole-loan sales.

(8) Settlements primarily represent the net change in fair value of the MSR asset due to the recognition of modeled cash flows and the passage of time.

Transfers into Level 3, primarily due to decreased price observability, during 2018 included $1.7 billion of trading account assets, $838 million of AFS debt securities, $365 million of other debt securities carried at fair value and $262 million of long-term debt. Transfers occur on a regular basis for long-term debt instruments due to changes in the impact of unobservable inputs on the value of the embedded derivative in relation to the instrument as a whole.

Transfers out of Level 3, primarily due to increased price observability, during 2018 included $969 million of trading account assets, $504 million of net derivatives assets, $1.1 billion of AFS debt securities and $847 million of long-term debt.

Level 3 – Fair Value Measurements in 2017 [(1)]

(Dollars in millions)	Balance January 1 2017	Total Realized/ Unrealized Gains (Losses) in Net Income [(2)]	Gains (Losses) in OCI [(3)]	Gross				Gross Transfers into Level 3	Gross Transfers out of Level 3	Balance December 31 2017	Change in Unrealized Gains (Losses) in Net Income Related to Financial Instruments Still Held [(2)]
				Purchases	Sales	Issuances	Settlements				
Trading account assets:											
Corporate securities, trading loans and other	$ 2,777	$ 229	$ —	$ 547	$ (702)	$ 5	$ (666)	$ 728	$(1,054)	$ 1,864	$ 2
Equity securities	281	18	—	55	(70)	—	(10)	146	(185)	235	(1)
Non-U.S. sovereign debt	510	74	(8)	53	(59)	—	(73)	72	(13)	556	70
Mortgage trading loans, ABS and other MBS	1,211	165	(2)	1,210	(990)	—	(233)	218	(81)	1,498	72
Total trading account assets	4,779	486	(10)	1,865	(1,821)	5	(982)	1,164	(1,333)	4,153	143
Net derivative assets [(4)]	(1,313)	(984)	—	664	(979)	—	949	48	(99)	(1,714)	(409)
AFS debt securities:											
Non-U.S. securities	229	2	16	49	—	—	(271)	—	—	25	—
Other taxable securities	594	4	8	5	—	—	(42)	34	(94)	509	—
Tax-exempt securities	542	1	3	14	(70)	—	(11)	35	(45)	469	—
Total AFS debt securities	1,365	7	27	68	(70)	—	(324)	69	(139)	1,003	—
Other debt securities carried at fair value – Non-agency residential MBS	25	(1)	—	—	(21)	—	(3)	—	—	—	—
Loans and leases [(5)]	720	15	—	3	(34)	—	(126)	—	(7)	571	11
Loans held-for-sale [(5, 6)]	656	100	(3)	3	(189)	—	(346)	501	(32)	690	14
Other assets [(6, 7)]	2,986	144	(57)	2	(214)	258	(758)	64	—	2,425	(226)
Federal funds purchased and securities loaned or sold under agreements to repurchase [(5)]	(359)	(5)	—	—	—	(12)	171	(58)	263	—	—
Trading account liabilities – Corporate securities and other	(27)	14	—	8	(17)	(2)	—	—	—	(24)	2
Accrued expenses and other liabilities [(5)]	(9)	—	—	—	—	—	1	—	—	(8)	—
Long-term debt [(5)]	(1,514)	(135)	(31)	84	—	(288)	514	(711)	218	(1,863)	(196)

(1) Assets (liabilities). For assets, increase (decrease) to Level 3 and for liabilities, (increase) decrease to Level 3.

(2) Includes gains (losses) reported in earnings in the following income statement line items: Trading account assets/liabilities - predominantly trading account profits; Net derivative assets - primarily trading account profits and other income; Other debt securities carried at fair value - other income; Loans and leases - other income; Loans held-for-sale - other income; Other assets - primarily other income related to MSRs; Long-term debt - trading account profits. For MSRs, the amounts reflect the changes in modeled MSR fair value due to observed changes in interest rates, volatility, spreads and the shape of the forward swap curve, and periodic adjustments to the valuation model to reflect changes in the modeled relationships between inputs and projected cash flows, as well as changes in cash flow assumptions including cost to service.

(3) Includes unrealized gains (losses) in OCI on AFS debt securities, foreign currency translation adjustments and the impact of changes in the Corporation's credit spreads on long-term debt accounted for under the fair value option. For additional information, see *Note 1 – Summary of Significant Accounting Principles*.

(4) Net derivative assets include derivative assets of $4.1 billion and derivative liabilities of $5.8 billion.

(5) Amounts represent instruments that are accounted for under the fair value option.

(6) Issuances represent loan originations and MSRs recognized following securitizations or whole-loan sales.

(7) Settlements primarily represent the net change in fair value of the MSR asset due to the recognition of modeled cash flows and the passage of time.

Transfers into Level 3, primarily due to decreased price observability, during 2017 included $1.2 billion of trading account assets, $501 million of LHFS and $711 million of long-term debt. Transfers occur on a regular basis for long-term debt instruments due to changes in the impact of unobservable inputs on the value of the embedded derivative in relation to the instrument as a whole.

Transfers out of Level 3, primarily due to increased price observability, during 2017 included $1.3 billion of trading account assets, $139 million of AFS debt securities, $263 million of federal funds purchased and securities loaned or sold under agreements to repurchase and $218 million of long-term debt.

Level 3 – Fair Value Measurements in 2016 (1)

(Dollars in millions)	Balance January 1 2016	Total Realized/ Unrealized Gains/ (Losses) in Net Income (2)	Gains/ (Losses) in OCI (3)	Gross Purchases	Gross Sales	Gross Issuances	Gross Settlements	Gross Transfers into Level 3	Gross Transfers out of Level 3	Balance December 31 2016	Change in Unrealized Gains/ (Losses) in Net Income Related to Financial Instruments Still Held (2)
Trading account assets:											
Corporate securities, trading loans and other	$ 2,838	$ 78	$ 2	$ 1,508	$ (847)	$ —	$ (725)	$ 728	$ (805)	$ 2,777	$ (82)
Equity securities	407	74	—	73	(169)	—	(82)	70	(92)	281	(59)
Non-U.S. sovereign debt	521	122	91	12	(146)	—	(90)	—	—	510	120
Mortgage trading loans, ABS and other MBS	1,868	188	(2)	988	(1,491)	—	(344)	158	(154)	1,211	64
Total trading account assets	5,634	462	91	2,581	(2,653)	—	(1,241)	956	(1,051)	4,779	43
Net derivative assets (4)	(441)	285	—	470	(1,155)	—	76	(186)	(362)	(1,313)	(376)
AFS debt securities:											
Non-agency residential MBS	106	—	—	—	(106)	—	—	—	—	—	—
Non-U.S. securities	—	—	(6)	584	(92)	—	(263)	6	—	229	—
Other taxable securities	757	4	(2)	—	—	—	(83)	—	(82)	594	—
Tax-exempt securities	569	—	(1)	1	—	—	(2)	10	(35)	542	—
Total AFS debt securities	1,432	4	(9)	585	(198)	—	(348)	16	(117)	1,365	—
Other debt securities carried at fair value – Non-agency residential MBS	30	(5)	—	—	—	—	—	—	—	25	—
Loans and leases (5, 6)	1,620	(44)	—	69	(553)	50	(194)	6	(234)	720	17
Loans held-for-sale (5)	787	79	50	22	(256)	—	(93)	173	(106)	656	70
Other assets (6, 7)	3,461	136	—	38	(191)	411	(872)	3	—	2,986	(143)
Federal funds purchased and securities loaned or sold under agreements to repurchase (5)	(335)	(11)	—	—	—	(22)	27	(19)	1	(359)	4
Trading account liabilities – Corporate securities and other	(21)	5	—	—	(11)	—	—	—	—	(27)	4
Short-term borrowings (5)	(30)	1	—	—	—	—	29	—	—	—	—
Accrued expenses and other liabilities (5)	(9)	—	—	—	—	—	—	—	—	(9)	—
Long-term debt (5)	(1,513)	(74)	(20)	140	—	(521)	948	(939)	465	(1,514)	(184)

(1) Assets (liabilities). For assets, increase (decrease) to Level 3 and for liabilities, (increase) decrease to Level 3.
(2) Includes gains/losses reported in earnings in the following income statement line items: Trading account assets/liabilities - trading account profits; Net derivative assets - primarily trading account profits and other income; Other debt securities carried at fair value - other income; Loans and leases - other income; Loans held-for-sale - other income; Other assets - primarily other income related to MSRs; Long-term debt - predominantly trading account profits. For MSRs, the amounts reflect the changes in modeled MSR fair value due to observed changes in interest rates, volatility, spreads and the shape of the forward swap curve, and periodic adjustments to the valuation model to reflect changes in the modeled relationships between inputs and projected cash flows, as well as changes in cash flow assumptions including cost to service.
(3) Includes unrealized gains/losses in OCI on AFS debt securities, foreign currency translation adjustments and the impact of changes in the Corporation's credit spreads on long-term debt accounted for under the fair value option. For more information, see *Note 1 – Summary of Significant Accounting Principles*.
(4) Net derivatives include derivative assets of $3.9 billion and derivative liabilities of $5.2 billion.
(5) Amounts represent instruments that are accounted for under the fair value option.
(6) Issuances represent loan originations and MSRs recognized following securitizations or whole-loan sales.
(7) Settlements represent the net change in fair value of the MSR asset due to the recognition of modeled cash flows and the passage of time.

