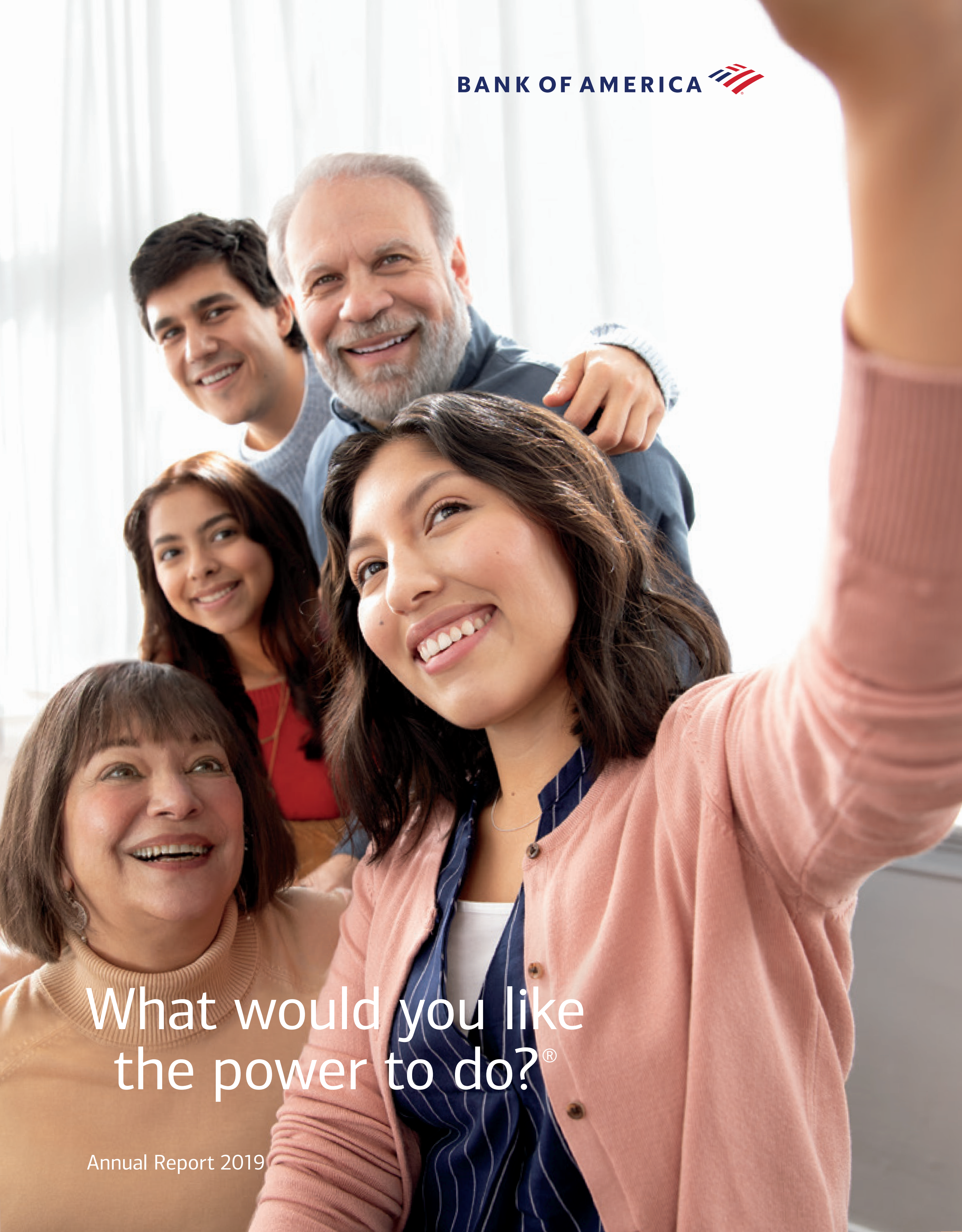
BANK OF AMERICA
What would you like the power to do?®
Annual Report 2019

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To our shareholders and clients,
To my teammates,
To leaders and partners in the communities we serve across the U.S. and around the world,

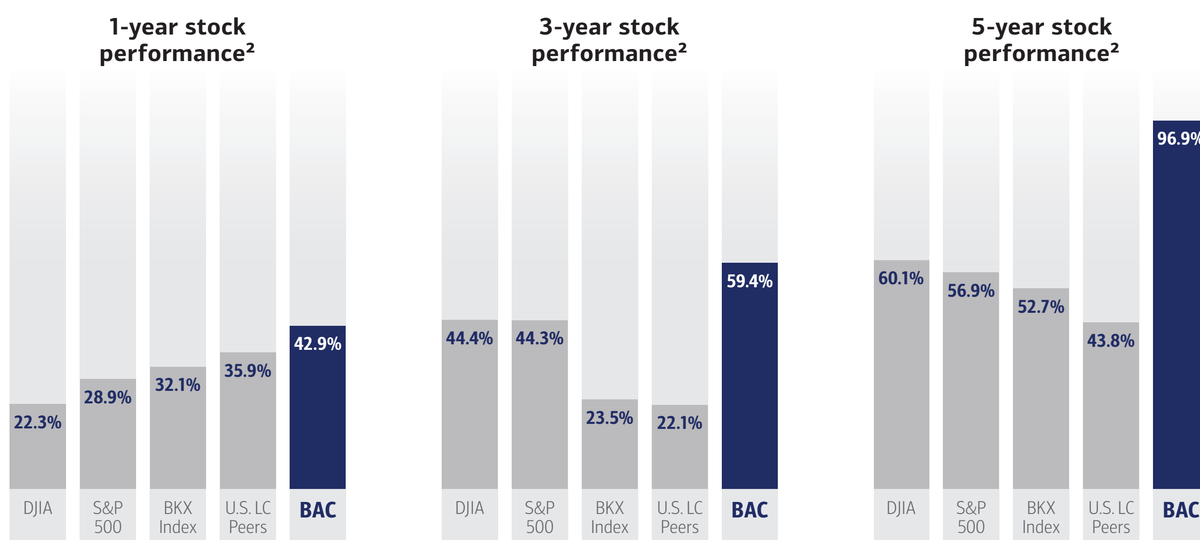
I am pleased to share the 2019 Bank of America Annual Report with you. In this report, my teammates and I share highlights of the progress our company made during the year, which capped off a decade of growth for our company and for the U.S. and global economy.

In 2019, your company followed its Responsible Growth operating principles and delivered $27.4 billion in earnings, or $2.75 per share. After adjusting for a third-quarter non-cash impairment charge, we earned $29.1 billion.[1] That adjusted figure exceeded our record 2018 results. We returned more than $34 billion in capital to you, our shareholders, including $28 billion in share buybacks and $6 billion in common dividends. We raised the annual dividend by 22%, from $0.54 to $0.66 cents per share. Through our capital deployment over the last few years, we reduced the number of outstanding shares to below 9 billion last year, 2.5 billion fewer than at the peak. We committed to you that we would wring out the share dilution caused by the increased capital levels required under the new capital rules and the shares we issued to rebuild our base of capital last decade. We remain committed to that reduction and will accomplish it while continuing to invest in our company.

We enter 2020 with strength and momentum after a decade of transformative change. Our capital, liquidity and capacity to serve clients are excellent, and we are delivering strong earnings. Our products are best in class, and we continue to improve them. Our team gets stronger every day, as we continue to invest heavily to make sure we are the best place to work.

Over the course of the decade that just ended, we earned $127 billion and returned $97 billion to you, our common shareholders, and $111 billion to you and our preferred shareholders together. The rest is in our capital base to serve our customers. Our stock returns have also been strong and you can see our one-, three- and five-year charts below. We have balanced our risk and streamlined our company, and our returns are well in excess of our cost of capital.

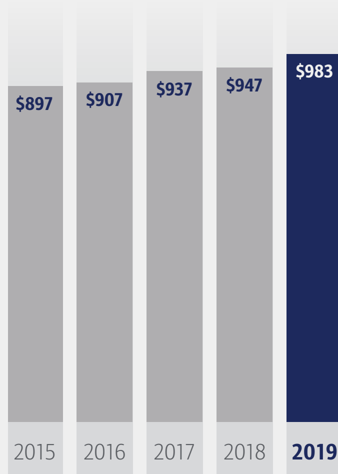
What a difference a decade makes.

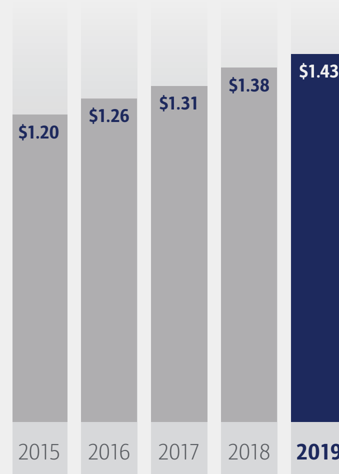


[1] The $29.1 billion net income represents a non-GAAP financial measure, as it excludes the third-quarter $2.1 billion pre-tax, $1.7 billion after-tax, non-cash impairment charge related to the notice of termination of our merchant services joint venture which increased noninterest expense and is included in the reported net income of $27.4 billion.

[2] U.S. large cap (LC) peers include JPM, C, WFC, GS, and MS.

Client activity was strong across all business lines, allowing the benefits of our growth in loans and deposits to offset the impact of lower rates.





Those accomplishments are due to our team. It starts with our dedicated group of independent directors, led by **Jack Bovender**, our lead independent director. You can see the board's commitment to our strategy in Jack's letter on page 7 of this report. I thank Jack for his board leadership; his term runs through our 2021 annual meeting. Jack's leadership is stellar, and his eventual successor will have big shoes to fill.

Our team includes the 208,000 teammates who work tirelessly every day to serve our customers well and deliver the returns for you. They are led by a talented management team, many of whom share their insights about our company in this report. I thank the board and the management team for the work they do on behalf of our company.

At Bank of America, we focus on results and we focus on how we deliver them. One of the things we should all be proud of is how we have delivered for our traditional stakeholders, customers, teammates and shareholders, and how we delivered for the broader society at the same time. A concept we embrace — the "genius of the and"[3] — applies to how we are delivering for customers, for teammates, for shareholders, AND for our communities and the society in which we operate.

In a separate note on page 9 of this report, I offer a more extended discussion that addresses questions being raised about whether the challenges we face are so profound that our capitalist system itself is incapable of addressing them.

While we must acknowledge and address some short-comings within our capitalist system, I will discuss our belief at Bank of America that the remedies to these shortcomings are found within capitalism itself.

So how does Bank of America produce these results? We do it by delivering on Responsible Growth. Let's discuss how we did in 2019.

Responsible Growth

Our 208,000 teammates delivered the 2019 results I mentioned earlier — $29.1 billion in adjusted earnings and $34 billion in capital returns to you — through their disciplined focus on Responsible Growth.

[3] This is a concept developed by Jim Collins in his book *Built to Last: Successful Habits of Visionary Companies.*

Responsible Growth has four straightforward tenets:

We have to grow — no excuses.

We have to be client focused in our growth.

We have to grow within our risk appetite.

And our growth must be sustainable, which has three elements: 1) we have to drive operational excellence; 2) we have to be a great place to work; and 3) we have to share our success with our communities.

Grow and win in the market — no excuses

The first pillar of Responsible Growth is to grow, no excuses. And we did that in 2019. Client activity was strong across all business lines, allowing the benefits of our growth in loans and deposits to offset the impact of lower rates. Average deposits grew $65 billion, or 5%, year over year. We have grown deposits every quarter over the prior year by more than $40 billion for nearly five years now. Average loans were up 3% last year, again led by Consumer Banking, where average loans grew 6%. **Dean Athanasia**, who leads Consumer Banking and Small Business, shares some insights in his Q&A on page 14 about how we continue to deliver for retail and preferred clients and small business with innovation and great service.

We saw commercial loan growth last year of 4% and a 10% increase in our lending to small businesses and loans to middle market clients. We are proud this year that we became the largest U.S. lender to small businesses, the lifeblood of the American economy. We also became the largest commercial and industrial lender in the U.S. Our growth efforts continue to bear fruit as we added hundreds of commercial and small business bankers across our footprint. And you can rest assured, we have done so by staying within our risk appetite, as I will discuss below. In a Q&A on page 22, Chief Operating Officer **Tom Montag** discusses the investments we are making to deepen our client relationships and the other opportunities ahead in our Global Banking and Global Markets businesses.

Each of our businesses contributed to our strong earnings last year. And most of them grew their market share while producing good bottom-line growth. Consumer Banking earned $13 billion last year by deepening relationships with our clients while we continued to invest in infrastructure and client capabilities. Our wealth management teams saw net new household growth of more than 20% last year, earning record income of $4.3 billion with average client deposits up $15 billion.

Our Global Banking business earned $8.1 billion, and our Global Markets business earned $3.5 billion. Combining the results for these businesses, as other financial services companies report them, would result in $11.6 billion for 2019.

We must grow and remain customer focused

We deliver Responsible Growth by focusing on our clients and what they need to live their financial lives. All our growth is organic. We call it growth that will stick to our ribs, not run off. We are seeing the results of our client focus in many areas. Client satisfaction scores across our eight lines of business, for instance, are at an all-time high. Our brand continues to be very strong. We see continued gains in attracting new clients, and importantly our current clients continue to do more with us. That means we are doing a great job for them.

Our 65,000-strong team in our consumer businesses has grown Consumer Banking checking balances 44 consecutive quarters. At the end of 2019, Consumer Banking held more than $700 billion in deposits. Our 66 million consumer and small business clients value our online and mobile capabilities along with the convenience of 4,300 financial centers and more than 16,800 ATMs. In addition to this high-touch capability, our clients value the high-tech capabilities we offer. We interact with our clients almost 28 million times every day, and 81% of these interactions come from our 38 million active digital banking clients. Our clients benefit from our investments in artificial intelligence (AI) to help personalize their individual financial habits, goals and priorities. Clients who use Zelle® for sending and receiving money through their mobile phone made 300 million transfers representing $78 billion last year. Our AI-driven digital assistant, Erica®, was launched in 2018, and we topped 10 million users last year, while roughly 10 million clients are active users of Zelle. More than 55% of our total consumer client payments are made digitally. This is more than $1.6 trillion moved digitally by Bank of America consumer clients each year.

Of our total deposit transactions, 27% were done through our mobile channels, and 79% through mobile and ATMs together. More than 50% of our clients have gone paperless. Digital channels generated 29% of overall sales, with 34% of mortgages and 56% of auto loans now originating in our mobile app or online banking site. Customers also arranged more than 2.3 million appointments through digital and mobile in 2019, up 19% from 2018. This enables our teammates in the financial centers to efficiently address the more complex needs of their clients in person and contributes to a better client experience.

There is much talk about what happens to traditional banks when digitization occurs. You can see that in the statistics above. We are enabling our clients, and the teammates who serve them, with the best, most comprehensive high-tech digital capabilities, while investing and advancing high-touch service through financial centers and other channels, for an unmatched

range of access that reflects the many ways clients choose to do business with us.

Client-centered growth drove our results in our wealth management businesses, too. Wealth management client balances exceeded $3 trillion for the first time. The Bank of America Private Bank saw an increase of 64% in net new households, while Merrill saw a 25% gain. Merrill alone brought in more than 40,000 net new affluent households, and we added 60% more private bank relationships in 2019 over 2018. Our wealth management clients benefit from a high-touch and high-tech mix, too. Household mobile usage was up 39% in the private bank and 44% in Merrill, and we had the most top advisor rankings in the industry. For a deeper look at how we are transforming wealth management, look for a discussion on page 16 with **Katy Knox**, president of Bank of America Private Bank, and **Andy Sieg**, president of Merrill Lynch Wealth Management.

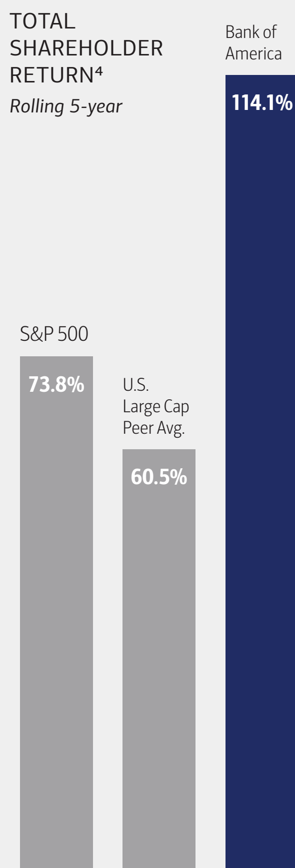
We're driving deeper client engagement with our Global Banking and Global Markets teams, too. Our teams continue to grow loans, adhering to our risk framework that is more stringent than industry averages. They are growing transaction services fees nicely, too. In investment banking, we have gained share of the global fee pools with a successful retooling of the business.

We are the largest U.S. commercial lending business and have one of the top market-making and investment banking platforms that can deliver for clients globally.

Global Banking deposits grew $23 billion, a reflection of the hundreds of additional relationship bankers we have added in the U.S. and globally in the last several years. Our Global Markets business serves our clients well and last year made money on 98% of the trading days.

Grow while staying within our risk appetite

Growing within our risk appetite is another tenet of Responsible Growth. Our loan losses are at historic lows. Asset and credit quality are strong across our consumer and commercial portfolios, and our capital and liquidity are much higher than a decade ago. Even as we returned $34 billion to shareholders last year, our Tier 1 common equity ratio was 11.2%, well above our 9.5% minimum requirement. We continued to use our operational excellence work to drive operational risk out of the company. We are growing the right way.



Growing in a sustainable manner

Earlier I stated the three tenets to growth that is sustainable. They are 1) drive operational excellence, 2) be the best place for teammates to work, and 3) share our success with our communities. The combination of delivering all the results I've discussed rests upon a bedrock of this pillar of Responsible Growth. This ensures that we are investing long term, while delivering near-term results. This tenet ensures that we deliver for all our constituencies. And this tenet ensures we have the best team.

Operational excellence

Operational excellence generates savings and efficiencies that make it possible for us to continue to invest. By improving the way we serve clients, streamlining our internal processes and creating other efficiencies that stem from the thousands of ideas our teammates generated last year, we were able to invest in our capabilities even as we managed our expenses consistent with the $53 billion target for 2019, which we set in 2016. This has been a continuous process of improvement.

[4] Total shareholder return includes stock price appreciation and dividends paid. U.S. large cap (LC) peers include JPM, C, WFC, GS, and MS.

We continue to use our operational excellence work to drive operational risk out of the company. We are growing the right way.

Since the beginning of 2010, we have invested $30 billion in new technology initiatives, including the mobile and digital capabilities we highlight throughout this report.

In addition, in just the last year, we completed the upgrade of our network of more than 16,800 ATMs and added 900 new ones, while modernizing more than 500 of our financial centers and opening 90 new ones. We continue to add financial centers in new markets starting where we already have wealth management and business clients — all made possible by savings from our focus on operational excellence. For instance, we opened our first financial centers in Ohio in 2019, and plan to open more than 30 centers in Cincinnati, Columbus and the Cleveland area over the next two years. We added about 100 ATMs in the state in the last year and a half.

The investment in our financial centers and ATMs goes beyond modernizing existing centers and building new ones. It connects all of our client services and experiences and creates the opportunity to build on existing relationships, attract new ones and acquaint clients with Preferred Rewards, which rewards members for doing more with us across their entire banking relationship.

As our clients' needs and expectations evolve, the financial center client experience and design has to evolve with them. Every day, 800,000 clients visit our financial centers. The financial centers continue to evolve to better serve the range of needs of our clients. Last year, we developed 1,500 "One Team" financial centers with dedicated wealth management, Business Advantage and consumer lending specialists to make it easier for clients to connect across all our products and services.

Another example of the type of investment that operational excellence helps generate is our Aira service — a new technology to help blind and low-vision clients gain better access to our financial centers and ATMs. Aira delivers instant access to visual information at the touch of a button. This free service connects these special needs clients with visual information on demand.

At the same time, we are making investments in technology to optimize the digital experience for chief financial officers and treasurers of our corporate clients. Some 500,000 clients now use CashPro®, our digital application for our business client treasury and lending needs. Mobile CashPro logins grew more than 100% year over year. Adoption of other new tools relying on AI and machine learning for corporate clients is growing even faster.

Even as our team maintained expense discipline over the past decade, we continued to invest in our people, our technology, infrastructure, buildings and facilities,

and in helping make progress on many societal priorities. And — by the way — we made these investments while returning our excess of our earnings to you — $34 billion — through dividends and buybacks. A company like ours can invest and manage its capital.

Here are a few highlights of investments we made for 2019 alone:

- We made $1.7 billion in capital investments in new and modernized facilities in 2019. This past decade, we invested in new buildings in Charlotte, Dallas, Houston, Chicago, Paris, Hong Kong and many other markets. We modernized more than 1,300 financial centers the last three years, and the plan we announced in 2016 to upgrade and expand our entire financial center and ATM network by 2021 is on track.
- In 2019, we added 3,600 new teammates. We hired 32,000 employees, including 6,300 new employees from low- and moderate-income neighborhoods, and 4,000 college and MBA graduates. We passed a major milestone of our 100-year support for the military, and reached our five-year goal to hire 10,000 military veterans.
- For our employees, it was the third consecutive year in which we recognized approximately 95% (all but the top 5% paid) of our teammates for driving Responsible Growth with a special compensation award. (In total, more than $1.5 billion in the last three years.) In the first quarter of 2020, we raised our minimum starting salary to $20 per hour, up from $17 per hour in 2019.

As you can see, operational excellence allows us to deliver industry-leading efficiency, while investing heavily. And that serves us well no matter what environment is ahead of us.

A great place to work

Being a great place to work is another driver of sustainable Responsible Growth. To provide the best service to our clients and to support the communities in which we operate, we must continue to attract and retain the best talent. Being a great place to work includes our ongoing commitment to developing and managing talent, employee engagement, equal pay for equal work and core values anchored in our commitment to diversity and inclusion.

In 2019, we published our first Human Capital Management Report. Throughout the report, we provide detailed information about the actions our company has taken for teammates and their families across the globe. I encourage you to review it carefully; there is additional detail and insight throughout this report as well.

To highlight one area of focus, since 2012, there has been no increase in medical premiums for teammates earning less than $50,000. For all teammates, we vary the medical premium contribution by annual pay level, with larger company subsidies for those earning less. Also, our average contribution increases since 2012 have been below national health care trends. Another area of focus in the report is the progress we continue to make to ensure diverse representation at all levels of our company, including a board of directors and management team who are more than 45% diverse. Additionally, women comprise more than 45% of the management team and 40% of the top three levels of our company.

We saw significant internal and external awareness for being a great place to work. In 2019, the Diversity & Inclusion Index in our 2019 Employee Engagement Survey was the highest it has ever been. Bank of America also was the top financial institution in the 2019 LinkedIn Top Companies list, which recognizes the most sought-after places to work.

Sharing success

One way we share our success is through our local market and country teams and their support of local partners through community development lending and philanthropy. Over the last decade, we have provided around $50 billion in community development lending, including for priorities in affordable housing and economic mobility, and $2 billion in philanthropy. Last year alone, we delivered nearly $5 billion in community development financing for affordable housing and other community priorities, and made more than $250 million in philanthropic contributions. Our employees directed more than $60 million through individual giving and matching gifts and logged nearly 2 million volunteer hours to strengthen local communities.

Sharing success also includes the work we do in our Environmental Business Initiative. In 2019, we met our 10-year, $125 billion environmental business initiative — six years ahead of schedule. We established a new target of $300 billion in clean energy finance by 2030. Consistent with the objectives of our Environmental Business Initiative, we have met our 2020 goal of becoming carbon neutral in our own activities. Look for a discussion on page 24 with Vice Chairman **Anne Finucane**, who leads our sustainable development work and co-chairs with **Tom Montag** our broader work in sustainable finance, on the leadership we bring to driving progress on the societal priorities through our core financing and other activities.

A message from Lead Independent Director Jack Bovender

Dear fellow shareholders,

As the lead independent director and on behalf of the independent directors of Bank of America Corporation, thank you for choosing to invest in Bank of America. The directors comprise individuals representing a diverse range of informed expertise. Sixteen of the 17 directors are independent; 65% have CEO-level experience; and 35% have senior executive experience at financial institutions.

Your board reviews and approves the company strategy as presented by the management team each fall. The directors oversee the execution of the strategy by engaging in a year-round strategic assessment and planning process. Throughout 2019, our dialogue at the board and with the company's management included regular review of the company's adherence to its tenets of Responsible Growth, including risk management and environmental, social and governance practices. We remain abreast of developments in markets, the economy and geopolitical issues that may affect them. We discuss and assess trends in the financial services industry, all with an eye toward ensuring the long-term, sustainable value of the company.

I also meet regularly with shareholders and gather viewpoints that I share with the board. This direct engagement with shareholders provides feedback on executive compensation, capital allocation and other important matters. That feedback informs our board meeting agendas and helps enhance our governance discussions. You will find extensive discussion of all of these matters throughout this annual report and in our 2020 Proxy Statement. I encourage you to review this material carefully.

On behalf of the directors, I join Chairman and CEO Brian Moynihan and the management team in thanking you again for your investment in our company.

Sincerely,

Jack O. Bovender, Jr.

In the United States, one of the important ways we engage and share success in the communities we serve is through our market president organization. Our network of 90 market presidents is responsible for leading an integrated team to deliver for clients, teammates and the community, serving as the chief executive for Bank of America in that market. You will see a more detailed discussion of how our market president organization does this through the experience of **Raul Anaya**, our Los Angeles market president, on page 21.

External recognition

Because of our investments in our capabilities and in our people, in 2019 we received recognition in many areas, including for our products and services, for our commitment to our team and to diversity and inclusion, and for our contributions addressing important societal priorities.

We are proud that Global Finance recognized Bank of America as the Best Bank in the World in 2019. In early 2020, Fortune named your company to its list of the 100 Great Places to Work, and as the only global financial services firm on its list of the top 18 Best Big Companies to Work For.

Also last year, our research team was recognized as Top Global Research Firm by Institutional Investor, an honor we held for most of the last decade, including each year from 2011 to 2016.

Global Finance also named Bank of America the Best Consumer Digital Bank in America and Money magazine ranked us the Best Bank for College Students. Reflecting our focus on managing risk well, for ourselves and for our clients, we earned prestigious recognition from Risk magazine, which named us Derivatives House of the Year, Equity Derivatives House of the Year and OTC Client Clearer of the Year.

The external recognition includes several areas that reflect our commitment to being a great place to work, another tenet of Responsible Growth. Euromoney named us the World's Best Bank for Diversity & Inclusion, and Forbes included us in their JUST 100: Companies Doing Right by America ranking of how the country's largest publicly traded companies perform in important areas including fair wages, acting ethically and setting the standard in stakeholder treatment.

Looking ahead to 2020

I hope you'll enjoy reading about your company in the following pages, where you can look at how we're helping make financial lives better through every connection.

Our performance and recognition took place against a backdrop of a growing U.S. and global economy, driven by solid consumer spending. While geopolitical and trade uncertainty remains, we saw some of it clear up as trade agreements with Canada, Mexico and China were concluded in 2019.

There are factors beyond our control that impact the markets and economies in which we operate. As this report is being completed, we are experiencing volatility because of uncertainties around the impacts of the coronavirus. We are taking the necessary measures to look after our employees and serve them as this situation develops.

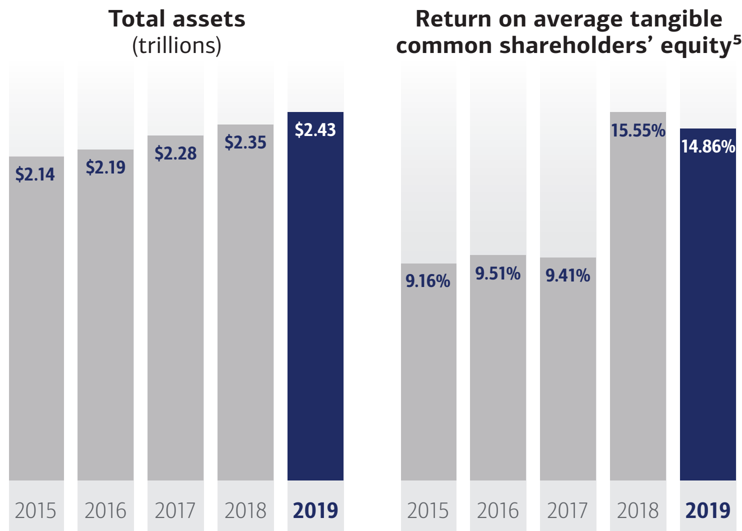
Despite headwinds that may arise from time to time, over the last decade we have built a strong, stable platform, with significant liquidity and capital, and we will remain resilient as we maintain disciplined focus on what we can control, which is embedded in delivering Responsible Growth.

As we look ahead to 2020 and beyond, we will maintain our focus on delivering Responsible Growth through disciplined adherence to the tenets I've discussed: by serving our clients, managing risk well and ensuring those results are sustainable through operational excellence, being a great place to work for our teammates, and sharing our success. The three-year company strategy that our board of directors reviewed in the fall of 2019 is based on continued adherence to this approach. And as always, we will continue to learn what is most important to those we serve by asking:

What would you like the power to do?

Let me know at brian.t.moynihan@bofa.com

Brian Moynihan
March 3, 2020



[5] 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 48 and Non-GAAP Reconciliations on page 101 of the 2019 Financial Review section.

A message from Brian Moynihan: Responsible Growth and stakeholder capitalism in action

What would you like the power to do?

Our core job is to ask this question of our teammates, our clients, our shareholders and the communities we serve. By listening to the answer, we learn what is most important to them. And then we try to help them do it.

Our clients want the best capabilities, services and ideas to help them live their financial lives.

Our employees want to be able to bring their authentic selves to work and to create a good life for themselves and their families with competitive compensation and benefits.

Our shareholders want the best returns on their investment in Bank of America.

By driving Responsible Growth, we deliver for these stakeholders.

At the same time, we also serve broader society. We must tackle important societal priorities, such as affordable housing, economic mobility and a clean energy future. And we are. There is a lot of discussion today about the best ways to mobilize the resources needed to address these challenges. The discussion includes questions about how effective our capitalist economic system is at prioritizing these needs and whether we need to think differently about it. Simply stated: Can capitalism address the most challenging societal priorities, or might we need to think about another economic model?

In 2019, the Business Roundtable in the U.S. issued a Statement on the Purpose of a Corporation. Bank of America is a member of the Business Roundtable, and I signed the statement, because it reflects the way our company has operated for many, many years. The statement is straightforward, and I encourage everyone with an interest in Bank of America to read it.

The Business Roundtable issued its statement in the context of this ongoing discussion about capitalism. In that context, the statement has been interpreted in some quarters as a step away from the important responsibility we have to deliver the best financial returns to our shareholders so that companies can focus on other, “more important” societal priorities.

At Bank of America, we reject that false choice. The simple fact is that at Bank of America, we believe we must continue to deliver great returns AND help drive progress on societal priorities. There is ample evidence to suggest the wisdom of this approach. The BofA Global Research team — ranked number one in the world by Institutional Investor for seven of the last nine years — has published a series of research reports demonstrating that companies that pay close attention to environmental, social and governance (ESG) priorities are much less likely to fail than companies that do not.