Transfers into Level 3, primarily due to decreased price observability, during 2016 included $956 million of trading account assets, $186 million of net derivative assets, $173 million of LHFS and $939 million of long-term debt. Transfers occur on a regular basis for long-term debt instruments due to changes in the impact of unobservable inputs on the value of the embedded derivative in relation to the instrument as a whole.

Transfers out of Level 3, primarily due to increased price observability, during 2016 included $1.1 billion of trading account assets, $362 million of net derivative assets, $117 million of AFS debt securities, $234 million of loans and leases, $106 million of LHFS and $465 million of long-term debt.

The following tables present information about significant unobservable inputs related to the Corporation's material categories of Level 3 financial assets and liabilities at December 31, 2018 and 2017.

Quantitative Information about Level 3 Fair Value Measurements at December 31, 2018

(Dollars in millions)

Financial Instrument	Fair Value	Valuation Technique	Inputs: Significant Unobservable Inputs	Inputs: Ranges of Inputs	Inputs: Weighted Average [1]
Loans and Securities [2]					
Instruments backed by residential real estate assets	**$ 1,536**	Discounted cash flow, Market comparables	Yield	0% to 25%	8%
Trading account assets – Mortgage trading loans, ABS and other MBS	419		Prepayment speed	0% to 21% CPR	12%
Loans and leases	338		Default rate	0% to 3% CDR	1%
Loans held-for-sale	1		Loss severity	0% to 51%	17%
AFS debt securities, primarily non-agency residential	606		Price	$0 to $128	$72
Other debt securities carried at fair value - Non-agency residential	172				
Instruments backed by commercial real estate assets	**$ 291**	Discounted cash flow	Yield	0% to 25%	7%
Trading account assets – Corporate securities, trading loans and other	200		Price	$0 to $100	$79
Trading account assets – Mortgage trading loans, ABS and other MBS	91				
Commercial loans, debt securities and other	**$ 3,489**	Discounted cash flow, Market comparables	Yield	1% to 18%	13%
Trading account assets – Corporate securities, trading loans and other	1,358		Prepayment speed	10% to 20%	15%
Trading account assets – Non-U.S. sovereign debt	465		Default rate	3% to 4%	4%
Trading account assets – Mortgage trading loans, ABS and other MBS	1,125		Loss severity	35% to 40%	38%
Loans held-for-sale	541		Price	$0 to $141	$68
Other assets, primarily auction rate securities	**$ 890**	Discounted cash flow, Market comparables	Price	$10 to $100	$95
MSRs	**$ 2,042**	Discounted cash flow	Weighted-average life, fixed rate [5]	0 to 14 years	5 years
			Weighted-average life, variable rate [5]	0 to 10 years	3 years
			Option-adjusted spread, fixed rate	7% to 14%	9%
			Option-adjusted spread, variable rate	9% to 15%	12%
Structured liabilities					
Long-term debt	**$ (817)**	Discounted cash flow, Market comparables, Industry standard derivative pricing [3]	Equity correlation	11% to 100%	67%
			Long-dated equity volatilities	4% to 84%	32%
			Yield	7% to 18%	16%
			Price	$0 to $100	$72
Net derivative assets					
Credit derivatives	**$ (565)**	Discounted cash flow, Stochastic recovery correlation model	Yield	0% to 5%	4%
			Upfront points	0 points to 100 points	70 points
			Credit correlation	70%	n/a
			Prepayment speed	15% to 20% CPR	15%
			Default rate	1% to 4% CDR	2%
			Loss severity	35%	n/a
			Price	$0 to $138	$93
Equity derivatives	**$ (348)**	Industry standard derivative pricing [3]	Equity correlation	11% to 100%	67%
			Long-dated equity volatilities	4% to 84%	32%
Commodity derivatives	**$ 10**	Discounted cash flow, Industry standard derivative pricing [3]	Natural gas forward price	$1/MMBtu to $12/MMBtu	$3/MMBtu
			Correlation	38% to 87%	71%
			Volatilities	15% to 132%	38%
Interest rate derivatives	**$ (32)**	Industry standard derivative pricing [4]	Correlation (IR/IR)	15% to 70%	61%
			Correlation (FX/IR)	0% to 46%	1%
			Long-dated inflation rates	-20% to 38%	2%
			Long-dated inflation volatilities	0% to 1%	1%
Total net derivative assets	**$ (935)**				

(1) For loans and securities, structured liabilities and net derivative assets, the weighted average is calculated based upon the absolute fair value of the instruments.
(2) The categories are aggregated based upon product type which differs from financial statement classification. The following is a reconciliation to the line items in the table on page 167: Trading account assets – Corporate securities, trading loans and other of $1.6 billion, Trading account assets – Non-U.S. sovereign debt of $465 million, Trading account assets – Mortgage trading loans, ABS and other MBS of $1.6 billion, AFS debt securities of $606 million, Other debt securities carried at fair value - Non-agency residential of $172 million, Other assets, including MSRs, of $2.9 billion, Loans and leases of $338 million and LHFS of $542 million.
(3) Includes models such as Monte Carlo simulation and Black-Scholes.
(4) Includes models such as Monte Carlo simulation, Black-Scholes and other methods that model the joint dynamics of interest, inflation and foreign exchange rates.
(5) The weighted-average life is a product of changes in market rates of interest, prepayment rates and other model and cash flow assumptions.

CPR = Constant Prepayment Rate
CDR = Constant Default Rate
MMBtu = Million British thermal units
IR = Interest Rate
FX = Foreign Exchange
n/a = not applicable

Quantitative Information about Level 3 Fair Value Measurements at December 31, 2017

(Dollars in millions)

Financial Instrument	Fair Value	Valuation Technique	Significant Unobservable Inputs	Ranges of Inputs	Weighted Average [1]
Loans and Securities [2]					
Instruments backed by residential real estate assets	$ 871	Discounted cash flow	Yield	0% to 25%	6%
Trading account assets – Mortgage trading loans, ABS and other MBS	298		Prepayment speed	0% to 22% CPR	12%
Loans and leases	570		Default rate	0% to 3% CDR	1%
Loans held-for-sale	3		Loss severity	0% to 53%	17%
Instruments backed by commercial real estate assets	$ 286	Discounted cash flow	Yield	0% to 25%	9%
Trading account assets – Corporate securities, trading loans and other	244		Price	$0 to $100	$67
Trading account assets – Mortgage trading loans, ABS and other MBS	42				
Commercial loans, debt securities and other	$ 4,023	Discounted cash flow, Market comparables	Yield	0% to 12%	5%
Trading account assets – Corporate securities, trading loans and other	1,613		Prepayment speed	10% to 20%	16%
Trading account assets – Non-U.S. sovereign debt	556		Default rate	3% to 4%	4%
Trading account assets – Mortgage trading loans, ABS and other MBS	1,158		Loss severity	35% to 40%	37%
AFS debt securities – Other taxable securities	8		Price	$0 to $145	$63
Loans and leases	1				
Loans held-for-sale	687				
Auction rate securities	$ 977	Discounted cash flow, Market comparables	Price	$10 to $100	$94
Trading account assets – Corporate securities, trading loans and other	7				
AFS debt securities – Other taxable securities	501				
AFS debt securities – Tax-exempt securities	469				
MSRs	$ 2,302	Discounted cash flow	Weighted-average life, fixed rate [5]	0 to 14 years	5 years
			Weighted-average life, variable rate [5]	0 to 10 years	3 years
			Option-adjusted spread, fixed rate	9% to 14%	10%
			Option-adjusted spread, variable rate	9% to 15%	12%
Structured liabilities					
Long-term debt	$ (1,863)	Discounted cash flow, Market comparables, Industry standard derivative pricing [3]	Equity correlation	15% to 100%	63%
			Long-dated equity volatilities	4% to 84%	22%
			Yield	7.5%	n/a
			Price	$0 to $100	$66
Net derivative assets					
Credit derivatives	$ (282)	Discounted cash flow, Stochastic recovery correlation model	Yield	1% to 5%	3%
			Upfront points	0 points to 100 points	71 points
			Credit correlation	35% to 83%	42%
			Prepayment speed	15% to 20% CPR	16%
			Default rate	1% to 4% CDR	2%
			Loss severity	35%	n/a
			Price	$0 to $102	$82
Equity derivatives	$ (2,059)	Industry standard derivative pricing [3]	Equity correlation	15% to 100%	63%
			Long-dated equity volatilities	4% to 84%	22%
Commodity derivatives	$ (3)	Discounted cash flow, Industry standard derivative pricing [3]	Natural gas forward price	$1/MMBtu to $5/MMBtu	$3/MMBtu
			Correlation	71% to 87%	81%
			Volatilities	26% to 132%	57%
Interest rate derivatives	$ 630	Industry standard derivative pricing [4]	Correlation (IR/IR)	15% to 92%	50%
			Correlation (FX/IR)	0% to 46%	1%
			Long-dated inflation rates	-14% to 38%	4%
			Long-dated inflation volatilities	0% to 1%	1%
Total net derivative assets	$ (1,714)				

(1) For loans and securities, structured liabilities and net derivative assets, the weighted average is calculated based upon the absolute fair value of the instruments.
(2) The categories are aggregated based upon product type which differs from financial statement classification. The following is a reconciliation to the line items in the table on page 168: Trading account assets – Corporate securities, trading loans and other of $1.9 billion, Trading account assets – Non-U.S. sovereign debt of $556 million, Trading account assets – Mortgage trading loans, ABS and other MBS of $1.5 billion, AFS debt securities – Other taxable securities of $509 million, AFS debt securities – Tax-exempt securities of $469 million, Loans and leases of $571 million and LHFS of $690 million.
(3) Includes models such as Monte Carlo simulation and Black-Scholes.
(4) Includes models such as Monte Carlo simulation, Black-Scholes and other methods that model the joint dynamics of interest, inflation and foreign exchange rates.
(5) The weighted-average life is a product of changes in market rates of interest, prepayment rates and other model and cash flow assumptions.
CPR = Constant Prepayment Rate
CDR = Constant Default Rate
MMBtu = Million British thermal units
IR = Interest Rate
FX = Foreign Exchange
n/a = not applicable

In the previous tables, instruments backed by residential and commercial real estate assets include RMBS, commercial MBS, whole loans and mortgage CDOs. Commercial loans, debt securities and other include corporate CLOs and CDOs, commercial loans and bonds, and securities backed by non-real estate assets. Structured liabilities primarily include equity-linked notes that are accounted for under the fair value option.

The Corporation uses multiple market approaches in valuing certain of its Level 3 financial instruments. For example, market comparables and discounted cash flows are used together. For a given product, such as corporate debt securities, market comparables may be used to estimate some of the unobservable inputs and then these inputs are incorporated into a discounted cash flow model. Therefore, the balances disclosed encompass both of these techniques.

The level of aggregation and diversity within the products disclosed in the tables results in certain ranges of inputs being wide and unevenly distributed across asset and liability categories.

Uncertainty of Fair Value Measurements from Unobservable Inputs

Loans and Securities

A significant increase in market yields, default rates, loss severities or duration would have resulted in a significantly lower fair value for long positions. Short positions would have been impacted in a directionally opposite way. The impact of changes in prepayment speeds would have resulted in differing impacts depending on the seniority of the instrument and, in the case of CLOs, whether prepayments can be reinvested. A significant increase in price would have resulted in a significantly higher fair value for long positions, and short positions would have been impacted in a directionally opposite way.

Structured Liabilities and Derivatives

For credit derivatives, a significant increase in market yield, upfront points (i.e., a single upfront payment made by a protection buyer at inception), credit spreads, default rates or loss severities would have resulted in a significantly lower fair value for protection sellers and higher fair value for protection buyers. The impact of changes in prepayment speeds would have resulted in differing impacts depending on the seniority of the instrument.

Structured credit derivatives are impacted by credit correlation. Default correlation is a parameter that describes the degree of dependence among credit default rates within a credit portfolio that underlies a credit derivative instrument. The sensitivity of this input on the fair value varies depending on the level of subordination of the tranche. For senior tranches that are net purchases of protection, a significant increase in default correlation would have resulted in a significantly higher fair value. Net short protection positions would have been impacted in a directionally opposite way.

For equity derivatives, commodity derivatives, interest rate derivatives and structured liabilities, a significant change in long-dated rates and volatilities and correlation inputs (i.e., the degree of correlation between an equity security and an index, between two different commodities, between two different interest rates, or between interest rates and foreign exchange rates) would have resulted in a significant impact to the fair value; however, the magnitude and direction of the impact depend on whether the Corporation is long or short the exposure. For structured liabilities, a significant increase in yield or decrease in price would have resulted in a significantly lower fair value. A significant decrease in duration would have resulted in a significantly higher fair value.

Sensitivity of Fair Value Measurements for Mortgage Servicing Rights

The weighted-average lives and fair value of MSRs are sensitive to changes in modeled assumptions. The weighted-average life is a product of changes in market rates of interest, prepayment rates and other model and cash flow assumptions. The weighted-average life represents the average period of time that the MSRs' cash flows are expected to be received. Absent other changes, an increase (decrease) to the weighted-average life would generally result in an increase (decrease) in the fair value of the MSRs. For example, a 10 percent or 20 percent decrease in prepayment rates, which impacts the weighted-average life, could result in an increase in fair value of $64 million or $133 million, while a 10 percent or 20 percent increase in prepayment rates could result in a decrease in fair value of $59 million or $115 million. A 100 bp or 200 bp decrease in OAS levels could result in an increase in fair value of $63 million or $131 million, while a 100 bp or 200 bp increase in OAS levels could result in a decrease in fair value of $59 million or $115 million. These sensitivities are hypothetical and actual amounts may vary materially.

Nonrecurring Fair Value

The Corporation holds certain assets that are measured at fair value, but only in certain situations (e.g., impairment) and these measurements are referred to herein as nonrecurring. The amounts below represent assets still held as of the reporting date for which a nonrecurring fair value adjustment was recorded during 2018, 2017 and 2016.

Assets Measured at Fair Value on a Nonrecurring Basis

	December 31, 2018		December 31, 2017	
(Dollars in millions)	Level 2	Level 3	Level 2	Level 3
Assets				
Loans held-for-sale	$ 274	$ —	$ —	$ 2
Loans and leases [(1)]	—	474	—	894
Foreclosed properties [(2, 3)]	—	42	—	83
Other assets	331	14	425	—

	Gains (Losses)		
	2018	2017	2016
Assets			
Loans held-for-sale	$ (18)	$ (6)	$ (54)
Loans and leases [(1)]	(202)	(336)	(458)
Foreclosed properties	(24)	(41)	(41)
Other assets	(64)	(124)	(74)

(1) Includes $83 million, $135 million and $150 million of losses on loans that were written down to a collateral value of zero during 2018, 2017 and 2016, respectively.
(2) Amounts are included in other assets on the Consolidated Balance Sheet and represent the carrying value of foreclosed properties that were written down subsequent to their initial classification as foreclosed properties. Losses on foreclosed properties include losses recorded during the first 90 days after transfer of a loan to foreclosed properties.
(3) Excludes $488 million and $801 million of properties acquired upon foreclosure of certain government-guaranteed loans (principally FHA-insured loans) at December 31, 2018 and 2017.

The table below presents information about significant unobservable inputs related to the Corporation's nonrecurring Level 3 financial assets and liabilities at December 31, 2018 and 2017. Loans and leases backed by residential real estate assets represent residential mortgages where the loan has been written down to the fair value of the underlying collateral.

Quantitative Information about Nonrecurring Level 3 Fair Value Measurements

Financial Instrument	Fair Value	Valuation Technique	Inputs: Significant Unobservable Inputs	Inputs: Ranges of Inputs	Inputs: Weighted Average [(1)]
(Dollars in millions)			December 31, 2018		
Loans and leases backed by residential real estate assets	$ 474	Market comparables	OREO discount	13% to 59%	25%
			Costs to sell	8% to 26%	9%
			December 31, 2017		
Loans and leases backed by residential real estate assets	$ 894	Market comparables	OREO discount	15% to 58%	23%
			Costs to sell	5% to 49%	7%

(1) The weighted average is calculated based upon the fair value of the loans.

NOTE 21 Fair Value Option

Loans and Loan Commitments

The Corporation elects to account for certain loans and loan commitments that exceed the Corporation's single-name credit risk concentration guidelines under the fair value option. Lending commitments are actively managed and, as appropriate, credit risk for these lending relationships may be mitigated through the use of credit derivatives, with the Corporation's public side credit view and market perspectives determining the size and timing of the hedging activity. These credit derivatives do not meet the requirements for designation as accounting hedges and therefore are carried at fair value with changes in fair value recorded in other income. The fair value option allows the Corporation to carry these loans and loan commitments at fair value, which is more consistent with management's view of the underlying economics and the manner in which they are managed. In addition, the fair value option allows the Corporation to reduce the accounting volatility that would otherwise result from the asymmetry created by accounting for the financial instruments at historical cost and the credit derivatives at fair value.