At Bank of America, we believe capitalism is best at creating opportunity for people to realize their hopes and dreams. We believe if we keep aiming capitalism’s power toward the challenges we face, we can make significant progress on society’s most pressing problems.

Bank of America’s role in that system is to help all of our stakeholders — our clients, shareholders, teammates and those in the communities where we operate — grab the opportunities they see for themselves by helping with their financial lives.

We also believe, though, that it is important to acknowledge questions being raised, such as:

- How do we ensure equal access to opportunity?
- Are companies sharing their success equitably with their employees?
- Are we doing all we can do to accelerate the transition to a low carbon, clean energy economy?
- What will happen to today’s employees as technology advancements change the nature of work?
- Can companies hold themselves accountable through strong self-governance?

These discussions are at the heart of the policy debates in legislative and executive bodies around the world. These are concerns for our clients, our communities and increasingly for our shareholders. Our teammates discuss them with their families and with each other.

How do we ensure the opportunities are available to all and that we harness the energy of capitalism to address society's concerns? These issues can be solved if the private sector is engaged and helping to drive forward. But it has to be done the right way.

Which brings me back to our question.

What if we asked the world: "What would you like the power to do?"

The answer might be summed up in what the U.S. and nearly 200 other countries agreed to at a summit in 2015 when they set forth the Sustainable Development Goals (SDGs). The SDGs represent 17 categories of societal priorities that address equality of opportunity… access to clean water…renewable energy…affordable housing…and other priorities, with specific goals to be met. World leaders agreed that these goals are the ones we need to address to build a sustainable future and create opportunity and prosperity for all.

The SDGs are estimated to require about $6 trillion annually of investment capital. This will take all sectors of society. Certainly philanthropy and governments have critical roles to play, but all annual charitable contributions in the world total just over $800 billion. Total global non-profit foundation assets are about $1.5 trillion. Even if annual charitable contributions and every endowment and foundation in the world were directed toward reaching the SDGs and no other priorities — not the arts, not additional medical causes, not any of the other worthy priorities that get support today — we still would fall far short of what is needed.

Governments alone also cannot address the challenges laid out in the SDGs. The U.S. operating budget is the largest in the world at about $4.5 trillion. If all of it were dedicated to the SDGs only — meaning not funding national security, basic research, basic services for the U.S. taxpayers, and not paying the federal debt — we still would fall short of the annual need.

So how can we fund these needs?

The private sector and capitalism.

This goes well beyond corporate philanthropy, as important as that is. Since I became CEO of Bank of America in 2010, we have delivered more than $2 billion in philanthropy to support important priorities in the U.S. and around the world. Our teammates have, with our support, volunteered about 2 million hours of their time each year to non-profit organizations and causes. We are proud of that, but even if every company on the Fortune 500 delivered that amount of philanthropy in a year, we would still fall well short of the need.

What the private sector is doing, and what is reflected in the Business Roundtable statement, is aligning our ordinary business activities to help solve these challenges.

For Bank of America, that means we have to bring our $2.4 trillion balance sheet to bear to the task.

We have to bring our $53 billion expense base to the task.

We have to bring our $268 billion equity base to the task.

We have to bring our trillions a year of capital raising for our clients to the task.

Based on client desires, we have to usher the $3 trillion in assets in our wealth management business to the task.

If all operating companies continue to align themselves to deliver on those SDGs on which they can have the most impact, and if we measured ourselves to be sure we're making progress, we would deliver the capital, the creativity and the expertise to address the world's most pressing challenges.

How does Bank of America do that?

First, we do it with our own operations. We are carbon neutral as of this year. We are reducing paper, we focus on the environmental efficiency of our buildings and we continuously reduce waste.

Second, of course we drive our charity, our philanthropy and volunteering and our nearly $5 billion in annual community development lending and investing to address the areas. You can find those in our annual report.

Third, we do it with our employment and human resources practices, which are well laid out in our 2019 Human Capital Management Report. We employ teammates, support families and their economic development by providing funding for education and many other useful purposes. We provide strong and progressive health and wellness benefits: All teammates get the same plans, and lower paid teammates pay a lot less for them. Other benefits include paid family leave of 16 weeks, industry-leading bereavement benefits and a minimum starting salary of $20 an hour, about $42,000 a year. We make available to our teammates the reskilling resources and opportunities as work

Bank of America is working with the World Economic Forum (WEF) and the accounting firms Deloitte, EY, KPMG and PwC to develop a framework to provide all stakeholders, including shareholders, a consistent method to evaluate the progress companies are making to advance SDG priorities in the areas of human capital, environmental sustainability, governance and other sustainable development objectives.

changes. We hired 10,000 veterans over the last five years. Our hiring in low- and moderate-income neighborhoods has produced more than 8,000 hires in the last two years.

Fourth, we do it with our client financing capabilities — our core activities. We provide examples of that in our annual report. For example, Bank of America is one of the largest underwriters of green bonds, and we have helped companies raise more than $40 billion on behalf of more than 100 clients to provide critical funding on environmental projects.

Another example is in our consumer product design. We have one of the lowest priced checking account options in the industry, with a monthly maintenance fee of just under $5 for access to our banking channels, including mobile, online services, ATMs and financial centers. And our Advantage SafeBalance Banking, introduced in 2014, was one of the first banking accounts to eliminate overdraft fees and non-sufficient fund fees. The account was the primary reason Money magazine named us the “Best Bank for College Students” in 2019. We surpassed 1 million Advantage SafeBalance Banking accounts in June 2019.

Fifth, we help our investor clients find opportunities to drive impact investing, ESG investing or blended finance across the SDGs.

We dedicate all of our business operations to driving great returns for our shareholders AND to addressing these priorities. If each company focuses on delivering both through their individual routine business operations and practices, then we can channel the world’s capital to make meaningful progress on the SDGs.

One important way to ensure we are making progress is to have a basic framework for measuring it. We need to do this so we can demonstrate progress to all stakeholders. With a measurement framework, we can reward the companies that achieve both, as investors can prioritize their investments and capital to companies making progress over those that are not. Remember, the BofA Global Research team has demonstrated that operating companies that don’t pay attention to these priorities are more risky and less predictable.

There is no shortage of ways to measure this progress. This actually has been a barrier to progress, because there is no standard method of gaining alignment between the operators of companies that are doing so much to address these priorities and the investors seeking to direct capital toward them. There is a large and growing number of external forums and bodies trying to advance this work. By some estimates, there will be as many as 600 conferences in the U.S. alone this year to discuss ESG, sustainability, and sustainable business and finance models.

There is a dizzying number of measurement systems and metrics, too. Public companies face requests from many stakeholders — investors, public officials, regulators and developers of their own proprietary measurement systems — that we adopt their preferred metric or routine to address a particular priority. The volume of approaches and the varied metrics and methodologies make it difficult for those of us who operate companies to determine how best to provide consistent reporting. And many of us would rather put our energy into actually making progress on the SDGs than debating the measurement of progress.

Company management teams and the asset owners and asset managers who invest in these companies need a straightforward framework by which to compare non-financial information in these areas across companies in a given industry, and across industries, to determine which companies are making progress on the issues most critical toward ensuring a sustainable global economy.

The International Business Council, which I am privileged to chair, of the World Economic Forum (WEF) has recently addressed this need. The WEF asked the accounting firms Deloitte, EY, KPMG and PwC to develop a framework to provide all stakeholders, including shareholders, a consistent method to evaluate the progress companies are making to advance SDG priorities in the areas of human capital, environmental sustainability, governance and other sustainable development objectives.

Our objective is to develop a scorecard based on a consistent measurement framework for companies to disclose the progress they are making on specific SDGs. Our scorecard is one step toward creating some convergence among the many existing ESG metrics and measurement systems that are available. The experts working on this have identified a narrow and impactful range of metrics from some of the most widely acknowledged measurement systems available. The intent is for stakeholders to have a common set of metrics to measure the material impact that companies are having on the SDGs across and within industries, so that investors and other stakeholders can compare and evaluate progress. This is to simply show how capitalism is aligned generally and how each company is aligned specifically to delivering the progress. The metrics also will help investors evaluate the long-term value and sustainability of companies seeking to make progress on the SDGs.

Just imagine how much intellectual and financial creativity we can harness if we **1)** accept that capitalism is the best way to create access to opportunity for the most people; **2)** acknowledge the shortcomings in our capitalist system just the same; and **3)** address those shortcomings by harnessing the world's capital toward the SDGs agreed to by nearly 200 countries. That's a powerful force for progress.

At Bank of America, we believe it is not only possible but it is the desired outcome for us to serve our clients, deliver for our shareholders AND deliver for the societies and communities we serve. That's Responsible Growth and stakeholder capitalism in action.

Bank of America Board of Directors

Front row (from left): Michael White, David Yost, Maria Zuber, Jack Bovender, Brian Moynihan, Susan Bies, Linda Hudson, Lionel Nowell
Back row (from left): Thomas Woods, Frank Bramble, Denise Ramos, Pierre de Weck, Monica Lozano, Thomas May, Sharon Allen, Clayton Rose, Arnold Donald

What would you like the power to do?

At Bank of America, we ask this question every day of those we serve. By listening to the answers we learn what matters most to people. It's how we deliver Responsible Growth.

Bank of America
Executive Management Team

Front row (from left): Christine Katziff, Anne Finucane, Brian Moynihan, Catherine Bessant, Thong Nguyen, Sheri Bronstein
Back row (from left): Andrew Sieg, Paul Donofrio, Dean Athanasia, Andrea Smith, David Leitch, Kathleen Knox, Geoffrey Greener, Thomas Montag

Consumer & Small Business priorities

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

Q: How are you driving Responsible Growth in Consumer & Small Business?
Dean: We take an integrated high-tech and high-touch approach, offering our clients the convenience of our award-winning digital platform even as we're investing in our network of 4,300 financial centers and approximately 16,800 ATMs. We staff our centers with professionals who can help clients with all their financial needs, from transacting and borrowing for a home, auto or business to saving and investing with Merrill. And we do it all with a passion for client care that extends throughout our organization. At the same time, we're focused on strengthening our communities, because Responsible Growth needs to be both shared and sustainable. And we're investing in our employees' development, because the more capable they become, the more we can do for our clients and communities.

Q: What is your strategy for exceeding expectations for Consumer & Small Business clients?
Dean: Bank of America and Merrill offer clients our full range of banking and investment services wherever and whenever they want, on our mobile app or talking with our expert professionals over the phone, through online chat, in a video conference or face-to-face in one of our new and upgraded financial centers. And then we provide extensive rewards and benefits across their entire relationship with us through programs like Preferred Rewards— the more they do with us, the more their benefits grow. These are among the many reasons we have been able to grow average Consumer Banking deposits by more than $155 billion over the past five years, nearly 70% of that in Checking.

66M	38M	4,300	25,200
Consumer and Small Business clients	*Digital banking clients*	*Retail financial centers and 16,800 ATMs (with about 1/3 located in LMI communities)*	*Client professionals offering advice for investments, lending and small business in our financial centers*

Behind the scenes, we're taking advantage of the latest advances in artificial intelligence (AI), machine learning and business intelligence to enable us to deliver personalized, client-specific insights, recommendations and resources during moments that matter. Our virtual AI-driven financial assistant, Erica®, uses all this intelligence to deliver a personalized experience for each and every client.

Q: What are you doing to support the communities where you do business, especially low- and moderate-income communities?
Dean: We are helping to empower economic mobility for our clients and small businesses through a community-centered approach that offers resources tailored to meet their needs. Our strategy is designed to connect clients with products and services, employment opportunities and capital to increase financial resilience and help our local communities thrive.

That means being focused on the needs of diverse communities. We serve 9.5 million Hispanic-Latino individuals and more than 1 million Hispanic business owners. In 2019, our market share as the primary bank for U.S. Hispanic-Latino consumers grew to 21%, maintaining our industry-leading position. And by the end of 2019, we had more than 2 million users of our Spanish-language mobile app, a 23.5% increase over the prior year.

It also means being focused on underserved communities. Today, roughly one-third of our financial centers and ATMs are located in low- and moderate-income (LMI) neighborhoods, and 33% of our financial center employees work in these locations. In the rural markets where we work and serve, we have 235 financial centers, 820 ATMs and over 1,500 financial center employees. Across our network, nearly two-thirds of our financial centers are staffed by teammates who speak more than one language. Of the total number of multilingual associates, 81% work in our centers located in LMI areas.

Q: How can employees develop and advance their careers at Bank of America?
Dean: We're helping our teammates in Consumer & Small Business, Merrill and the Private Bank build great careers at Bank of America through The Academy, our award-winning coaching and development organization. Academy programs provide robust coursework taught by subject matter experts, dedicated training time for frontline employees — each teammate receives a minimum of 80 hours of training when taking on a new role and up to 1,000 hours in the first five years, depending on the career path — in addition to peer mentoring and coaching. We also offer hands-on, high-tech immersion training programs using virtual reality and client engagement simulators, which is a first for our industry.

More than 45,000 teammates participated in Academy programs in 2019, with nearly 11,000 advancing in their careers as a result.

We encourage employees to consider their opportunities inside our company. Managers are expected to have that conversation with their teams, so they understand the opportunities they have to learn more about a different position in the market where they live, across all of our lines of business. We want employees to think about their career opportunities within our company, and we are empowering them and their managers to help them gain the training and the resources to do that. As a result, we're seeing the highest employee engagement scores and lowest turnover we have ever experienced, even in an environment with low unemployment.

Our investment in our teammates is helping us better serve our clients and the communities in which we live and work, providing more professional expertise and improving client care in every interaction.

Transforming wealth management

Q&A with Katy Knox, President of Bank of America Private Bank and Andy Sieg, President of Merrill Lynch Wealth Management

Q: How is the wealth management landscape changing?
Andy: The demographics are shifting. More people are saving, investing and passing wealth on to the next generation, and the financial power of women is growing. At the same time, financial planning factors are evolving in a way that people want more information and greater choice in how they receive financial advice. These range from brokerage to online robo-advisors, to high-tech and high-touch full-service advisory relationships. And, clients want an integrated set of banking and lending services to help them meet their financial goals. The result is transformational; it's a golden age for advice, with the advisor helping clients make smarter decisions.

Q: How are your businesses aligned to capitalize on these opportunities?
Katy: Our goal is to enable individuals, families, business owners and institutions to preserve and share their wealth, build legacies and plan for growth and success. We bring together business lines across Bank of America — Consumer Banking, Business Banking, Global Commercial Banking, Global Corporate & Investment Banking and Global Markets — to harness all of our resources designed to meet our clients' needs. It's a tremendous advantage to be able to holistically address both business *and* personal needs. From growing a business for the next generation, to unlocking capital in an art collection, to giving with passion and purpose, we help clients with their connected priorities.

Andy: Last year was a record year for Merrill in client balances, revenue and net income. We're in an era where Merrill advisors can serve as indispensable partners over their clients' entire financial lives. We can provide clients the finest advice and service — investment management and access to banking, credit and lending — all through their advisor or the other channels we offer clients to interact with us. In today's world, even the most astute families feel challenged by high-stakes financial decisions. That's why you see more and more people looking for comprehensive advice from a single relationship. That's what we offer our clients in a way no one else can.

Q: How is the company helping clients looking to transition wealth to the next generation?
Katy: We've helped individuals and families pass down their values across generations for more than 200 years. To meet a family's financial goals, our Private Bank specialists draw upon their experience and expertise in wealth structuring, investment management and credit and banking to create a thoughtful, comprehensive wealth plan. For business owners, we offer strategies to plan for a business transfer while keeping clients' personal and family needs top of mind. For families with significant wealth, complex assets and ownership structures, the Bank of America Private Bank Family Office provides the highest level of expertise and service.