Loans Held-for-sale

The Corporation elects to account for residential mortgage LHFS, commercial mortgage LHFS and certain other LHFS under the fair value option with interest income on these LHFS recorded in other interest income. These loans are actively managed and monitored and, as appropriate, certain market risks of the loans may be mitigated through the use of derivatives. The Corporation has elected not to designate the derivatives as qualifying accounting hedges and therefore they are carried at fair value with changes in fair value recorded in other income. The changes in fair value of the loans are largely offset by changes in the fair value of the derivatives. The fair value option allows the Corporation to reduce the accounting volatility that would otherwise result from the asymmetry created by accounting for the financial instruments at the lower of cost or fair value and the derivatives at fair value. The Corporation has not elected to account for certain other LHFS under the fair value option primarily because these loans are floating-rate loans that are not hedged using derivative instruments.

Loans Reported as Trading Account Assets

The Corporation elects to account for certain loans that are held for the purpose of trading and are risk-managed on a fair value basis under the fair value option.

Other Assets

The Corporation elects to account for certain long-term fixed-rate margin loans that are hedged with derivatives under the fair value option. Election of the fair value option allows the Corporation to reduce the accounting volatility that would otherwise result from the asymmetry created by accounting for the financial instruments at historical cost and the derivatives at fair value.

Securities Financing Agreements

The Corporation elects to account for certain securities financing agreements, including resale and repurchase agreements, under the fair value option based on the tenor of the agreements, which reflects the magnitude of the interest rate risk. The majority of securities financing agreements collateralized by U.S. government securities are not accounted for under the fair value option as these contracts are generally short-dated and therefore the interest rate risk is not significant.

Long-term Deposits

The Corporation elects to account for certain long-term fixed-rate and rate-linked deposits that are hedged with derivatives that do not qualify for hedge accounting under the fair value option. Election of the fair value option allows the Corporation to reduce the accounting volatility that would otherwise result from the asymmetry created by accounting for the financial instruments at historical cost and the derivatives at fair value. The Corporation has not elected to carry other long-term deposits at fair value because they are not hedged using derivatives.

Short-term Borrowings

The Corporation elects to account for certain short-term borrowings, primarily short-term structured liabilities, under the fair value option because this debt is risk-managed on a fair value basis.

The Corporation elects to account for certain asset-backed secured financings, which are also classified in short-term borrowings, under the fair value option. Election of the fair value option allows the Corporation to reduce the accounting volatility that would otherwise result from the asymmetry created by accounting for the asset-backed secured financings at historical cost and the corresponding mortgage LHFS securing these financings at fair value.

Long-term Debt

The Corporation elects to account for certain long-term debt, primarily structured liabilities, under the fair value option. This long-term debt is either risk-managed on a fair value basis or the related hedges do not qualify for hedge accounting.

Fair Value Option Elections

The table below provides information about the fair value carrying amount and the contractual principal outstanding of assets and liabilities accounted for under the fair value option at December 31, 2018 and 2017.

Fair Value Option Elections

(Dollars in millions)	December 31, 2018 Fair Value Carrying Amount	December 31, 2018 Contractual Principal Outstanding	December 31, 2018 Fair Value Carrying Amount Less Unpaid Principal	December 31, 2017 Fair Value Carrying Amount	December 31, 2017 Contractual Principal Outstanding	December 31, 2017 Fair Value Carrying Amount Less Unpaid Principal
Federal funds sold and securities borrowed or purchased under agreements to resell	$ 56,399	$ 56,376	$ 23	$ 52,906	$ 52,907	$ (1)
Loans reported as trading account assets [1]	6,195	13,088	(6,893)	5,735	11,804	(6,069)
Trading inventory – other	13,778	n/a	n/a	12,027	n/a	n/a
Consumer and commercial loans	4,349	4,399	(50)	5,710	5,744	(34)
Loans held-for-sale [1]	2,942	4,749	(1,807)	2,156	3,717	(1,561)
Other assets	3	n/a	n/a	3	n/a	n/a
Long-term deposits	492	454	38	449	421	28
Federal funds purchased and securities loaned or sold under agreements to repurchase	28,875	28,881	(6)	36,182	36,187	(5)
Short-term borrowings	1,648	1,648	—	1,494	1,494	—
Unfunded loan commitments	169	n/a	n/a	120	n/a	n/a
Long-term debt [2]	27,637	29,147	(1,510)	31,786	31,512	274

(1) A significant portion of the loans reported as trading account assets and LHFS are distressed loans that were purchased at a deep discount to par, and the remainder are loans with a fair value near contractual principal outstanding.

(2) Includes structured liabilities with a fair value of $27.3 billion and $31.4 billion, and contractual principal outstanding of $28.8 billion and $31.1 billion at December 31, 2018 and 2017.

n/a = not applicable

The following tables provide information about where changes in the fair value of assets and liabilities accounted for under the fair value option are included in the Consolidated Statement of Income for 2018, 2017 and 2016.

Gains (Losses) Relating to Assets and Liabilities Accounted for Under the Fair Value Option

(Dollars in millions)	Trading Account Profits	Other Income	Total
		2018	
Loans reported as trading account assets (1)	**$ 8**	**$ —**	**$ 8**
Trading inventory – other (2)	**1,750**	**—**	**1,750**
Consumer and commercial loans (1)	**(422)**	**(53)**	**(475)**
Loans held-for-sale (1, 3)	**1**	**24**	**25**
Unfunded loan commitments	**—**	**(49)**	**(49)**
Long-term debt (4, 5)	**2,157**	**(93)**	**2,064**
Other (6)	**8**	**18**	**26**
Total	**$ 3,502**	**$ (153)**	**$ 3,349**
		2017	
Loans reported as trading account assets (1)	$ 318	$ —	$ 318
Trading inventory – other (2)	3,821	—	3,821
Consumer and commercial loans (1)	(9)	35	26
Loans held-for-sale (1, 3)	—	298	298
Unfunded loan commitments	—	36	36
Long-term debt (4, 5)	(1,044)	(146)	(1,190)
Other (6)	(93)	13	(80)
Total	$ 2,993	$ 236	$ 3,229
		2016	
Loans reported as trading account assets (1)	$ 301	$ —	$ 301
Trading inventory – other (2)	57	—	57
Consumer and commercial loans (1)	49	(37)	12
Loans held-for-sale (1, 3)	11	524	535
Unfunded loan commitments	—	487	487
Long-term debt (4, 5)	(489)	(97)	(586)
Other (6)	(85)	53	(32)
Total	$ (156)	$ 930	$ 774

(1) Gains (losses) related to borrower-specific credit risk were not significant.
(2) The gains in trading account profits are primarily offset by losses on trading liabilities that hedge these assets.
(3) Includes the value of IRLCs on funded loans, including those sold during the period.
(4) The majority of the net gains (losses) in trading account profits relate to the embedded derivatives in structured liabilities and are offset by gains (losses) on derivatives and securities that hedge these liabilities.
(5) For the cumulative impact of changes in the Corporation's own credit spreads and the amount recognized in accumulated OCI, see *Note 14 – Accumulated Other Comprehensive Income (Loss)*. For more information on how the Corporation's own credit spread is determined, see *Note 20 – Fair Value Measurements*.
(6) Includes gains (losses) on federal funds sold and securities borrowed or purchased under agreements to resell, other assets, long-term deposits, federal funds purchased and securities loaned or sold under agreements to repurchase and short-term borrowings.

NOTE 22 Fair Value of Financial Instruments

Financial instruments are classified within the fair value hierarchy using the methodologies described in *Note 20 – Fair Value Measurements*. Certain loans, deposits, long-term debt and unfunded lending commitments are accounted for under the fair value option. For additional information, see *Note 21 – Fair Value Option*. The following disclosures include financial instruments that are not carried at fair value or only a portion of the ending balance is carried at fair value on the Consolidated Balance Sheet.

Short-term Financial Instruments

The carrying value of short-term financial instruments, including cash and cash equivalents, certain time deposits placed and other short-term investments, federal funds sold and purchased, certain resale and repurchase agreements and short-term borrowings, approximates the fair value of these instruments. These financial instruments generally expose the Corporation to limited credit risk and have no stated maturities or have short-term maturities and carry interest rates that approximate market. The Corporation accounts for certain resale and repurchase agreements under the fair value option.

Under the fair value hierarchy, cash and cash equivalents are classified as Level 1. Time deposits placed and other short-term investments, such as U.S. government securities and short-term commercial paper, are classified as Level 1 or Level 2. Federal funds sold and purchased are classified as Level 2. Resale and repurchase agreements are classified as Level 2 because they are generally short-dated and/or variable-rate instruments collateralized by U.S. government or agency securities. Short-term borrowings are classified as Level 2.

Fair Value of Financial Instruments

The carrying values and fair values by fair value hierarchy of certain financial instruments where only a portion of the ending balance was carried at fair value at December 31, 2018 and 2017 are presented in the following table.

Fair Value of Financial Instruments

	Carrying Value	Fair Value		
		Level 2	Level 3	Total
(Dollars in millions)	December 31, 2018			
Financial assets				
Loans	$ 911,520	$ 58,228	$ 859,160	$ 917,388
Loans held-for-sale	10,367	9,592	775	10,367
Financial liabilities				
Deposits (1)	1,381,476	1,381,239	—	1,381,239
Long-term debt	229,340	229,967	817	230,784
Commercial unfunded lending commitments (2)	966	169	5,558	5,727
	December 31, 2017			
Financial assets				
Loans	$ 904,399	$ 68,586	$ 849,576	$ 918,162
Loans held-for-sale	11,430	10,521	909	11,430
Financial liabilities				
Deposits (1)	1,309,545	1,309,398	—	1,309,398
Long-term debt	227,402	235,126	1,863	236,989
Commercial unfunded lending commitments (2)	897	120	3,908	4,028

(1) Includes demand deposits of $531.9 billion and $519.6 billion with no stated maturities at December 31, 2018 and 2017.

(2) The carrying value of commercial unfunded lending commitments is included in accrued expenses and other liabilities on the Consolidated Balance Sheet. The Corporation does not estimate the fair value of consumer unfunded lending commitments because, in many instances, the Corporation can reduce or cancel these commitments by providing notice to the borrower. For more information on commitments, see *Note 12 – Commitments and Contingencies*.

NOTE 23 Business Segment Information

The Corporation reports its results of operations through the following four business segments: *Consumer Banking*, *GWIM*, *Global Banking* and *Global Markets*, with the remaining operations recorded in *All Other*.

Consumer Banking

Consumer Banking offers a diversified range of credit, banking and investment products and services to consumers and small businesses. *Consumer Banking* product offerings include traditional savings accounts, money market savings accounts, CDs and IRAs, checking accounts, and investment accounts and products, as well as credit and debit cards, residential mortgages and home equity loans, and direct and indirect loans to consumers and small businesses in the U.S. *Consumer Banking* includes the impact of servicing residential mortgages and home equity loans in the core portfolio.

Global Wealth & Investment Management

GWIM provides a high-touch client experience through a network of financial advisors focused on clients with over $250,000 in total investable assets, including tailored solutions to meet clients' needs through a full set of investment management, brokerage, banking and retirement products. *GWIM* also provides comprehensive wealth management solutions targeted to high net worth and ultra high net worth clients, as well as customized solutions to meet clients' wealth structuring, investment management, trust and banking needs, including specialty asset management services.

Global Banking

Global Banking provides a wide range of lending-related products and services, integrated working capital management and treasury solutions, and underwriting and advisory services through the Corporation's network of offices and client relationship teams. *Global Banking* also provides investment banking products to clients. The economics of certain investment banking and underwriting activities are shared primarily between *Global Banking* and *Global Markets* under an internal revenue-sharing arrangement. *Global Banking* clients generally include middle-market companies, commercial real estate firms, not-for-profit companies, large global corporations, financial institutions, leasing clients, and mid-sized U.S.-based businesses requiring customized and integrated financial advice and solutions.

Global Markets

Global Markets offers sales and trading services and research services to institutional clients across fixed-income, credit, currency, commodity and equity businesses. *Global Markets* provides market-making, financing, securities clearing, settlement and custody services globally to institutional investor clients in support of their investing and trading activities. *Global Markets* product coverage includes securities and derivative products in both the primary and secondary markets. *Global Markets* also works with commercial and corporate clients to provide risk management products. As a result of market-making activities, *Global Markets* may be required to manage risk in a broad range of financial products. In addition, the economics of certain investment banking and underwriting activities are shared primarily between *Global Markets* and *Global Banking* under an internal revenue-sharing arrangement.

All Other

All Other consists of ALM activities, equity investments, non-core mortgage loans and servicing activities, the net impact of periodic revisions to the MSR valuation model for core and non-core MSRs and the related economic hedge results, liquidating businesses and residual expense allocations. ALM activities encompass certain residential mortgages, debt securities, interest rate and foreign currency risk management activities, the impact of certain allocation methodologies and hedge ineffectiveness. The results of certain ALM activities are allocated to the business segments. Equity investments include the merchant services joint venture as well as a portfolio of equity, real estate and other alternative investments.

Basis of Presentation

The management accounting and reporting process derives segment and business results by utilizing allocation methodologies for revenue and expense. The net income derived for the businesses is dependent upon revenue and cost allocations using an activity-based costing model, funds transfer pricing, and other methodologies and assumptions management believes are appropriate to reflect the results of the business.

Total revenue, net of interest expense, includes net interest income on an FTE basis and noninterest income. The adjustment of net interest income to an FTE basis results in a corresponding increase in income tax expense. The segment results also reflect certain revenue and expense methodologies that are utilized to determine net income. The net interest income of the businesses includes the results of a funds transfer pricing process that matches assets and liabilities with similar interest rate sensitivity and maturity characteristics. In segments where the total of liabilities and equity exceeds assets, which are generally deposit-taking segments, the Corporation allocates assets to match liabilities. Net interest income of the business segments also includes an allocation of net interest income generated by certain of the Corporation's ALM activities.

The Corporation's ALM activities include an overall interest rate risk management strategy that incorporates the use of various derivatives and cash instruments to manage fluctuations in earnings and capital that are caused by interest rate volatility. The Corporation's goal is to manage interest rate sensitivity so that movements in interest rates do not significantly adversely affect earnings and capital. The results of a majority of the Corporation's ALM activities are allocated to the business segments and fluctuate based on the performance of the ALM activities. ALM activities include external product pricing decisions including deposit pricing strategies, the effects of the Corporation's internal funds transfer pricing process and the net effects of other ALM activities.

Certain expenses not directly attributable to a specific business segment are allocated to the segments. The costs of certain centralized or shared functions are allocated based on methodologies that reflect utilization.

The following table presents net income (loss) and the components thereto (with net interest income on an FTE basis for the business segments, *All Other* and the total Corporation) for 2018, 2017 and 2016, and total assets at December 31, 2018 and 2017 for each business segment, as well as *All Other.*

Results of Business Segments and All Other

At and for the year ended December 31	**Total Corporation [1]**			**Consumer Banking**		
(Dollars in millions)	**2018**	2017	2016	**2018**	2017	2016
Net interest income	**$ 48,042**	$ 45,592	$ 41,996	**$ 27,123**	$ 24,307	$ 21,290
Noninterest income	**43,815**	42,685	42,605	**10,400**	10,214	10,441
Total revenue, net of interest expense	**91,857**	88,277	84,601	**37,523**	34,521	31,731
Provision for credit losses	**3,282**	3,396	3,597	**3,664**	3,525	2,715
Noninterest expense	**53,381**	54,743	55,083	**17,713**	17,795	17,664
Income before income taxes	**35,194**	30,138	25,921	**16,146**	13,201	11,352
Income tax expense	**7,047**	11,906	8,099	**4,117**	4,999	4,186
Net income	**$ 28,147**	$ 18,232	$ 17,822	**$ 12,029**	$ 8,202	$ 7,166
Year-end total assets	**$ 2,354,507**	$ 2,281,234		**$ 768,877**	$ 749,325	

	Global Wealth & Investment Management			**Global Banking**		
	2018	2017	2016	**2018**	2017	2016
Net interest income	**$ 6,294**	$ 6,173	$ 5,759	**$ 10,881**	$ 10,504	$ 9,471
Noninterest income	**13,044**	12,417	11,891	**8,763**	9,495	8,974
Total revenue, net of interest expense	**19,338**	18,590	17,650	**19,644**	19,999	18,445
Provision for credit losses	**86**	56	68	**8**	212	883
Noninterest expense	**13,777**	13,556	13,166	**8,591**	8,596	8,486
Income before income taxes	**5,475**	4,978	4,416	**11,045**	11,191	9,076
Income tax expense	**1,396**	1,885	1,635	**2,872**	4,238	3,347
Net income	**$ 4,079**	$ 3,093	$ 2,781	**$ 8,173**	$ 6,953	$ 5,729
Year-end total assets	**$ 305,906**	$ 284,321		**$ 441,477**	$ 424,533	

	Global Markets			**All Other**		
	2018	2017	2016	**2018**	2017	2016
Net interest income	**$ 3,171**	$ 3,744	$ 4,557	**$ 573**	$ 864	$ 919
Noninterest income	**12,892**	12,207	11,533	**(1,284)**	(1,648)	(234)
Total revenue, net of interest expense	**16,063**	15,951	16,090	**(711)**	(784)	685
Provision for credit losses	**—**	164	31	**(476)**	(561)	(100)
Noninterest expense	**10,686**	10,731	10,171	**2,614**	4,065	5,596
Income (loss) before income taxes	**5,377**	5,056	5,888	**(2,849)**	(4,288)	(4,811)
Income tax expense (benefit)	**1,398**	1,763	2,071	**(2,736)**	(979)	(3,140)
Net income (loss)	**$ 3,979**	$ 3,293	$ 3,817	**$ (113)**	$ (3,309)	$ (1,671)
Year-end total assets	**$ 641,922**	$ 629,013		**$ 196,325**	$ 194,042	

(1) There were no material intersegment revenues.

The table below presents noninterest income and the components thereto for 2018, 2017 and 2016 for each business segment, as well as *All Other*. For more information, see *Note 1 – Summary of Significant Accounting Principles* and *Note 2 – Noninterest Income*.