Q: How are your digital capabilities enhancing the wealth management client experience?
Andy: Clients, especially those with complex wealth needs, want a personal connection plus the convenience that technology offers. In the age of smartphones and mobile apps, Merrill clients can easily see their investment and cash accounts across the company, keep track of their financial goals and engage their advisor teams when and how they choose. Also, Merrill's digital tools save our clients precious time by enabling them to quickly scan and sign documents and securely chat with their advisors through text.

Katy: The Private Bank offers that same digital experience, with features such as seamless money transfers, document scanning, educational podcasts and integration of charitable gift fund accounts. As we look toward an increasingly digital future, we've made it easier for clients to have online access to their accounts across wealth and banking. Secure messaging between our advisors and clients facilitates a new type of relationship, including real-time engagement when that is what clients want.

Personalized banking, digitally delivered

Digital is more important than ever. Today, clients expect the best mobile and digital technology in their financial relationships, just as they do in other areas of their lives. Our award-winning high-tech capabilities — our digital services earned 34 industry accolades in 2019 alone — together with our high-touch approach are making banking better and delivering a more intuitive and efficient experience for our clients across all channels.

Three core principles guide how we develop and deliver each digital experience: The information and advice we provide should be in the best interest of the client, timely and relevant, and offer a choice of the next best step.

Our digital platforms bring never-before-possible convenience to our more than 38 million digital clients, including more than 80% of our small business owner clients. Significant investments in our user interface (UI) and artificial intelligence (AI) allow us to deliver a digital experience with powerful simplicity and groundbreaking personalization.

Our virtual AI-driven assistant, Erica®, is the engine that enables this personalization at scale, delivering valuable client-specific insights and advice at key moments. Clients interact with Erica through voice, text chat or on-screen gesture, receiving help with their banking needs and proactive insights to help make managing finances easier and meet savings goals. For instance, Erica detects duplicate charges on an account and notifies clients if their spending is higher than usual or their checking account balance is trending toward $0. Erica can also assist with common inquiries, including billing disputes, fees, deposit holds and transaction-related questions. Since launching in 2018, Erica has already helped more than 10 million clients complete over 100 million requests.

In 2019, clients logged into our digital platforms more than 8 billion times, deposited more than 140 million checks through Mobile Check Deposit, and sent and received over $78 billion using Zelle®. More than one-quarter of all new products are provided through digital channels, including auto loans and home mortgages.

In February 2019, we launched Business Advantage 360, our one-stop digital dashboard for business owners, and we recently enhanced the platform with the ability to integrate data from key third-party business applications. Since the launch, more than 1 million business owner clients have used Business Advantage 360, and Barlow Research recently named Bank of America No. 1 in Small Business Mobile Banking Adoption among the top 10 U.S. banks.

Our digital and mobile capabilities are aligned with the capabilities clients receive in a financial center, too. For example, clients can use our mobile app to easily book an appointment with an employee to discuss a specific matter in a financial center. Alternatively, an employee in the financial center can discuss and save products to a client's digital shopping cart, and the client can complete the application digitally at a later date.

Building rewarding relationships

The more clients do with us, the more their benefits grow. Our approach to deepening the relationships we have with our clients rewards them by recognizing the value of their entire relationship. This sets us apart from our competitors. Preferred Rewards is a first-of-its-kind relationship-based approach that provides members with extensive rewards and benefits across their deposit accounts, investments, credit cards, mortgages and auto loans, along with exclusive discounts.

Launched in September 2014, the Preferred Rewards program has over 6 million members, representing $501 billion in assets as of Dec. 31, 2019. The program allows and encourages members to get more from their banking relationship. On average, members hold about twice the number of banking products as nonmembers and show higher levels of satisfaction with their banking experience. Our retention rate for Preferred Rewards members was close to 99% at the end of last year and, in a 2019 bank survey, 8 out of 10 members told us they are "highly likely" to recommend Bank of America to friends and family.

Preferred Rewards for Business is having a significant impact, as well. During the program's inaugural year, we rewarded participating small business clients with approximately $175 million in benefits, in recognition of the tremendous value of their relationships with us. Preferred Rewards for Business was recognized in 2019 by Barlow Research with a Monarch Innovation Award in the "Business Banking Most Innovative Product" category.

Clients can also use My Rewards, an easy-to-use tool that tracks the rewards they have earned across Preferred Rewards, credit cards, BankAmeriDeals® and Preferred Rewards for Wealth Management. This information is conveniently presented in our Mobile Banking app. Since My Rewards launched in 2018, 17 million unique users have reviewed their rewards, with 65% being repeat users.

Making financial lives better in underserved communities

Core to how we drive Responsible Growth is ensuring it is sustainable. We do that through operational excellence, which creates the savings we generate to reinvest in serving our clients and in our capabilities. We ensure sustainability by being a great place to work for our teammates, which we discuss in more detail throughout this report. And sustainability is driven by the ways we share success with the communities in which we operate.

Our approach to serving low- and moderate-income (LMI) neighborhoods reflects all these elements of sustainability. LMI neighborhoods include more than 8.4 million unbanked households and 24.2 million underbanked households.[1] Today, about one-third of our financial centers and ATMs are located in LMI neighborhoods and 33% of our financial center teammates work in these locations. With the anchor of that physical presence, we serve these communities in several ways by providing:

- Access to secure, transparent and affordable products, including credit
- Personalized financial education and tools
- Employment and business opportunities

Secure, transparent and affordable products

Through our digital banking platform and strong community presence, we offer all our clients access to secure, transparent and affordable products that can be personalized to meet their unique needs. For example, Bank of America Advantage SafeBalance Banking® is a checkless bank account that helps clients avoid overdraft fees. SafeBalance Banking includes a debit card and has unlimited access online and mobile services, financial centers and more than 16,800 Bank of America ATMs.

To help increase access to affordable and sustainable homeownership, in April 2019, we announced the $5 billion Bank of America Community Homeownership Commitment™ to benefit LMI homebuyers over the next five years. The initiative will help more than 20,000 individuals and families achieve homeownership through grants that directly assist homebuyers with their down payments and closing costs. At the end of 2019, the program helped over 9,000 new homeowners with $2.3 billion in mortgage lending.

Personalized financial education and tools

Through Better Money Habits®, we support people in becoming more financially resilient by connecting them to the tools, resources and education they need to help achieve their financial goals. This includes content to assist with budgeting and saving, homeownership, reducing debt, and retirement goals. Better Money Habits empowers people to evaluate their life priorities, such as family, health and home, and helps them determine how they should approach their finances. All content is available in both English and Spanish.

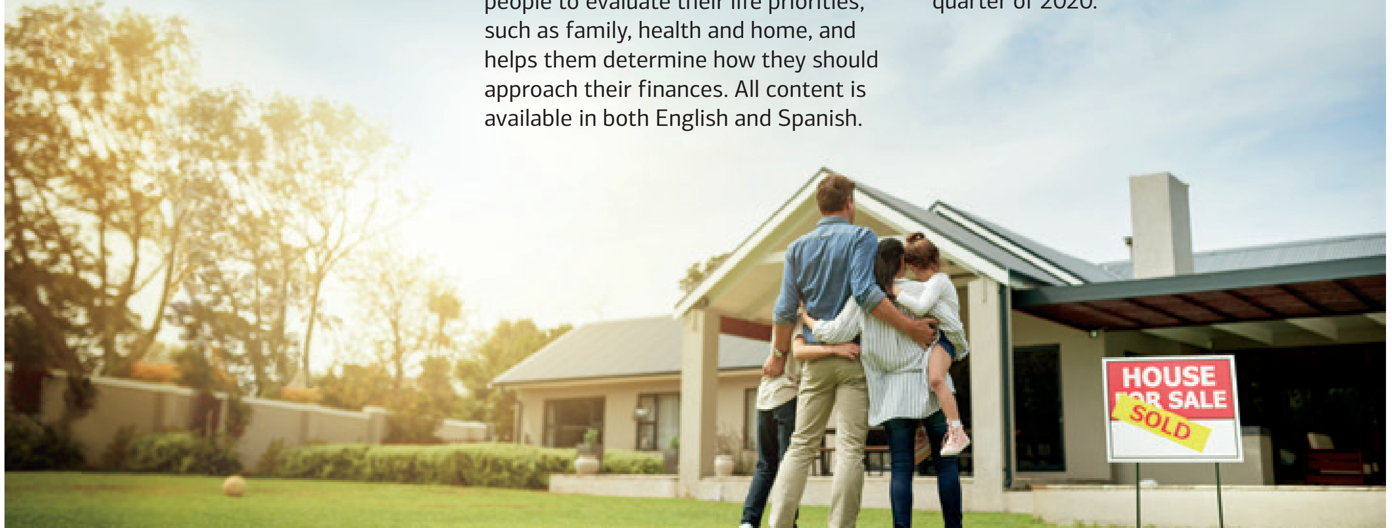
Consumers have accessed this free platform over 2.7 billion times. And it has had an impact on the habits of those who use it: 1 in 4 users (1 in 3 LMI users) of Better Money Habits and the Spending & Budgeting content grew their savings by 20% or more.[2]

Additionally, we've trained over 4,000 teammates who work in approximately 700 community financial centers on how to help consumers build their financial skills and pursue their goals, delivering quarterly educational workshops in English and Spanish.

Employment and business opportunities

We also are focused on helping people who live in our communities find meaningful employment. Externally — through our Supplier Diversity Program — we spend $2 billion each year with diverse-, veteran- and women-owned businesses. In 2018, we committed to hiring and training 10,000 teammates in LMI neighborhoods within five years. We are well ahead of that pace; our Consumer & Small Business team has hired more than 8,000 employees from these communities in just two years.

Those teammates benefit from our commitment to be a great place to work, which includes offering fair and competitive pay. We are an industry leader in establishing an internal minimum rate of pay above all mandated minimums for our U.S. hourly teammates, and have made regular increases over the past several years. Our minimum hourly wage for U.S. teammates is $20, as of the first quarter of 2020.



[1] Source: 2017 FDIC National Survey of Unbanked and Underbanked Households
[2] Refer to footnote 1 on page 39 for Better Money Habits research study information

Market presidents deliver the bank

Los Angeles Market President Raul Anaya

Bank of America operates locally in communities all across the United States. Having a strong local presence with deep connections in our communities drives performance in each of our lines of business. Leading the way in these communities are Bank of America market presidents who oversee integrated business teams to ensure we're delivering the full capabilities of our company to each client in every community, and lead our interactions with countless nonprofit partners.

This coast-to-coast network of more than 90 local executives — each of whom also serves in full-time roles as division leaders, client managers, financial advisors and more — connects the banking and investment resources offered through our eight lines of business to companies, families and individuals in each market, from the largest cities in the country to suburban and rural communities. They also lead our work in sharing our success by deploying Bank of America resources — including philanthropy and employee volunteerism — to address social and economic concerns and build strong communities.

One example is Los Angeles Market President Raul Anaya, who has spent the past eight years leading in one of the country's most vibrant and dynamic cities.

"As market president, I work with members of my team to bring the expertise and resources of our company to our clients, serve as a civic leader on community and social issues, and keep employees connected to reach their personal and career goals — all of which enhance the strength of our 100-plus year heritage here in Los Angeles," said Raul. "I'm incredibly proud."

Recently, to promote business integration, the market hosted its first-ever "Power of Inclusion Summit," an event designed to engage with business leaders on the strategic value of building a diverse and inclusive workforce. Existing and prospective clients were invited to attend and hear from leaders on how they are using inclusion as a competitive advantage, creating an ideal opportunity to build relationships and create momentum on an important issue.

In 2019, the L.A. team also helped address a critical issue in the city — housing and homelessness — partnering with groups such as the Central City Association and United Way to hold deep conversations about stemming the tide of homelessness through lending and investing in underserved areas and advocating for public-private solutions to complex housing issues. Coupled with the bank's community development lending and investing of over $315 million to help create more than 500 units of affordable housing in L.A., as well as local philanthropy of over $7 million to local groups, these efforts demonstrate that we're not only talking the talk, we're walking the walk to improve the economic mobility of all Angelenos.

To help make the bank a great place to work, the Los Angeles team established a number of ways to develop local talent, including creating mentoring programs, holding career events in partnership with groups such as the National Black MBA Association and offering training programs for those who serve on nonprofit boards.

These are just a few examples of the work market presidents are doing across the country to ensure Bank of America drives progress in every community where our clients and employees live and work.

Global Banking and Global Markets

Q&A with Tom Montag on deepening local client coverage and driving Responsible Growth

Q: Who does your business serve, and what's your vision for delivering for those clients?
Tom: Our Global Banking businesses serve companies of varying sizes. In Business Banking, we work with clients with more than $5 million in revenue; our Global Commercial Banking clients are mid-sized companies with revenues of $50 million to $2–$3 billion; and through Global Corporate & Investment Banking, we serve the largest companies and corporations in the world. Our Global Markets businesses serve institutional investors with sales and trading services, liquidity, hedging strategies and ideas and insights they draw from our top-ranked Global Research platform.

Our strategy is straightforward: deliver the full benefits of our company to our clients. We do this by deepening relationships and connecting our clients with the capabilities and solutions they need to drive their businesses forward. Every relationship and every market matters. From a first credit card to a first line of credit, to raising capital or advising on the sale of a company, we support our clients as their needs and aspirations evolve.

Q: How are Global Banking and Global Markets evolving to serve clients?
Tom: This year, we are continuing to build our capabilities in Global Banking to create more opportunity for middle market clients, who increasingly are global in their perspective. We are hiring and assigning additional client relationship bankers to serve clients through our local market teams, so they live and work in the same communities as those clients. Being local with an unparalleled global platform is a strength that differentiates us.

Tom Montag, Chief Operating Officer of Bank of America and President of Global Banking and Global Markets

95%

We have relationships with 95% of the 2019 U.S. Fortune 1,000; and 77% of the 2019 Global Fortune 500

We are also expanding the types of unique solutions available to our clients, including the leading capabilities we have in environmental, social and governance (ESG) and sustainable finance. Through BofA Securities, we have led more green bond deals than anyone else and we continue to provide clients with options that help finance a more environmentally sound planet. Our Investment Bank showed tremendous momentum in 2019, with increased market share in key countries across the world where we operate, including our U.S. middle market clients with which we already hold primary core banking relationships.

In Global Markets, we recently realigned our business to cover clients more efficiently and are making strategic investments in technology and people to continue to innovate across every asset class.

Q: What makes Global Banking and Global Markets at Bank of America unique?

Tom: We serve our clients by delivering market-leading solutions across consumer banking, wealth management, commercial banking, corporate and investment banking, sales and trading, and research. No one can offer the range of services and capabilities at the level that Bank of America can. By building relationships, being in the local market and consistently bringing the full value of our company for our clients, we are delivering on our commitment to Responsible Growth.

Powerful CashPro® platform

Our mobile and digital capabilities extend beyond our retail client offerings. Our business clients also seek solutions to help them work faster and more efficiently. Our commitment to providing those solutions has earned the business of approximately 35,000 companies and institutions across 175 countries. Each year, we manage $72 trillion in payments, receivables and deposit transactions through CashPro®, our award-winning platform accessed by approximately 500,000 users.

Through ongoing digitization of processes and expansion of online, application-programming interfaces and mobile capabilities, including electronic signature, real-time payments and loan information, clients can now access the platform anytime, anywhere. Last summer, one of our business clients used our mobile app to send a $1.6 billion payment, the biggest transaction ever on our CashPro app. CashPro ranks first in the Mobile category of Greenwich Associates latest Digital Banking Benchmarking study.

Client feedback helps make all of our capabilities better. The CashPro Client Advisory Boards, made up of clients of all sizes, help ensure that we are delivering for our clients through our digital platform and deepening our relationships with them.

Addressing society's biggest challenges

Q&A with Vice Chairman Anne Finucane

The Sustainable Development Goals (SDGs) are the world's roadmap to a sustainable future. The SDGs give governments, the private sector, foundations, and others a framework to prioritize resources and policies toward goals we all share: prosperity, equality, human rights, and a sustainable, clean energy future. **Brian Moynihan** lays out in these pages the ways that the private sector can align business operating models with investors seeking to drive capital toward companies that are making progress on the SDGs.

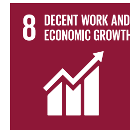
At Bank of America, sustainability is a central characteristic of our operating model. This includes our core financing and advisory capabilities for our clients, how we manage our own operations — our New York headquarters at One Bryant Park was the first Platinum certified LEED skyscraper in the world — our global workplace practices and our philanthropy. By aligning all of our capabilities, we create the scale needed to drive capital toward the world's most important priorities as defined in the SDGs: climate change, affordable housing, clean water and equal access to opportunities for prosperity.

Q: How are we driving progress on the United Nations Sustainable Development Goals?
Anne: To sharpen our focus on bringing even more business solutions to this work, we recently established a Sustainable Markets Committee, co-chaired by Chief Operating Officer **Tom Montag** and me, to accelerate our progress, identify new opportunities and build upon our work in sustainable finance in particular. While we already are making great progress — we are the largest underwriter of green bonds in the world for instance — the Sustainable Markets Committee will help us expand on that to identify even more opportunities to develop products, capabilities and services in support of our clients as we work together to help realize the achievement of the SDGs.

Q: How have we accelerated progress on specific SDGs?
Anne: Last year, Bank of America directed more than $50 billion in capital toward activities that support achievement of the SDGs. I'll highlight a few:

Affordable and Clean Energy (SDG7) and Clean Water and Sanitation (SDG6): From 2007 through the end of 2030, we will have financed more than $445 billion to low-carbon, sustainable business activities in support of energy efficiency, renewable energy and sustainable transportation, and in other areas including water conservation, land use and waste. In our own operations, we are carbon neutral as of 2020.

Sustainable Cities and Communities (SDG11): Between 2005 and 2019, we financed 202,800 affordable housing units. In 2019 alone, our Community Development Banking unit provided a record $4.88 billion in capital for affordable housing and community development, including financing more than 8,300 affordable housing units.



Good Health and Wellbeing (SDG3) and Decent Work and Economic Growth (SDG8): We are increasing our U.S. minimum wage to $20 per hour in 2020, and have strong and progressive health and wellness benefits. For example, for U.S. employees making less than $50,000, we reduced annual family coverage medical premiums by 50% in 2011, and have kept those premiums flat since 2012. We have paid family leave of 16 weeks for maternity, paternity and adoption, and generous bereavement benefits for those who have lost a loved one. And externally, since 2014, we have partnered with (RED)® to achieve an AIDS-free generation, pledging more than $35 million by 2025 to the Global Fund to Fight AIDS.

Gender Equality (SDG5): We support equal pay for equal work. At our company, compensation received by women on average is greater than 99% of that received by men, and compensation received by people of color on average is greater than 99% of non-people of color, as validated by third-party analysis. In addition to compensation, our ongoing work to invest in women as they make meaningful contributions within our company and in our communities includes our focus on being a great place to work for our female employees, making the financial lives of our female clients better, and advancing the economic empowerment of women around the world.

Zero Hunger (SDG2), Quality Education (SDG4) and Reduced Inequalities (SDG10): We invested nearly $250 million in 2019 in global philanthropic giving to advance economic mobility—with $2 billion in giving since 2009. For example, since 2015, across the globe we've invested nearly $50 million in support of hunger relief, and $243 million to advance skill building and jobs for young adults and those with barriers to employment, including addressing issues affecting social justice and racial and gender inequality.

These are just some of many examples of how we bring our full company and broader influence to address these 17 critical goals.

Q: How are you engaging with others externally to drive this work?

Anne: We drive global collaboration to address these major societal challenges by engaging with external stakeholders. **Brian Moynihan** discusses in his letter the work he is doing at the International Business Council of the World Economic Forum to develop standardized metrics that define sustainable business practices. We also are working with the World Bank and Stanford University to develop financial vehicles that will deploy greater capital to support the SDGs and close the funding gap. We are working with the Vatican, the United Nations and the Prince of Wales to help harness the power of the capitalist system to be able to address society's needs. In the U.S., our **National Community Advisory Council** (NCAC) consists of senior leaders from social justice, consumer advocacy, community development, environmental, research and advocacy organizations who provide external perspectives, guidance and feedback on our business policies and practices. Our work in these areas is recognized by others: In 2019, we were named to the CDP A list for leadership in addressing climate change. This was our ninth year as a CDP-recognized leader. And for the sixth straight year, we were recognized for ESG leadership on the Dow Jones Sustainability Index (DJSI) World Index.

In addition to the work I'm describing here, please see the following pages for additional examples of the progress we are making.

> *"We are addressing some of society's greatest challenges by helping align the various sources of capital—from the business community, the public sector, and philanthropy—with all of Bank of America's financial capabilities and talent, calling on the expertise of our teams and the passion of our employees around the globe."*

A world of ESG innovation

We have achieved carbon neutrality in our own operations* one year ahead of schedule.

How did we get there? We reduced Scope 1 and 2 emissions in our facilities by more than 52% since 2010 and met our goal to purchase 100% of our electricity from renewable sources. We installed on-site solar at our facilities, completed multiple long-term renewable agreements to add new wind and solar electricity to the grid, and purchased Renewable Energy Credits.

To compensate for unavoidable emissions, we purchased carbon offsets by supporting four projects in impoverished areas around the globe, which help to preserve biodiversity and drive reforestation, while furthering local economic mobility.

In Indonesia, we supported peatland protection through Cool Effect. The project is restoring 157,000 hectares of damaged vital peatland. It also directly supports 34 communities, has 100% Indonesian staff and has provided 948 micro-loans for sustainable small business development.

In the Mississippi River Valley, we supported an Arbor Day tree planting as part of the largest reforestation program in North America — already over 120,000 acres have been reforested with more than 500 landowners participating and 42 million trees planted. This ultimately helps communities in some of the poorest counties in the U.S. to build resiliency against climate change and flooding.

In Peru, we supported a conservation program that helps protect the Andes and Amazon forests by establishing sustainable livelihoods for communities living around the Cordillera Azul National Park. The project created 624 jobs, 30% of which are held by women. It also returned $1.43 million to the local economy through the production of fair trade, organic cocoa, coffee and honey.

Finally, in Kenya and Uganda, we supported an endeavor that empowers small farmer communities to learn to plant and maintain trees, for which they receive cash stipends. They also receive health training on HIV/AIDS, malaria, typhoid and tuberculosis, as well as vocational education and leadership training.

We have achieved carbon neutrality in our own operations* one year ahead of schedule.

*pending third-party validation

Investing to improve the environment

Our financial commitment to improving the environment helps inform our global business strategy, including how we work with partners, support our employees, make our operations more sustainable, manage issues and govern our activities. These efforts are critical to our efforts to achieve U.N. Sustainable Development Goals focused on Clean Water and Sanitation (SDG6), Affordable and Clean Energy (SDG7) and more.

Our $125 billion commitment to mobilize capital to low-carbon, sustainable business activities was achieved in 2019, six years ahead of schedule, and we're not done yet. In 2019, we announced an additional $300 billion environmental business commitment, which we will meet by 2030, in support of energy efficiency, renewable energy and sustainable transportation, as well as important areas like water conservation, land use and waste.

We are the first U.S. financial institution to issue five corporate green bonds, which raised a total of $6.35 billion for renewable energy projects since 2013. And we have been a leader in green bond underwriting globally. BofA Securities has underwritten more than $49 billion on behalf of over 100 clients, supporting more than 288 deals and providing critical funding to environmental projects since 2007. We have also been the top investor in tax equity projects in the U.S. since 2015. Our current portfolio holds approximately $9.4 billion of renewable energy tax equity projects supporting wind and solar facilities.

We have achieved carbon neutrality in our own operations* one year ahead of schedule.

$158B

Deployed to low-carbon sustainable business activities

$49B

Green bonds underwritten since 2007 supporting environmental projects

$9.4B

Renewable energy tax equity projects for wind and solar facilities

*pending third-party validation

Driving economic mobility: one community's story

$1.5B	Our investment across 255 Community Development Financial Institutions to finance economic development, small businesses, affordable housing and community facilities and services
$2B	Philanthropic investments since 2009 to drive economic mobility and social progress in the communities we serve
$5B	Part of our affordable home ownership initiative for low- and moderate-income homebuyers and communities across the U.S.
2M	Volunteer hours by Bank of America employees in their local communities in 2019

Economic inequality is one of the fundamental challenges of our time. Bank of America has a responsibility to use our resources — including capital, ideas, and the talent and passion of our team members — to help create solutions to this challenge.

Our approach starts with a basic fact: Economic opportunity often depends on where a person lives. Some neighborhoods offer a path to a quality education, a decent home, a good job and financial security; but others do not.

In our headquarters city, Charlotte, North Carolina, we joined with other business leaders, government agencies and nonprofit organizations to address this disparity and improve economic mobility for our fellow citizens. Local corporations and academic institutions came together in 2015 to form the Charlotte Executive Leadership Council (CELC) to tackle structural obstacles to economic opportunity. Bank of America's CEO, Brian Moynihan, has chaired the CELC since 2018. Following the detailed recommendations of a local task force to address the roots of economic inequality, we are working through the CELC to make an impact in education, workforce development, affordable housing, community engagement and economic development.

Investing in education, jobs and housing

Because early education is vital to economic mobility, extending free, public pre-K to all 4-year-olds in Charlotte was a top priority. We contributed to the initial studies and helped fund scholarships and related expenses to expand the pre-K teacher workforce, committing $1 million of $6 million raised from the private sector over five years. This private sector investment leveraged $229 million in Mecklenburg County funding for pre-K and childcare subsidies over the same period of time.

To create pathways to job opportunities, we support youth apprenticeship and other workforce development initiatives. Participating CELC members, including Bank of America, expect to hire 1,000 employees through local training programs and offer 1,500 work-based learning experiences for K-12 students in the coming year.

We have partnered with other financial institutions to commit more than $135 million to affordable housing — the largest private sector investment in affordable housing in Charlotte s history. To help the project work financially, our commitment includes below-market loans, a donation of land, an investment in the Charlotte Housing Opportunity Investment Fund, and economic mobility grants and programs. In total, public and private partners in Charlotte have committed over $270 million to affordable housing.

What's happening in Charlotte is not an isolated effort. Many of the initiatives first used in Charlotte are now being piloted in other Bank of America markets, with a goal of creating greater economic mobility for all our communities — and the people who live and work in them.

Diversity at work and in our communities

Diversity — in thought, style, age, sexual orientation, gender identity, race, ethnicity, culture and experience — makes us stronger and is essential to our ability to serve our clients, fulfill our purpose and drive Responsible Growth. We have a longstanding commitment to invest in diverse communities, including supporting strong diversity in representation across our company, reflecting the clients and communities we serve. We're proud of the progress we've made, particularly our efforts in support of Black/African American and Hispanic-Latino communities, which we feature below. A broad discussion of our diversity commitment, how we execute on it and our results are discussed in detail throughout our 2019 Human Capital Report, which is available on our Investor Relations website.

We are sharply focused on building a diverse workforce, which is currently 13% Black/African American and 18% Hispanic-Latino, exceeding EEOC financial services and Department of Labor benchmarks; and last year, the number of executive and senior-level officials and managers drawn from these populations increased more than 14%.

In our efforts to further increase our diverse representation, we're partnering with more than 200 external organizations to identify diverse talent. And, we have networking groups to provide professional development, mentoring and leadership opportunities. Employee Networks such as our Hispanic-Latino Organization for Leadership & Advancement (HOLA) and Black Professional Group (BPG) have more than 14,500 memberships each.

We're committed to making the financial lives of our clients better. Approximately 1 in every 3 checking accounts opened at Bank of America is by Hispanic-Latino clients, and 15% of checking accounts opened at Bank of America are by Black/African American clients. We deliver a full spectrum of products and services for these clients, whether they are looking to invest or just starting their financial journey. We offer Spanish-language capabilities across multiple products and services including our free Better Money Habits® website, which helps people build their financial know-how. In 2020, we celebrate 30 years of our corporate Supplier Diversity & Development Program, which supports minority-, women- and other diverse-owned suppliers, spending nearly $2 billion with diverse suppliers each year.

Partnerships and programs are helping to drive our focus on economic mobility. In 2019 alone, we invested more than $55 million to advance issues of economic mobility and social justice affecting Blacks/African Americans and Hispanic-Latino individuals. We partner with change-making organizations like the NAACP, National Urban League and UnidosUS, all of

whom serve on our National Community Advisory Council, a group that helps inform our approach to serving our clients and communities. We use our voice to advocate for progress on societal challenges that disproportionately affect diverse communities. For example, we signed the CEO Action Pledge for Diversity & Inclusion, continuing our leadership role in making our sector more diverse and inclusive, expanding unconscious bias education and sharing best practices. In 2019, we became the first financial services organization to sign the Hispanic Promise, pledging our commitment to hire, promote, retain and celebrate Hispanic-Latino individuals in the workplace. And last year, we renewed our commitment to Unlocked Futures, which invests in social entrepreneurs who have been impacted by the criminal justice system.

Helping break barriers to economic mobility and drive progress on social issues for diverse populations is important to our employees, our clients, our investors and our communities, and we will continue driving this work.

Employee Networks

Our 11 Employee Networks, which include more than 300 chapters and 160,000 memberships worldwide, help teammates develop leadership skills, build ties with local communities and advance diversity recruitment.

Our Employee Networks include:

- Asian Leadership Network
- Black Professional Group
- Disability Advocacy Network
- Hispanic/Latino Organization for Leadership and Advancement (HOLA)
- Inter-Generational Employee Network
- Leadership, Education, Advocacy and Development (LEAD) for Women
- Lesbian, Gay, Bisexual and Transgender (LGBT+) Pride
- Military Support and Assistance Group
- Multicultural Leadership Network
- Native American Professional Network
- Parents and Caregivers Network

200+

Number of external organizations we're partnering with to identify diverse talent

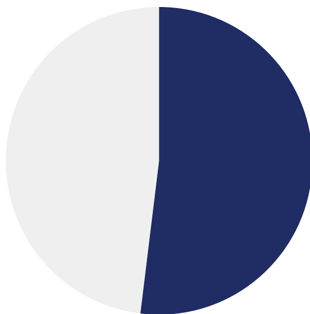
$55M+

Amount invested in 2019 to advance issues of economic mobility and social justice affecting Blacks/ African Americans and Hispanic-Latino individuals

160,000+

Memberships in our 11 Employee Networks

Our diversity makes us stronger, and the value we deliver as a company is strengthened when we bring broad perspectives together to meet the needs of our diverse stakeholders.

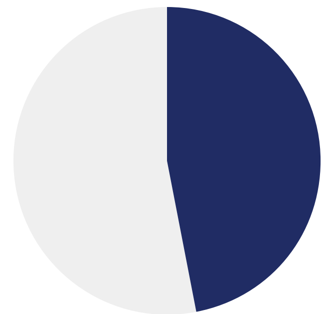


over 50%

of our management team are women or people of color

over 50%

of our global workforce are women



over 45%

of our U.S.-based workforce are people of color

Creating opportunities through employee development

"A key element of sustainable growth is being a great place to work for our more than 200,000 employees. That means creating opportunities for our teammates to grow and develop so they can deliver great service to our clients while having a rewarding career at our company."