Noninterest Income by Business Segment and All Other

	Total Corporation			Consumer Banking			Global Wealth & Investment Management		
(Dollars in millions)	**2018**	2017	2016	**2018**	2017	2016	**2018**	2017	2016
Card income									
Interchange fees	**$ 4,093**	$ 3,942	$ 3,960	**$ 3,383**	$ 3,224	$ 3,271	**$ 82**	$ 109	$ 106
Other card income	**1,958**	1,960	1,891	**1,906**	1,846	1,664	**46**	44	44
Total card income	**6,051**	5,902	5,851	**5,289**	5,070	4,935	**128**	153	150
Service charges									
Deposit-related fees	**6,667**	6,708	6,545	**4,300**	4,266	4,142	**73**	76	74
Lending-related fees	**1,100**	1,110	1,093	**—**	—	—	**—**	—	—
Total service charges	**7,767**	7,818	7,638	**4,300**	4,266	4,142	**73**	76	74
Investment and brokerage services									
Asset management fees	**10,189**	9,310	8,328	**147**	133	120	**10,042**	9,177	8,208
Brokerage fees	**3,971**	4,526	5,021	**172**	184	200	**1,917**	2,217	2,666
Total investment and brokerage services	**14,160**	13,836	13,349	**319**	317	320	**11,959**	11,394	10,874
Investment banking income									
Underwriting income	**2,722**	2,821	2,585	**(1)**	—	2	**335**	316	225
Syndication fees	**1,347**	1,499	1,388	**—**	—	—	**—**	—	1
Financial advisory services	**1,258**	1,691	1,268	**—**	—	—	**2**	2	1
Total investment banking income	**5,327**	6,011	5,241	**(1)**	—	2	**337**	318	227
Trading account profits	**8,540**	7,277	6,902	**8**	3	—	**112**	144	175
Other income	**1,970**	1,841	3,624	**485**	558	1,042	**435**	332	391
Total noninterest income	**$ 43,815**	$ 42,685	$ 42,605	**$ 10,400**	$ 10,214	$ 10,441	**$ 13,044**	$ 12,417	$ 11,891

	Global Banking			Global Markets			All Other [1]		
	2018	2017	2016	**2018**	2017	2016	**2018**	2017	2016
Card income									
Interchange fees	**$ 533**	$ 506	$ 483	**$ 95**	$ 94	$ 79	**$ —**	$ 9	$ 21
Other card income	**8**	12	20	**(2)**	(2)	(5)	**—**	60	168
Total card income	**541**	518	503	**93**	92	74	**—**	69	189
Service charges									
Deposit-related fees	**2,111**	2,197	2,170	**161**	147	143	**22**	22	16
Lending-related fees	**916**	928	924	**184**	182	169	**—**	—	—
Total service charges	**3,027**	3,125	3,094	**345**	329	312	**22**	22	16
Investment and brokerage services									
Asset management fees	**—**	—	—	**—**	—	—	**—**	—	—
Brokerage fees	**94**	97	74	**1,780**	2,049	2,102	**8**	(21)	(21)
Total investment and brokerage services	**94**	97	74	**1,780**	2,049	2,102	**8**	(21)	(21)
Investment banking income									
Underwriting income	**502**	511	426	**2,084**	2,249	2,100	**(198)**	(255)	(168)
Syndication fees	**1,237**	1,403	1,302	**109**	95	85	**1**	1	—
Financial advisory services	**1,152**	1,557	1,156	**103**	132	111	**1**	—	—
Total investment banking income	**2,891**	3,471	2,884	**2,296**	2,476	2,296	**(196)**	(254)	(168)
Trading account profits	**260**	134	133	**7,932**	6,710	6,550	**228**	286	44
Other income	**1,950**	2,150	2,286	**446**	551	199	**(1,346)**	(1,750)	(294)
Total noninterest income	**$ 8,763**	$ 9,495	$ 8,974	**$ 12,892**	$ 12,207	$ 11,533	**$ (1,284)**	$ (1,648)	$ (234)

[1] *All Other* includes eliminations of intercompany transactions.

The tables below present a reconciliation of the four business segments' total revenue, net of interest expense, on an FTE basis, and net income to the Consolidated Statement of Income, and total assets to the Consolidated Balance Sheet.

(Dollars in millions)	**2018**	2017	2016
Segments' total revenue, net of interest expense	**$ 92,568**	$ 89,061	$ 83,916
Adjustments [1]:			
ALM activities	**588**	312	(299)
Liquidating businesses, eliminations and other	**(1,299)**	(1,096)	984
FTE basis adjustment	**(610)**	(925)	(900)
Consolidated revenue, net of interest expense	**$ 91,247**	$ 87,352	$ 83,701
Segments' total net income	**28,260**	21,541	19,493
Adjustments, net-of-tax [1]:			
ALM activities	**(46)**	(355)	(651)
Liquidating businesses, eliminations and other	**(67)**	(2,954)	(1,020)
Consolidated net income	**$ 28,147**	$ 18,232	$ 17,822

[1] Adjustments include consolidated income, expense and asset amounts not specifically allocated to individual business segments.

(Dollars in millions)	December 31 2018	December 31 2017
Segments' total assets	$ 2,158,182	$ 2,087,192
Adjustments [(1)]:		
ALM activities, including securities portfolio	670,057	625,483
Elimination of segment asset allocations to match liabilities	(540,801)	(520,448)
Other	67,069	89,007
Consolidated total assets	$ 2,354,507	$ 2,281,234

(1) Adjustments include consolidated income, expense and asset amounts not specifically allocated to individual business segments.

NOTE 24 Parent Company Information

The following tables present the Parent Company-only financial information. This financial information is presented in accordance with bank regulatory reporting requirements.

Condensed Statement of Income

(Dollars in millions)	2018	2017	2016
Income			
Dividends from subsidiaries:			
Bank holding companies and related subsidiaries	$ 28,575	$ 12,088	$ 4,127
Nonbank companies and related subsidiaries	91	202	77
Interest from subsidiaries	8,425	7,043	2,996
Other income (loss)	(1,025)	28	111
Total income	36,066	19,361	7,311
Expense			
Interest on borrowed funds from related subsidiaries	235	189	969
Other interest expense	6,425	5,555	5,096
Noninterest expense	1,600	1,672	2,704
Total expense	8,260	7,416	8,769
Income (loss) before income taxes and equity in undistributed earnings of subsidiaries	27,806	11,945	(1,458)
Income tax expense (benefit)	(281)	950	(2,311)
Income before equity in undistributed earnings of subsidiaries	28,087	10,995	853
Equity in undistributed earnings (losses) of subsidiaries:			
Bank holding companies and related subsidiaries	306	8,725	16,817
Nonbank companies and related subsidiaries	(246)	(1,488)	152
Total equity in undistributed earnings of subsidiaries	60	7,237	16,969
Net income	$ 28,147	$ 18,232	$ 17,822

Condensed Balance Sheet

(Dollars in millions)	December 31 2018	December 31 2017
Assets		
Cash held at bank subsidiaries [(1)]	$ 5,141	$ 4,747
Securities	628	596
Receivables from subsidiaries:		
Bank holding companies and related subsidiaries	152,905	146,566
Banks and related subsidiaries	195	146
Nonbank companies and related subsidiaries	969	4,745
Investments in subsidiaries:		
Bank holding companies and related subsidiaries	293,045	296,506
Nonbank companies and related subsidiaries	3,432	5,225
Other assets	14,696	14,554
Total assets	$ 471,011	$ 473,085
Liabilities and shareholders' equity		
Accrued expenses and other liabilities	$ 8,828	$ 10,286
Payables to subsidiaries:		
Banks and related subsidiaries	349	359
Nonbank companies and related subsidiaries	13,301	9,341
Long-term debt	183,208	185,953
Total liabilities	205,686	205,939
Shareholders' equity	265,325	267,146
Total liabilities and shareholders' equity	$ 471,011	$ 473,085

(1) Balance includes third-party cash held of $389 million and $193 million at December 31, 2018 and 2017.

Condensed Statement of Cash Flows

(Dollars in millions)	2018	2017	2016
Operating activities			
Net income	**$ 28,147**	$ 18,232	$ 17,822
Reconciliation of net income to net cash used in operating activities:			
Equity in undistributed earnings of subsidiaries	**(60)**	(7,237)	(16,969)
Other operating activities, net	**(3,706)**	(2,593)	(2,860)
Net cash provided by (used in) operating activities	**24,381**	8,402	(2,007)
Investing activities			
Net sales of securities	**51**	312	—
Net payments to subsidiaries	**(2,262)**	(7,087)	(65,481)
Other investing activities, net	**48**	(1)	(308)
Net cash used in investing activities	**(2,163)**	(6,776)	(65,789)
Financing activities			
Net decrease in short-term borrowings	**—**	—	(136)
Net increase (decrease) in other advances	**3,867**	(6,672)	(44)
Proceeds from issuance of long-term debt	**30,708**	37,704	27,363
Retirement of long-term debt	**(29,413)**	(29,645)	(30,804)
Proceeds from issuance of preferred stock	**4,515**	—	2,947
Redemption of preferred stock	**(4,512)**	—	—
Common stock repurchased	**(20,094)**	(12,814)	(5,112)
Cash dividends paid	**(6,895)**	(5,700)	(4,194)
Net cash used in financing activities	**(21,824)**	(17,127)	(9,980)
Net increase (decrease) in cash held at bank subsidiaries	**394**	(15,501)	(77,776)
Cash held at bank subsidiaries at January 1	**4,747**	20,248	98,024
Cash held at bank subsidiaries at December 31	**$ 5,141**	$ 4,747	$ 20,248

NOTE 25 Performance by Geographical Area

The Corporation's operations are highly integrated with operations in both U.S. and non-U.S. markets. The non-U.S. business activities are largely conducted in Europe, the Middle East and Africa and in Asia. The Corporation identifies its geographic performance based on the business unit structure used to manage the capital or expense deployed in the region as applicable. This requires certain judgments related to the allocation of revenue so that revenue can be appropriately matched with the related capital or expense deployed in the region. Certain asset, liability, income and expense amounts have been allocated to arrive at total assets, total revenue, net of interest expense, income before income taxes and net income by geographic area as presented below.

(Dollars in millions)		Total Assets at Year End (1)	Total Revenue, Net of Interest Expense (2)	Income Before Income Taxes	Net Income
U.S. (3)	**2018**	**$ 2,051,182**	**$ 81,004**	**$ 31,904**	**$ 26,407**
	2017	1,965,490	74,830	25,108	15,550
	2016		72,418	22,282	16,183
Asia	**2018**	**94,865**	**3,507**	**865**	**520**
	2017	103,255	3,405	676	464
	2016		3,365	674	488
Europe, Middle East and Africa	**2018**	**185,285**	**5,632**	**1,543**	**1,126**
	2017	189,661	7,907	2,990	1,926
	2016		6,608	1,705	925
Latin America and the Caribbean	**2018**	**23,175**	**1,104**	**272**	**94**
	2017	22,828	1,210	439	292
	2016		1,310	360	226
Total Non-U.S.	**2018**	**303,325**	**10,243**	**2,680**	**1,740**
	2017	315,744	12,522	4,105	2,682
	2016		11,283	2,739	1,639
Total Consolidated	**2018**	**$ 2,354,507**	**$ 91,247**	**$ 34,584**	**$ 28,147**
	2017	2,281,234	87,352	29,213	18,232
	2016		83,701	25,021	17,822

(1) Total assets include long-lived assets, which are primarily located in the U.S.
(2) There were no material intercompany revenues between geographic regions for any of the periods presented.
(3) Substantially reflects the U.S.

Glossary

Alt-A Mortgage – A type of U.S. mortgage that is considered riskier than A-paper, or "prime," and less risky than "subprime," the riskiest category. Typically, Alt-A mortgages are characterized by borrowers with less than full documentation, lower credit scores and higher LTVs.

Assets Under Management (AUM) – The total market value of assets under the investment advisory and/or discretion of *GWIM* which generate asset management fees based on a percentage of the assets' market values. AUM reflects assets that are generally managed for institutional, high net worth and retail clients, and are distributed through various investment products including mutual funds, other commingled vehicles and separate accounts.

Banking Book – All on- and off-balance sheet financial instruments of the Corporation except for those positions that are held for trading purposes.

Brokerage and Other Assets – Non-discretionary client assets which are held in brokerage accounts or held for safekeeping.

Committed Credit Exposure – Any funded portion of a facility plus the unfunded portion of a facility on which the lender is legally bound to advance funds during a specified period under prescribed conditions.

Credit Derivatives – Contractual agreements that provide protection against a specified credit event on one or more referenced obligations.

Credit Valuation Adjustment (CVA) – A portfolio adjustment required to properly reflect the counterparty credit risk exposure as part of the fair value of derivative instruments.

Debit Valuation Adjustment (DVA) – A portfolio adjustment required to properly reflect the Corporation's own credit risk exposure as part of the fair value of derivative instruments and/or structured liabilities.

Funding Valuation Adjustment (FVA) – A portfolio adjustment required to include funding costs on uncollateralized derivatives and derivatives where the Corporation is not permitted to use the collateral it receives.

Interest Rate Lock Commitment (IRLC) – Commitment with a loan applicant in which the loan terms are guaranteed for a designated period of time subject to credit approval.

Letter of Credit – A document issued on behalf of a customer to a third party promising to pay the third party upon presentation of specified documents. A letter of credit effectively substitutes the issuer's credit for that of the customer.

Loan-to-value (LTV) – A commonly used credit quality metric. LTV is calculated as the outstanding carrying value of the loan divided by the estimated value of the property securing the loan.

Margin Receivable – An extension of credit secured by eligible securities in certain brokerage accounts.

Matched Book – Repurchase and resale agreements or securities borrowed and loaned transactions where the overall asset and liability position is similar in size and/or maturity. Generally, these are entered into to accommodate customers where the Corporation earns the interest rate spread.

Mortgage Servicing Rights (MSR) – The right to service a mortgage loan when the underlying loan is sold or securitized. Servicing includes collections for principal, interest and escrow payments from borrowers and accounting for and remitting principal and interest payments to investors.

Net Interest Yield – Net interest income divided by average total interest-earning assets.

Nonperforming Loans and Leases – Includes loans and leases that have been placed on nonaccrual status, including nonaccruing loans whose contractual terms have been restructured in a manner that grants a concession to a borrower experiencing financial difficulties.

Operating Margin – Income before income taxes divided by total revenue, net of interest expense.

Prompt Corrective Action (PCA) – A framework established by the U.S. banking regulators requiring banks to maintain certain levels of regulatory capital ratios, comprised of five categories of capitalization: "well capitalized," "adequately capitalized," "undercapitalized," "significantly undercapitalized" and "critically undercapitalized." Insured depository institutions that fail to meet certain of these capital levels are subject to increasingly strict limits on their activities, including their ability to make capital distributions, pay management compensation, grow assets and take other actions.

Subprime Loans – Although a standard industry definition for subprime loans (including subprime mortgage loans) does not exist, the Corporation defines subprime loans as specific product offerings for higher risk borrowers.

Troubled Debt Restructurings (TDRs) – Loans whose contractual terms have been restructured in a manner that grants a concession to a borrower experiencing financial difficulties. Certain consumer loans for which a binding offer to restructure has been extended are also classified as TDRs.

Value-at-Risk (VaR) – VaR is a model that simulates the value of a portfolio under a range of hypothetical scenarios in order to generate a distribution of potential gains and losses. VaR represents the loss the portfolio is expected to experience with a given confidence level based on historical data. A VaR model is an effective tool in estimating ranges of potential gains and losses on our trading portfolios.

Acronyms

ABS	Asset-backed securities
AFS	Available-for-sale
ALM	Asset and liability management
AUM	Assets under management
AVM	Automated valuation model
BANA	Bank of America, National Association
BHC	Bank holding company
bps	basis points
CCAR	Comprehensive Capital Analysis and Review
CDO	Collateralized debt obligation
CDS	Credit default swap
CET1	Common equity tier 1
CGA	Corporate General Auditor
CLO	Collateralized loan obligation
CLTV	Combined loan-to-value
CVA	Credit valuation adjustment
DVA	Debit valuation adjustment
EAD	Exposure at default
EPS	Earnings per common share
ERC	Enterprise Risk Committee
EU	European Union
FCA	Financial Conduct Authority
FDIC	Federal Deposit Insurance Corporation
FHA	Federal Housing Administration
FHLB	Federal Home Loan Bank
FHLMC	Freddie Mac
FICC	Fixed-income, currencies and commodities
FICO	Fair Isaac Corporation (credit score)
FLUs	Front line units
FNMA	Fannie Mae
FTE	Fully taxable-equivalent
FVA	Funding valuation adjustment
GAAP	Accounting principles generally accepted in the United States of America
GLS	Global Liquidity Sources
GM&CA	Global Marketing and Corporate Affairs
GNMA	Government National Mortgage Association
GSE	Government-sponsored enterprise
G-SIB	Global systemically important bank
GWIM	Global Wealth & Investment Management
HELOC	Home equity line of credit
HQLA	High Quality Liquid Assets
HTM	Held-to-maturity
ICAAP	Internal Capital Adequacy Assessment Process
IRM	Independent Risk Management
IRLC	Interest rate lock commitment
ISDA	International Swaps and Derivatives Association, Inc.
LCR	Liquidity Coverage Ratio
LGD	Loss given default
LHFS	Loans held-for-sale
LIBOR	London InterBank Offered Rate
LTV	Loan-to-value
MBS	Mortgage-backed securities
MD&A	Management's Discussion and Analysis of Financial Condition and Results of Operations
MLGWM	Merrill Lynch Global Wealth Management
MLI	Merrill Lynch International
MLPCC	Merrill Lynch Professional Clearing Corp
MLPF&S	Merrill Lynch, Pierce, Fenner & Smith Incorporated
MRC	Management Risk Committee
MSA	Metropolitan Statistical Area
MSR	Mortgage servicing right
NSFR	Net Stable Funding Ratio
OAS	Option-adjusted spread
OCC	Office of the Comptroller of the Currency
OCI	Other comprehensive income
OREO	Other real estate owned
OTC	Over-the-counter
OTTI	Other-than-temporary impairment
PCA	Prompt Corrective Action
PCI	Purchased credit-impaired
RMBS	Residential mortgage-backed securities
RSU	Restricted stock unit
SBLC	Standby letter of credit
SCCL	Single-counterparty credit limits
SEC	Securities and Exchange Commission
SLR	Supplementary leverage ratio
TDR	Troubled debt restructurings
TLAC	Total loss-absorbing capacity
VA	U.S. Department of Veterans Affairs
VaR	Value-at-Risk
VIE	Variable interest entity