Sheri Bronstein, *Chief Human Resources Officer*

CORDELL JACKSON *(Right)*

Cordell Jackson started in the Consumer Banking call center and has grown professionally over the years thanks to his talent, support from managers and teammates, and our career resources. As part of his career progression, Cordell recently transitioned roles, from a risk analysis senior manager to a strategic consumer product analyst. "If you aren't learning, you aren't growing," Cordell explains, and the bank has been with him every step of the way. To help Cordell further develop his skills, he was nominated to participate in our Diverse Leader Sponsorship Program, a highly selective 10-month development program that pairs candidates with more senior executive sponsors who will help them build skills, gain exposure and broaden their network. In addition, our tuition reimbursement program helped Cordell finance his master's certificate. Through our online Learning Hub platform, he can access an extensive library of career development resources, including white papers, videos and articles from industry experts. Now, Cordell continues to develop his skills, grow his professional network and mentor other employees as co-chair of the bank's Black Professional Group chapter in Delaware.

JUDY RETANA *(Below)*

Judy Retana started her career as an intern with Bank of America through long-time bank partner Year Up® before becoming a full-time teammate through our Pathways program. Through Pathways, we work with nonprofit partners like Year Up to provide skills training and career pathways to Consumer & Small Business teammates from low- and moderate-income communities. "Year Up provided me with the tools to help me create a professional brand to advance my corporate career. Its mission is to close the opportunity divide between those who have a college education and work experience, and those who don't but who have high potential," Judy explained. Today she's thriving in her role as a Merrill ongoing support specialist. "Our business is constantly changing, with a lot of new opportunities. There are many talented people who deserve the same chance in life I've had. Programs like Year Up and Pathways enable people to start their careers."

DANIEL BURTON-MORGAN *(Above)*

London-based Daniel Burton-Morgan was in his final year at university when he was offered his first full-time job with our company as a UK mergers and acquisitions analyst. Fourteen years later, he's a managing director in Global Corporate & Investment Banking with deep experience serving our global clients across Europe, the Middle East and Africa. According to Daniel, the opportunity to move into new roles across business units and in different locations is one of many reasons that Bank of America is such a great place to work and build a long-term career. Another is our commitment to developing employees. Daniel is an alumnus of our Emerging Leaders Program, which brings together leaders to enhance their effectiveness. "It was a fantastic opportunity to meet teammates across the company and exchange ideas around growing our business," he said. "Professional development is critically important because it keeps work interesting and rewarding," Daniel added. "Even more, clients expect us to grow with them, and they want financial advice and solutions delivered through a global lens."

Supporting teammates in moments that matter

Part of being a great place to work is supporting our employees in the moments that matter most. This includes helping our teammates navigate significant life events — connecting them to internal and external resources, benefits, counseling and other support options. In 2014, we established our Life Event Services (LES) group — an internal and highly specialized team that has provided more than 100,000 team members with empathetic and personalized support for needs related to terminal illness, taking a leave of absence, the death of a loved one, domestic violence, medical accommodations, transgender and gender identity, retirement and military service.

Additionally, when disasters occur, LES provides support for employees who are affected by an event, such as a natural disaster, violence or house fire. This can include providing paid time off to handle the impacts of the event, temporary housing and referrals to community organizations, or arranging emotional support for the teammate and family members.

Chief Human Resources Officer Sheri Bronstein said, "Being a great place to work means having a culture of caring. By supporting our teammates through difficult moments, we help them to be their best both at work and at home so they can deliver for their families, our clients and our communities."

LES was there for Alison Harding, an employee in Global Technology & Operations, when a hurricane threatened her home in Charleston, South Carolina. The area was under mandatory evacuation; however, Alison's family did not have a vehicle large enough to accommodate her special-needs child, his medical equipment, nurse and the family. LES took action to help and within 20 minutes, secured a large vehicle to meet their needs enabling the family to safely evacuate. "I felt instant relief, followed by how proud I was to work for a company that helped me in a time of need," said Alison. "With a special-needs child, we have to consider and worry about so many things and this obstacle was removed so we could focus on caring for our family."

100,000+

Employees supported during the moments they and their families needed it the most

Partnering to end AIDS

Since 2014, we have partnered with (RED)®
to achieve an AIDS-free generation. As of December 31, 2019, our partnership has generated nearly $19 million in contributions to the Global Fund to Fight AIDS. In October 2019, we extended our commitment to pledge more than $35 million by 2025.

In partnership with brands worldwide, (RED) raises money and awareness in the fight against AIDS. Its partners contribute to Global Fund grants that provide treatment, testing and preventative care and counseling services, with a focus on ending mother-to-child HIV transmission in eight sub-Saharan African countries.

Currently, 38 million people are living with HIV globally, with 26 million in sub-Saharan Africa. Thanks in large part to (RED) and the Global Fund, more than 24.5 million people now have access to life-saving treatment. Additionally, AIDS-related illnesses have decreased by more than half since peaking in 2004.

Our work with (RED) is an example of how we are partnering to help address local, national and global social priorities — including Good Health and Wellbeing (SDG3) — to deliver Responsible Growth. By furthering our commitment and working together, we will help end AIDS.

Courageous conversations

Our commitment to being a great place to work is rooted in celebrating diversity and inclusion (D&I). Women make up 50% of our workforce, and over 45% of our U.S. workforce are people of color. Over the past few years, we have developed a new forum for bringing us all together, called courageous conversations. These candid dialogues, focused on topics like race and gender equality, social justice, emotional wellness and domestic violence, engage teammates and drive inclusivity. More than 60,000 teammates have participated in these sessions.

We have incorporated courageous conversations into our broad D&I learning, including our “Let’s Get Real” program, a quarterly series sponsored by the Global Diversity & Inclusion Council.

Due to the positive feedback we received about these internal discussions, we began hosting conversations with our clients and communities, including a recent Boston-based session on substance misuse disorders and ways to support those in recovery.

60,000+

Teammates have participated in courageous conversations

Total rewards

We listen and learn from our teammates about what matters most as we continue to deliver on our commitment to be a great place to work. Our teammates emphasize that they want the opportunity to have rewarding, long-term careers; to be supported in physical, emotional and financial wellness; and to make a difference in our local communities.

To support our employees with their personal and professional goals, we pay our teammates competitively and provide broad and diverse benefits to meet their needs both today and in the future.

In the first quarter of 2020, we are increasing our minimum hourly wage for U.S. teammates to $20. As a result of this change, our yearly minimum rate of pay for a full time employee will increase to more than $41,000. In addition to this yearly wage, we provide a variety of health care and wellness benefits, which are significant, additional components of the total rewards that all employees receive.

As an example, an employee making just over our minimum hourly wage with a base salary of $45,572 who also receives company contributions for retirement, health and insurance coverage and childcare, would have total annual pay and benefits of over $77,000 per year. And this number could increase further depending on the other benefits an employee may choose to use — such as tuition assistance, free confidential counseling through our Employee Assistance Program, company-provided matching gifts for charitable donations and more.

Each year, eligible U.S. employees have the opportunity to review a summary of what they earned, what they saved and how much the company contributed to their benefits for the prior year — all part of our approach to total rewards and investing in our teammates.

Assuming an employee with a **base salary** of **$45,572***

Company contributions to **family health and insurance coverage** would be **$25,133**

Company contributions to **401(k)** would be **$3,190**

Company-provided **child care reimbursements** would be **$3,595**

Company contributions would bring total **annual pay and benefits** to **$77,490**

*Example is based on employee with a base salary of $45,572 and benefits profile, living in one of our markets in the U.S., who is enrolled in a representative set of Bank of America employee benefit programs (including 401(k) plan, medical, dental, disability, life insurance, accidental death & dismemberment insurance, and child care reimbursement). For the 401(k), it assumes the employee has at least 1 year of service, and is receiving 2% Annual Company Contribution and 5% Company Match (based on a contribution rate of at least 5%).

Funding the power to dream

In 2019, we asked employees from across the globe "What would you like the power to do?" and how they would put a financial grant to work in their communities. We responded with nearly $1 million in funding for 42 employee ideas that focused on economic mobility, the environment, and arts and culture. These ideas were selected to receive a $50,000 or $10,000 grant and support from within the bank, in partnership with an eligible local nonprofit.

Among those selected was Ashton Ngwena, an employee in Investment Banking. Ashton knows firsthand that a quality education is not affordable or accessible for everyone. His journey from a small farming village in Zimbabwe inspired his desire to assist other children who are in a similar position. His idea will help build a community school for Education Matters Africa in Zimbabwe. "Getting accepted into Education Matters Africa was a key turning point in my life. I am grateful to Bank of America for helping this organization to further their impact through this opportunity for the students to learn, to hope and to dream of a brighter future for their communities," said Ashton.

Similarly, Merrill Lynch Wealth Management Advisor Sue Harmon was inspired to help young adults with developmental disabilities achieve their dreams by ensuring they have transportation to get to work. She is tackling this common problem by partnering with The Arc of Greater Williamsburg in Virginia to launch Wheels4Work, a transportation and employment project.

This program is just one way we are building on our progress to support our teammates, their families and the communities where we work and live.

Photo courtesy of Education Matters Africa

2019 Human Capital Management Report

We are committed to being a great place to work and investing in the people who serve our clients and live and work in our communities. In 2019, we published our first human capital management report detailing all we do to support our more than 200,000 teammates and their families. The importance our stakeholders place on transparency and how we engage our employees on key issues — such as talent management, employee engagement and diversity — is an increasingly common theme. To provide additional clarity on our company's actions, the 2019 Human Capital Management Report — available on our Investor Relations website — illustrates how we promote a diverse and inclusive workforce, recognize and reward performance, attract and develop talent, and support our teammates' physical, emotional and financial wellness. Going forward, we will continue to report on these items and the progress we're making as part of our focus on making this the best place for our employees to work.

2019 ESG highlights

At Bank of America, we are driving Responsible Growth with a strong focus on environmental, social and governance (ESG) leadership. This helps us to serve clients, deliver attractive returns for our shareholders and address some of society's greatest challenges.

Sustainable finance

Each year, we mobilize, conservatively, more than **$50 billion** that impacts a key subset of the SDGs.

Environmental business commitment

Our Environmental Business Initiative will direct an additional **$300 billion** to low-carbon, sustainable business activities over the next **10 years**. Since 2007 when it was launched, we have already deployed **$158 billion** to these efforts across the globe.

Tax equity for renewables

We have been the top tax equity investor in the U.S. since 2015. Our portfolio at the end of 2019 was approximately **$9.4 billion** of Tax Equity renewable energy investment.

Carbon neutrality

We achieved carbon neutrality by reducing Scope 1 and 2 emissions from our facilities, purchasing **100% renewable** electricity and buying carbon offsets for our remaining unavoidable emissions.

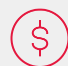
Green bonds

We have been a leader in green bond underwriting globally since 2007. BofA Securities has underwritten more than **$49 billion** on behalf of 100+ clients, supporting more than **288 deals** and providing critical funding to environmental projects, since 2007.

We are the first U.S. financial institution to issue five corporate green bonds. These five corporate green bonds raised a total of **$6.35 billion** for renewable energy projects since 2013.

Climate risk and ESG disclosure

We understand climate change presents risks to the business community, and it is important for companies to articulate how these risks are being managed. We will be issuing our Task Force on Climate-related Financial Disclosures (TCFD) report in 2020 to ensure our shareholders, clients and communities are aware of the financial risks of climate change to our business and how we are managing those risks. We also continue to focus on transparency and driving data with organizations like the World Economic Forum, Sustainability Accounting Standards Board, the Global Reporting Initiative and others, and how best to align those metrics to the U.N. Sustainable Development Goals.



Blended Finance Catalyst Pool

In 2018, we launched our Blended Finance Catalyst Pool to mobilize additional private capital to help address the U.N. Sustainable Development Goals. This financing initiative provides **$60 million** of capital for Affordable and Clean Energy (SDG7), Sustainable Cities and Communities (SDG11), Clean Water and Sanitation (SDG6), and Climate Action (SDG13), among others.

Affordable homeownership

In April 2019, we announced our new **$5 billion** Bank of America Community Homeownership Commitment™ to benefit low- and moderate-income (LMI) homebuyers and communities across the country over the next five years.

Community Development Banking

Bank of America Community Development Banking (CDB) provided a record **$4.88 billion** in loans, tax credit equity investments and other real estate development solutions.

CDB deployed **$3.1 billion** in debt commitments and **$1.78 billion** in investments to help build strong, sustainable communities by financing affordable housing, charter schools and economic development across the country.

Between 2005 and 2019, Bank of America financed **202,800** affordable housing units.

Community Development Financial Institutions (CDFI) lending

We originated more than **$325 million** in loans as part of our more than **$1.5 billion** investment in 255 CDFIs to finance affordable housing, economic development projects, small businesses, health care centers, charter schools, and other community facilities and services.

Bank of America Art Conservation Project

Since 2010, the Bank of America Art Conservation Project has provided grants to fund **170 conservation projects** in **33 countries** to conserve paintings, sculptures, and art and cultural treasures that are important to cultural heritage. We are a leader in helping the arts flourish across the globe, supporting more than **2,000 nonprofit cultural institutions** each year.

Small business lending

We provide advice, tools, solutions and dedicated support to meet the unique needs of our **12 million small business owners**. We are a top lender in the Small Business Administration's (SBA's) 504 and 7(a) programs, and according to the FDIC, we are the top small business lender with **$37.6 billion** total outstanding small business loan balances as of third quarter 2019. More than half (57%) of all small business loans booked in 2019 were LMI loans for a total amount of **$6.3 billion**.

ESG client balances

We have **$25.11 billion** in assets in our wealth management business with a clearly defined ESG investment approach as of Dec. 31, 2019.

Women's economic empowerment

In 2019, we doubled our investment in the Tory Burch Foundation Capital Program, committing **$100 million** in capital to connect women small business owners to affordable loans. Since the program's launch five years ago, more than 3,200 women entrepreneurs have received **$54 million** in loans through CDFIs to help them grow and refine their businesses.

After launching the Bank of America Institute for Women's Entrepreneurship at Cornell in 2018, we announced in 2019 that we are doubling our commitment and will provide access for 20,000 women entrepreneurs to participate in the only online Ivy League, certificate program for women business owners in the world. Representing over 65 countries including Bangladesh, Egypt, Ghana, Uruguay and the United States, more than 15,700 women are currently enrolled.

Philanthropic giving

We have delivered **$2 billion** in philanthropic investments since 2009. In 2019, we delivered approximately **$250 million** in philanthropic investments to drive economic mobility and social progress in the communities we serve.

Employee giving and volunteering

Last year, employees volunteered **2 million hours** and directed **$77 million** to communities through individual giving and the bank's matching gifts program.

Pathways

We are helping individuals of all socioeconomic backgrounds find meaningful employment, including through Pathways, our community hiring and development program that provides entry-level jobs and career training in Consumer & Small Business for individuals from LMI neighborhoods. To date, the bank has hired **more than 8,000 employees** from these communities, putting the company at over 80% of its five-year **10,000 hiring goal** in just two years.

Better Money Habits®

Since launching the Better Money Habits program, we've reached consumers over **2.7 billion times.**

1 in 4 users of Better Money Habits content and tools grew their savings by 20% or more.[1]

In 2019, visitors to Better Money Habits home loans content were **37 times more** likely to obtain a home loan within 30 days.[1]

71% of active Better Money Habits users have used the Spending & Budgeting tool.

[1] Represents Bank of America Consumer households for entire 12-months under study who used the Saving and Budgeting Tool during March 2017. Analysis based on average balances for the 6 months prior to March 2017 ("pre" period) and the 6 months after March 2017 ("post" period).

Bank of America Corporation — Financial highlights

Bank of America Corporation (NYSE: BAC) is headquartered in Charlotte, North Carolina. As of December 31, 2019, we operated across the United States, its territories 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.

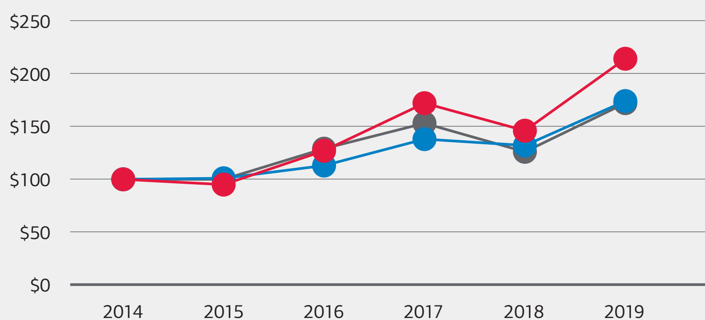
Financial highlights ($ in millions, except per share information)

For the year	2019	2018	2017
Revenue, net of interest expense	$ 91,244	$ 91,020	$ 87,126
Net income	27,430	28,147	18,232
Earnings per common share	2.77	2.64	1.63
Diluted earnings per common share	2.75	2.61	1.56
Dividends paid per common share	0.66	0.54	0.39
Return on average assets	1.14%	1.21%	0.80%
Return on average tangible common shareholders' equity[1]	14.86	15.55	9.41
Efficiency ratio	60.17	58.40	62.57
Average diluted common shares issued and outstanding	9,443	10,237	10,778

At year-end	2019	2018	2017
Total loans and leases	$ 983,426	$ 946,895	$ 936,749
Total assets	2,434,079	2,354,507	2,281,234
Total deposits	1,434,803	1,381,476	1,309,545
Total shareholders' equity	264,810	265,325	267,146
Book value per common share	27.32	25.13	23.80
Tangible book value per common share[1]	19.41	17.91	16.96
Market price per common share	35.22	24.64	29.52
Common shares issued and outstanding	8,836	9,669	10,287
Tangible common equity ratio[1]	7.3	7.6	7.9

[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 48 and Non-GAAP Reconciliations on page 101 of the 2019 Financial Review section.

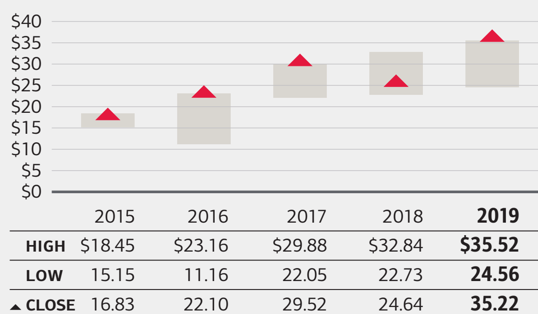
Total Cumulative Shareholder Return[2]



December 31	2014	2015	2016	2017	2018	2019
Bank of America Corporation	$100	$95	$127	$172	$146	$214
S&P 500	100	101	113	138	132	174
KBW Bank Sector Index	100	100	129	153	126	172

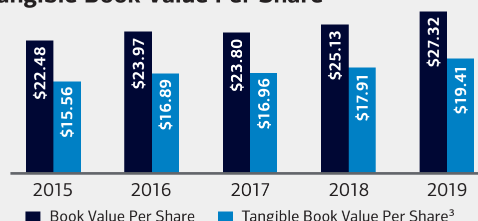
[2] This graph compares the yearly change in the Corporation's total cumulative shareholder return on its common stock with (i) the Standard & Poor's 500 Index and (ii) the KBW Bank Index for the years ended December 31, 2014 through 2019. The graph assumes an initial investment of $100 at the end of 2014 and the reinvestment of all dividends during the years indicated.

BAC Five-Year Stock Performance



	2015	2016	2017	2018	2019
HIGH	$18.45	$23.16	$29.88	$32.84	$35.52
LOW	15.15	11.16	22.05	22.73	24.56
▲ CLOSE	16.83	22.10	29.52	24.64	35.22

Book Value Per Share/ Tangible Book Value Per Share



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

2019 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 2019 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; the possibility that the Corporation's future liabilities may be in excess of its recorded liability and estimated range of possible loss for litigation, regulatory and representations and warranties exposures; the possibility that the Corporation could face increased servicing, fraud, indemnity, contribution or other claims from one or more counterparties, including trustees, purchasers of loans, underwriters, issuers, monolines, private-label and other investors, or other parties involved in securitizations; 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 and tensions, including tariffs, and potential geopolitical instability; the impact of the interest rate environment on the Corporation's business, financial condition and results of operations; 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, provision for credit losses, net charge-offs, effective tax rate, 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 or borrowing costs; estimates of the fair value and other accounting values, subject to impairment assessments, of certain of the Corporation's assets and liabilities; the estimated or actual impact of changes in accounting standards or assumptions in applying those standards; 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 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 or disruption 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 or campaigns; the impact on the Corporation's business, financial condition and results of operations from the United Kingdom's exit from the European Union; the impact of any future federal government shutdown and uncertainty regarding the federal government's debt limit; the impact of natural disasters, the emergence of widespread health emergencies or pandemics, military conflict, terrorism or other geopolitical events; and other 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," "we," "us" and "our" 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, 2019, the Corporation had $2.4 trillion in assets and a headcount of approximately 208,000 employees.

As of December 31, 2019, we served clients through operations across the U.S., its territories and approximately 35 countries. Our retail banking footprint covers approximately 90 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 16,800 ATMs, and leading digital banking platforms (www.bankofamerica.com) with more than 38 million active users, including over 29 million active mobile users. We offer industry-leading support to approximately

three million small business owners. Our wealth management businesses, with client balances of $3.0 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 2019, we repurchased $28.1 billion of common stock pursuant to the Corporation's Board of Directors' (the Board) repurchase authorizations. For more information, see Capital Management on page 66.

Merchant Services Joint Venture

A significant portion of our merchant processing activity is performed by a joint venture, formed in 2009, in which we own a 49 percent ownership interest. The joint venture is accounted for as an equity method investment. As previously disclosed in the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019, we gave notice on July 29, 2019 to the joint venture partner of the termination of the joint venture upon the conclusion of its current term, after which we expect to pursue our own merchant services strategy. In addition, the Corporation and the joint venture partner have an agreement to provide uninterrupted delivery of products and services to the joint venture merchants through at least June 2023. As a result of the above actions, we incurred a non-cash, pretax impairment charge of $2.1 billion included in other general operating expense in the three months ended September 30, 2019. As stated above, the Corporation expects to pursue its own merchant services strategy, which is expected to begin in the third quarter of 2020. Under this strategy, we will begin to record the revenues and expenses from those operations in the Consolidated Statement of Income instead of recognizing our proportionate share of the joint venture's income under the equity method. For more information, see *Note 13 – Commitments and Contingencies* to the Consolidated Financial Statements.

U.K. Exit from the EU

On January 31, 2020, the U.K. formally exited the European Union (EU). Upon exit, a transition period began during which time the U.K. and the EU expect to negotiate a trade agreement and other terms associated with their future relationship. The transition period is scheduled to end on December 31, 2020.

We conduct business in Europe, the Middle East and Africa primarily through our subsidiaries in the U.K., Ireland and France. For information on the changes we have implemented to enable us to continue to operate in the region, including establishing a bank and broker-dealer in the EU, see the Corporation's Quarterly Report on Form 10-Q for the quarter ended March 31, 2019. While we have taken measures to minimize operational disruption and prepare for various potential outcomes of the U.K.'s withdrawal from the EU, the preparedness of our counterparties and the relevant financial markets infrastructure remain outside our control. The global economic impact of the U.K.'s withdrawal from the EU remains uncertain and could result in regional and global financial market disruptions. We continue to assess potential risks, including operational, regulatory and legal risks.

LIBOR and Other Benchmark Rates

Following the 2017 announcement by the U.K.'s Financial Conduct Authority (FCA) that it will no longer persuade or require participating banks to submit rates for the London Interbank Offered Rate (LIBOR) after 2021, central banks and regulators around the world have commissioned working groups to find suitable replacements for Interbank Offered Rates (IBOR), including LIBOR, and other benchmark rates and to implement financial benchmark reforms more generally. The future discontinuance of IBORs is a complex process that has resulted in significant uncertainty regarding the transition to suitable alternative reference rates (ARRs) and could cause disruptions in a variety of global financial markets, as well as adversely impact our business, operations and financial results.

IBORs, including LIBOR, are used in many of the Corporation's products and contracts, including mortgages, consumer, commercial and corporate loans, derivatives, floating-rate notes and other adjustable-rate products and financial instruments. The aggregate notional amount of these products and contracts is material to our business. As previously disclosed, to facilitate an orderly transition from IBORs and other benchmark rates to ARRs, the Corporation has established an enterprise-wide initiative led by senior management. As part of this initiative, the Corporation continues to identify, assess and monitor risks associated with the expected discontinuation or unavailability of LIBOR and other benchmarks and evaluate and address documentation and contractual mechanics of outstanding IBOR-based products and contracts that mature after 2021 and new and potential future ARR-based products and contracts to achieve operational readiness. Additionally, the Corporation is continuing to evaluate potential regulatory, tax and accounting impacts of the transition, including guidance published and/or proposed by the Internal Revenue Service and Financial Accounting Standards Board, engage impacted clients in connection with the transition to ARRs and work actively with global regulators, industry working groups and trade associations to develop strategies for an effective transition to ARRs.

The Corporation is also modifying its operational models, systems, procedures and internal infrastructure to transition to ARRs. In 2019, the Corporation launched capabilities to support issuance and trading in products indexed to the new Secured Overnight Financing Rate (SOFR), which is the alternative benchmark rate to U.S. dollar LIBOR recommended by the Alternative Reference Rates Committee, a group of private-market participants and official-sector entities convened by the Board of Governors of the Federal Reserve System (Federal Reserve) and the Federal Reserve Bank of New York, and a broad measure of the cost of borrowing cash overnight collateralized by U.S. Treasury securities. Also, in 2019, the Corporation issued debt linked to SOFR, and the Corporation co-arranged one of the first credit facilities linked to SOFR and has implemented fallback provisions into certain new IBOR-based products and contracts. The Corporation continues to monitor the development and usage of ARRs, including SOFR. For more information on the expected replacement of LIBOR and other benchmark rates, see Item 1A. Risk Factors of our 2019 Annual Report on Form 10-K.

Financial Highlights

In the Consolidated Statement of Income, amounts related to certain asset and liability management (ALM) activities have been reclassified from other income to market making and similar activities, which was previously referred to as trading account income. All prior periods presented reflect this change, which has no impact on the Corporation's total noninterest income or net income, and has no impact on business segment results. For more information, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

Table 1 Summary Income Statement and Selected Financial Data

(Dollars in millions, except per share information)	2019	2018
Income statement		
Net interest income	$ 48,891	$ 48,162
Noninterest income	42,353	42,858
Total revenue, net of interest expense	91,244	91,020
Provision for credit losses	3,590	3,282
Noninterest expense	54,900	53,154
Income before income taxes	32,754	34,584
Income tax expense	5,324	6,437
Net income	27,430	28,147
Preferred stock dividends	1,432	1,451
Net income applicable to common shareholders	$ 25,998	$ 26,696
Per common share information		
Earnings	$ 2.77	$ 2.64
Diluted earnings	2.75	2.61
Dividends paid	0.66	0.54
Performance ratios		
Return on average assets	1.14%	1.21%
Return on average common shareholders' equity	10.62	11.04
Return on average tangible common shareholders' equity [1]	14.86	15.55
Efficiency ratio	60.17	58.40
Balance sheet at year end		
Total loans and leases	$ 983,426	$ 946,895
Total assets	2,434,079	2,354,507
Total deposits	1,434,803	1,381,476
Total liabilities	2,169,269	2,089,182
Total common shareholders' equity	241,409	242,999
Total shareholders' equity	264,810	265,325

(1) Return on average tangible common shareholders' equity is a non-GAAP financial measure. For more information and a corresponding reconciliation to the most closely related financial measures defined by accounting principles generally accepted in the United States of America, see Non-GAAP Reconciliations on page 101.

Net income was $27.4 billion or $2.75 per diluted share in 2019 compared to $28.1 billion, or $2.61 per diluted share in 2018. The decrease in net income was primarily driven by an increase in noninterest expense as a result of the $2.1 billion pretax impairment charge related to the notice of termination of the merchant services joint venture at the conclusion of its current term. Also contributing to the decrease in net income were higher provision for credit losses and lower noninterest income, partially offset by an increase in net interest income.

For discussion and analysis of our consolidated and business segment results of operations for 2018 compared to 2017, see the Financial Highlights and Business Segment Operations sections in the MD&A of the Corporation's 2018 Annual Report on Form 10-K.

Net Interest Income

Net interest income increased $729 million to $48.9 billion in 2019 compared 2018. Net interest yield on a fully taxable-equivalent (FTE) basis decreased two basis points (bps) to 2.43 percent for 2019. The increase in net interest income was primarily driven by loan and deposit growth, partially offset by lower long-end rates. Assuming a stable economic and interest rate environment compared to December 31, 2019, we expect quarterly net interest income for the first two quarters of 2020 to be lower compared to the fourth quarter of 2019 driven by the impact of rates and one fewer day of interest accruals. Quarterly net interest income is expected to rise modestly in the second half of 2020 due to one additional day of interest accruals and expected loan and deposit growth. For more information on net interest yield and the FTE basis, see Supplemental Financial Data on page 48, and for more information on interest rate risk management, see Interest Rate Risk Management for the Banking Book on page 95.

Noninterest Income

Table 2 Noninterest Income

(Dollars in millions)	2019	2018
Fees and commissions:		
Card income	$ 5,797	$ 5,824
Service charges	7,674	7,767
Investment and brokerage services	13,902	14,160
Investment banking fees	5,642	5,327
Total fees and commissions	33,015	33,078
Market making and similar activities	9,034	9,008
Other income	304	772
Total noninterest income	$ 42,353	$ 42,858

Noninterest income decreased $505 million to $42.4 billion in 2019 compared to 2018. The following highlights the significant changes.

- Service charges decreased $93 million primarily driven by lower fees due to policy changes in 2018 and lower ATM volume in *Consumer Banking*.
- Investment and brokerage services income decreased $258 million primarily due to lower transactional revenue and a decrease in assets under management (AUM) pricing, partially offset by the positive impact of AUM flows and higher market valuations.
- Investment banking fees increased $315 million due to increases in advisory fees and equity and debt underwriting fees.
- Other income decreased $468 million primarily due to lower gains on sales of non-core consumer loans and higher partnership losses associated with an increase in tax-advantaged investments, partially offset by higher gains on sales of debt securities.

Provision for Credit Losses

The provision for credit losses increased $308 million to $3.6 billion in 2019 compared to 2018. The increase was primarily due to the energy reserve releases in the commercial portfolio in 2018, partially offset by the impact of recoveries recorded in connection with sales of previously charged-off non-core consumer real estate loans. For more information on the provision for credit losses, see Provision for Credit Losses on page 89.