Disclosure Controls and Procedures

Bank of America Corporation and Subsidiaries

As of the end of the period covered by this report and pursuant to Rule 13a-15 of the Securities Exchange Act of 1934, as amended (Exchange Act), Bank of America's management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness and design of our disclosure controls and procedures (as that term is defined in Rule 13a-15(e) of the Exchange Act). Based upon that evaluation, Bank of America's Chief Executive Officer and Chief Financial Officer concluded that Bank of America's disclosure controls and procedures were effective, as of the end of the period covered by this report.

Executive Management Team and Management Committee

Bank of America Corporation

Executive Management Team

Brian T. Moynihan*
Chairman of the Board and
Chief Executive Officer

Dean C. Athanasia*
President, Retail and Preferred
& Small Business Banking

Catherine P. Bessant*
Chief Operations and
Technology Officer

Sheri B. Bronstein*
Chief Human Resources Officer

Paul M. Donofrio*
Chief Financial Officer

Anne M. Finucane
Vice Chairman,
Bank of America

Geoffrey S. Greener*
Chief Risk Officer

Christine P. Katziff
Chief Audit Executive

Kathleen A. Knox*
President, U.S. Trust

David G. Leitch*
Global General Counsel

Thomas K. Montag*
Chief Operating Officer

Thong M. Nguyen*
Vice Chairman,
Bank of America

Andrew M. Sieg*
President, Merrill Lynch
Wealth Management

Andrea B. Smith*
Chief Administrative Officer

Bruce R. Thompson
Vice Chairman

Management Committee**

Michael C. Ankrom Jr.
Global Banking Chief Risk Officer
and Enterprise Credit Risk Executive

Keith T. Banks
Vice Chairman, Wealth
Management and Head
of Investment Solutions Group

Alexandre Bettamio
President, Latin America

Rudolf A. Bless
Chief Accounting Officer

D. Steve Boland
Head of Consumer Lending

Alastair M. Borthwick
Head of Global Commercial Banking

Candace E. Browning-Platt
Head of Global Research

James P. DeMare
Co-Head of Global Fixed Income,
Currencies & Commodities Trading

Fabrizio Gallo
Head of Global Equities

Matthew M. Koder
Head of Global Corporate
and Investment Banking

Aron D. Levine
Head of Consumer Banking
and Investments

Bernard A. Mensah
President of Europe, Middle East
and Asia and Co-Head of Global
Fixed Income, Currencies &
Commodities Trading

Sharon L. Miller
Head of Small Business

Andrei Magasiner
Treasurer

E. Lee McEntire
Investor Relations Executive

Lauren A. Mogensen
Global Compliance and
Operational Risk Executive

Tram V. Nguyen
Global Corporate Strategy
Executive and Head of Wealth
Management Banking Products

Lorna R. Sabbia
Head of Retirement and
Personal Wealth Solutions

Robert A. Schleusner
Head of Wholesale Credit

Thomas M. Scrivener
Global Real Estate and
Enterprise Initiative Executive

Jiro Seguchi
Co-President, Asia Pacific and
Head of Asia Pacific Corporate
and Investment Banking;
Country Executive, Japan

Jin Su
Co-President, Asia Pacific and
Co-Head of Asia Pacific
Fixed Income, Currencies & Commodities

David C. Tyrie
Head of Advanced Solutions
and Digital Banking

Anne Walker
CFO Chief Operating Officer
and Corporate Financial
Planning Executive

Ather Williams III
Head of Business Banking

Sanaz Zaimi
Head of Global
Fixed Income, Currencies & Commodities
Sales and Country Executive, France

* Executive Officer
** All members of the Executive Management Team are also members of the Management Committee

Board of Directors
Bank of America Corporation

Board of Directors

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Chairman of the Board and
Chief Executive Officer,
Bank of America Corporation

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Lead Independent Director,
Bank of America Corporation;
Former Chairman
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HCA Inc.

Sharon L. Allen
Former Chairman,
Deloitte LLP

Susan S. Bies
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Federal Reserve System

Frank P. Bramble, Sr.
Former Executive Vice Chairman,
MBNA Corporation

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Former Chairman and
Global Head of Private
Wealth Management,
Deutsche Bank AG

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Chief Executive Officer,
Carnival Corporation and
Carnival plc

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Former Chairman,
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Former Chairman, President,
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Eversource Energy

Lionel L. Nowell, III
Former Senior Vice President
and Treasurer, PepsiCo, Inc.

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Michael D. White
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Former Vice Chairman and
Senior Executive Vice President,
Canadian Imperial Bank of Commerce

R. David Yost
Former Chief Executive Officer,
AmerisourceBergen Corporation

Maria T. Zuber
Vice President for Research and
E.A. Griswold Professor of Geophysics,
Massachusetts Institute of Technology

*Executive Officer

Corporate Information

Bank of America Corporation

Headquarters

The principal executive offices of Bank of America Corporation (the Corporation) are located in the Bank of America Corporate Center, 100 North Tryon Street, Charlotte, NC 28255.

Stock Listing

The Corporation's common stock is listed on the New York Stock Exchange (NYSE) under the symbol BAC. The stock is typically listed as BankAm in newspapers. As of December 31, 2018, there were 171,372 registered holders of the Corporation's common stock.

Investor Relations

Analysts, portfolio managers and other investors seeking additional information about Bank of America stock should contact our Equity Investor Relations group at 1.704.386.5681 or i_r@bankofamerica.com. For additional information about Bank of America from a credit perspective, including debt and preferred securities, contact our Fixed Income Investor Relations group at 1.866.607.1234 or fixedincomeir@bankofamerica.com. Visit the Investor Relations area of the Bank of America website, http://investor.bankofamerica.com, for stock and dividend information, financial news releases, links to Bank of America SEC filings, electronic versions of our annual reports and other items of interest to the Corporation's shareholders.

Customers

For assistance with Bank of America products and services, call 1.800.432.1000, or visit the Bank of America website at www.bankofamerica.com. Additional toll-free numbers for specific products and services are listed on our website at www.bankofamerica.com/contact.

News Media

News media seeking information should visit our online newsroom at http://newsroom.bankofamerica.com for news releases, press kits and other items relating to the Corporation, including a complete list of the Corporation's media relations specialists grouped by business specialty or geography.

Annual Report on Form 10-K

The Corporation's 2018 Annual Report on Form 10-K is available at http://investor.bankofamerica.com. The Corporation also will provide a copy of the 2018 Annual Report on Form 10-K (without exhibits) upon written request addressed to:

Bank of America Corporation
Office of the Corporate Secretary
Hearst Tower, 214 North Tryon Street
NC1-027-20-05
Charlotte, NC 28255

Shareholder Inquiries

For inquiries concerning dividend checks, electronic deposit of dividends, dividend reinvestment, tax statements, electronic delivery, transferring ownership, address changes or lost or stolen stock certificates, contact Bank of America Shareholder Services at Computershare Trust Company, N.A., via the Internet at www.computershare.com/bac; call 1.800.642.9855; or write to P.O. Box 505005, Louisville, KY 40233. For general shareholder information, contact Bank of America Office of the Corporate Secretary at 1.800.521.3984. Shareholders outside of the United States and Canada may call 1.781.575.2621.

Electronic Delivery

As part of our ongoing commitment to reduce paper consumption, we offer electronic methods for customer communications and transactions. Customers can sign up to receive online statements through their Bank of America or Merrill Lynch account website. In 2012, we adopted the SEC's Notice and Access rule, which allows certain issuers to inform shareholders of the electronic availability of Proxy materials, including the Annual Report, which significantly reduced the number of printed copies we produce and mail to shareholders. Shareholders still receiving printed copies can join our efforts by electing to receive an electronic copy of the Annual Report and Proxy materials. If you have an account maintained in your name at Computershare Investor Services, you may sign up for this service at www.computershare.com/bac. If your shares are held by a broker, bank or other nominee, you may elect to receive an electronic copy of the Proxy materials online at www.proxyvote.com, or contact your broker.

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00-04-1376B 3/2019