Noninterest Expense

Table 3 Noninterest Expense

(Dollars in millions)	2019	2018
Compensation and benefits	$ 31,977	$ 31,880
Occupancy and equipment	6,588	6,380
Information processing and communications	4,646	4,555
Product delivery and transaction related	2,762	2,857
Marketing	1,934	1,674
Professional fees	1,597	1,699
Other general operating	5,396	4,109
Total noninterest expense	$ 54,900	$ 53,154

Noninterest expense increased $1.7 billion to $54.9 billion in 2019 compared to 2018. The increase was primarily due to the aforementioned impairment charge related to our merchant services joint venture of $2.1 billion as well as increased costs associated with investment in the businesses, including brand-related marketing costs, and higher litigation expense. These were partially offset by efficiency savings, lower Federal Deposit Insurance Corporation (FDIC) expense and lower amortization of intangibles expense.

Income Tax Expense

Table 4 Income Tax Expense

(Dollars in millions)	2019	2018
Income before income taxes	$ 32,754	$ 34,584
Income tax expense	5,324	6,437
Effective tax rate	16.3%	18.6%

The effective tax rates for 2019 and 2018 reflect the impact of our recurring tax preference benefits. The 2019 effective rate also included net tax benefits primarily related to the resolution of various tax controversy matters.

We expect the effective tax rate for 2020 to be approximately 18 percent, absent unusual items.

Balance Sheet Overview

Table 5 Selected Balance Sheet Data

	December 31		
(Dollars in millions)	2019	2018	% Change
Assets			
Cash and cash equivalents	$ 161,560	$ 177,404	(9)%
Federal funds sold and securities borrowed or purchased under agreements to resell	274,597	261,131	5
Trading account assets	229,826	214,348	7
Debt securities	472,197	441,753	7
Loans and leases	983,426	946,895	4
Allowance for loan and lease losses	(9,416)	(9,601)	(2)
All other assets	321,889	322,577	—
Total assets	$ 2,434,079	$ 2,354,507	3
Liabilities			
Deposits	$ 1,434,803	$ 1,381,476	4
Federal funds purchased and securities loaned or sold under agreements to repurchase	165,109	186,988	(12)
Trading account liabilities	83,270	68,220	22
Short-term borrowings	24,204	20,189	20
Long-term debt	240,856	229,392	5
All other liabilities	221,027	202,917	9
Total liabilities	2,169,269	2,089,182	4
Shareholders' equity	264,810	265,325	—
Total liabilities and shareholders' equity	$ 2,434,079	$ 2,354,507	3

Assets

At December 31, 2019, total assets were approximately $2.4 trillion, up $79.6 billion from December 31, 2018. The increase in assets was primarily due to higher loans and leases and debt securities primarily funded by deposit growth.

Cash and Cash Equivalents

Cash and cash equivalents decreased $15.8 billion driven by investment of short-term excess cash into securities purchased under agreements to resell, debt securities and growth in loans and leases.

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 $13.5 billion due to investment of excess cash levels.

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 $15.5 billion primarily driven by additional inventory in *Global Markets* to facilitate 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 $30.4 billion primarily driven by the deployment of deposit inflows. For more information on debt securities, see *Note 4 – Securities* to the Consolidated Financial Statements.

Loans and Leases

Loans and leases increased $36.5 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 74.

Allowance for Loan and Lease Losses

The allowance for loan and lease losses decreased $185 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 more information, see Allowance for Credit Losses on page 89.

Liabilities

At December 31, 2019, total liabilities were approximately $2.2 trillion, up $80.1 billion from December 31, 2018, primarily due to deposit growth.

Deposits

Deposits increased $53.3 billion primarily due to increases in both retail and wholesale 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 decreased $21.9 billion primarily driven by balance sheet efficiencies 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 increased $15.1 billion primarily due to higher levels of short positions in government and corporate bonds driven by 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 increased $4.0 billion primarily due to an increase in short-term FHLB advances to manage liquidity needs. For more information on short-term borrowings, see *Note 11 – 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 $11.5 billion primarily driven by debt issuances and valuation adjustments, partially offset by maturities and redemptions. For more information on long-term debt, see *Note 12 – Long-term Debt* to the Consolidated Financial Statements.

All Other Liabilities

All other liabilities increased $18.1 billion primarily driven by an increase in broker-dealer payables within *Global Markets* due to timing of unsettled trades and an increase in lease liabilities due to implementation of the new lease accounting standard.

Shareholders' Equity

Shareholders' equity decreased $515 million driven by returns of capital to shareholders through share repurchases, common and preferred stock dividends of $35.7 billion, as well as redemption of preferred stock, largely offset by earnings, market value increases on debt securities and issuances of preferred stock.

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 71.

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 accounting principles generally accepted in the United States of America (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 use the federal statutory tax rate of 21 percent for 2019 and 2018 (35 percent for 2017) 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 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 shareholders' equity or common shareholders' equity reduced by goodwill and intangible assets (excluding mortgage servicing rights (MSRs)), net of related deferred tax liabilities ("adjusted" shareholders' equity or common shareholders' equity). 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 net income applicable to common shareholders as a percentage of adjusted average common shareholders' equity. The tangible common equity ratio represents adjusted ending common shareholders' equity divided by total tangible assets.
- Return on average tangible shareholders' equity measures our net income as a percentage of adjusted average total shareholders' equity. The tangible equity ratio represents adjusted ending shareholders' equity divided by total tangible assets.
- 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 common 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 6 and 7.

For more information on the reconciliation of these non-GAAP financial measures to the corresponding GAAP financial measures, see Non-GAAP Reconciliations on page 101.

Table 6 Five-year Summary of Selected Financial Data

(In millions, except per share information)	2019	2018	2017	2016	2015
Income statement					
Net interest income	**$ 48,891**	$ 48,162	$ 45,239	$ 41,486	$ 38,958
Noninterest income	**42,353**	42,858	41,887	42,012	44,007
Total revenue, net of interest expense	**91,244**	91,020	87,126	83,498	82,965
Provision for credit losses	**3,590**	3,282	3,396	3,597	3,161
Noninterest expense	**54,900**	53,154	54,517	54,880	57,617
Income before income taxes	**32,754**	34,584	29,213	25,021	22,187
Income tax expense	**5,324**	6,437	10,981	7,199	6,277
Net income	**27,430**	28,147	18,232	17,822	15,910
Net income applicable to common shareholders	**25,998**	26,696	16,618	16,140	14,427
Average common shares issued and outstanding	**9,390.5**	10,096.5	10,195.6	10,248.1	10,462.3
Average diluted common shares issued and outstanding	**9,442.9**	10,236.9	10,778.4	11,046.8	11,236.2
Performance ratios					
Return on average assets	**1.14%**	1.21%	0.80%	0.81%	0.74%
Return on average common shareholders' equity	**10.62**	11.04	6.72	6.69	6.28
Return on average tangible common shareholders' equity (1)	**14.86**	15.55	9.41	9.51	9.16
Return on average shareholders' equity	**10.24**	10.63	6.72	6.70	6.33
Return on average tangible shareholders' equity (1)	**13.85**	14.46	9.08	9.17	8.88
Total ending equity to total ending assets	**10.88**	11.27	11.71	12.17	11.92
Total average equity to total average assets	**11.14**	11.39	11.96	12.14	11.64
Dividend payout	**23.65**	20.31	24.24	15.94	14.49
Per common share data					
Earnings	**$ 2.77**	$ 2.64	$ 1.63	$ 1.57	$ 1.38
Diluted earnings	**2.75**	2.61	1.56	1.49	1.31
Dividends paid	**0.66**	0.54	0.39	0.25	0.20
Book value	**27.32**	25.13	23.80	23.97	22.48
Tangible book value (1)	**19.41**	17.91	16.96	16.89	15.56
Market capitalization	**$ 311,209**	$ 238,251	$ 303,681	$ 222,163	$ 174,700
Average balance sheet					
Total loans and leases	**$ 958,416**	$ 933,049	$ 918,731	$ 900,433	$ 876,787
Total assets	**2,405,830**	2,325,246	2,268,633	2,190,218	2,160,536
Total deposits	**1,380,326**	1,314,941	1,269,796	1,222,561	1,155,860
Long-term debt	**201,623**	200,399	194,882	204,826	240,059
Common shareholders' equity	**244,853**	241,799	247,101	241,187	229,576
Total shareholders' equity	**267,889**	264,748	271,289	265,843	251,384
Asset quality (2)					
Allowance for credit losses (3)	**$ 10,229**	$ 10,398	$ 11,170	$ 11,999	$ 12,880
Nonperforming loans, leases and foreclosed properties (4)	**3,837**	5,244	6,758	8,084	9,836
Allowance for loan and lease losses as a percentage of total loans and leases outstanding (4)	**0.97%**	1.02%	1.12%	1.26%	1.37%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases (4)	**265**	194	161	149	130
Net charge-offs	**$ 3,648**	$ 3,763	$ 3,979	$ 3,821	$ 4,338
Net charge-offs as a percentage of average loans and leases outstanding (4)	**0.38%**	0.41%	0.44%	0.43%	0.50%
Capital ratios at year end (5)					
Common equity tier 1 capital	**11.2%**	11.6%	11.5%	10.8%	9.8%
Tier 1 capital	**12.6**	13.2	13.0	12.4	11.2
Total capital	**14.7**	15.1	14.8	14.2	12.8
Tier 1 leverage	**7.9**	8.4	8.6	8.8	8.4
Supplementary leverage ratio	**6.4**	6.8	n/a	n/a	n/a
Tangible equity (1)	**8.2**	8.6	8.9	9.2	8.9
Tangible common equity (1)	**7.3**	7.6	7.9	8.0	7.8

(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 48 and Non-GAAP Reconciliations on page 101.

(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 non-U.S. consumer credit card business was sold 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 80 and corresponding Table 29 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 84 and corresponding Table 36.

(5) 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 more information, including which approach is used to assess capital adequacy, see Capital Management on page 66.

n/a = not applicable

Table 7 Selected Quarterly Financial Data

(In millions, except per share information)	2019 Quarters Fourth	2019 Third	2019 Second	2019 First	2018 Quarters Fourth	2018 Third	2018 Second	2018 First
Income statement								
Net interest income	**$ 12,140**	$ 12,187	$ 12,189	$ 12,375	$ 12,504	$ 12,061	$ 11,828	$ 11,769
Noninterest income	**10,209**	10,620	10,895	10,629	10,173	10,663	10,721	11,301
Total revenue, net of interest expense	**22,349**	22,807	23,084	23,004	22,677	22,724	22,549	23,070
Provision for credit losses	**941**	779	857	1,013	905	716	827	834
Noninterest expense	**13,239**	15,169	13,268	13,224	13,074	13,014	13,224	13,842
Income before income taxes	**8,169**	6,859	8,959	8,767	8,698	8,994	8,498	8,394
Income tax expense	**1,175**	1,082	1,611	1,456	1,420	1,827	1,714	1,476
Net income	**6,994**	5,777	7,348	7,311	7,278	7,167	6,784	6,918
Net income applicable to common shareholders	**6,748**	5,272	7,109	6,869	7,039	6,701	6,466	6,490
Average common shares issued and outstanding	**9,017.1**	9,303.6	9,523.2	9,725.9	9,855.8	10,031.6	10,181.7	10,322.4
Average diluted common shares issued and outstanding	**9,079.5**	9,353.0	9,559.6	9,787.3	9,996.0	10,170.8	10,309.4	10,472.7
Performance ratios								
Return on average assets	**1.13%**	0.95%	1.23%	1.26%	1.24%	1.23%	1.17%	1.21%
Four-quarter trailing return on average assets [1]	**1.14**	1.17	1.24	1.22	1.21	1.00	0.93	0.86
Return on average common shareholders' equity	**11.00**	8.48	11.62	11.42	11.57	10.99	10.75	10.85
Return on average tangible common shareholders' equity [2]	**15.43**	11.84	16.24	16.01	16.29	15.48	15.15	15.26
Return on average shareholders' equity	**10.40**	8.48	11.00	11.14	10.95	10.74	10.26	10.57
Return on average tangible shareholders' equity [2]	**14.09**	11.43	14.88	15.10	14.90	14.61	13.95	14.37
Total ending equity to total ending assets	**10.88**	11.06	11.33	11.23	11.27	11.21	11.53	11.43
Total average equity to total average assets	**10.89**	11.21	11.17	11.28	11.30	11.42	11.42	11.41
Dividend payout	**23.90**	31.48	19.95	21.20	20.90	22.35	18.83	19.06
Per common share data								
Earnings	**$ 0.75**	$ 0.57	$ 0.75	$ 0.71	$ 0.71	$ 0.67	$ 0.64	$ 0.63
Diluted earnings	**0.74**	0.56	0.74	0.70	0.70	0.66	0.63	0.62
Dividends paid	**0.18**	0.18	0.15	0.15	0.15	0.15	0.12	0.12
Book value	**27.32**	26.96	26.41	25.57	25.13	24.33	24.07	23.74
Tangible book value [2]	**19.41**	19.26	18.92	18.26	17.91	17.23	17.07	16.84
Market capitalization	**$ 311,209**	$ 264,842	$ 270,935	$ 263,992	$ 238,251	$ 290,424	$ 282,259	$ 305,176
Average balance sheet								
Total loans and leases	**$ 973,986**	$ 964,733	$ 950,525	$ 944,020	$ 934,721	$ 930,736	$ 934,818	$ 931,915
Total assets	**2,450,005**	2,412,223	2,399,051	2,360,992	2,334,586	2,317,829	2,322,678	2,325,878
Total deposits	**1,410,439**	1,375,052	1,375,450	1,359,864	1,344,951	1,316,345	1,300,659	1,297,268
Long-term debt	**206,026**	202,620	201,007	196,726	201,056	203,239	199,448	197,787
Common shareholders' equity	**243,439**	246,630	245,438	243,891	241,372	241,812	241,313	242,713
Total shareholders' equity	**266,900**	270,430	267,975	266,217	263,698	264,653	265,181	265,480
Asset quality								
Allowance for credit losses [3]	**$ 10,229**	$ 10,242	$ 10,333	$ 10,379	$ 10,398	$ 10,526	$ 10,837	$ 11,042
Nonperforming loans, leases and foreclosed properties [4]	**3,837**	3,723	4,452	5,145	5,244	5,449	6,181	6,694
Allowance for loan and lease losses as a percentage of total loans and leases outstanding [4]	**0.97%**	0.98%	1.00%	1.02%	1.02%	1.05%	1.08%	1.11%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases [4]	**265**	271	228	197	194	189	170	161
Net charge-offs	**$ 959**	$ 811	$ 887	$ 991	$ 924	$ 932	$ 996	$ 911
Annualized net charge-offs as a percentage of average loans and leases outstanding [4]	**0.39%**	0.34%	0.38%	0.43%	0.39%	0.40%	0.43%	0.40%
Capital ratios at period end								
Common equity tier 1 capital	**11.2%**	11.4%	11.7%	11.6%	11.6%	11.4%	11.4%	11.3%
Tier 1 capital	**12.6**	12.9	13.3	13.1	13.2	12.9	13.0	13.0
Total capital	**14.7**	15.1	15.4	15.2	15.1	14.7	14.8	14.8
Tier 1 leverage	**7.9**	8.2	8.4	8.4	8.4	8.3	8.4	8.4
Supplementary leverage ratio	**6.4**	6.6	6.8	6.8	6.8	6.7	6.7	6.8
Tangible equity [2]	**8.2**	8.4	8.7	8.5	8.6	8.5	8.7	8.7
Tangible common equity [2]	**7.3**	7.4	7.6	7.6	7.6	7.5	7.7	7.6
Total loss-absorbing capacity and long-term debt metrics [5]								
Total loss-absorbing capacity to risk-weighted assets	**24.6%**	24.8%	25.5%	24.8%				
Total loss-absorbing capacity to supplementary leverage exposure	**12.5**	12.7	13.0	12.8				
Eligible long-term debt to risk-weighted assets	**11.5**	11.4	11.8	11.4				
Eligible long-term debt to supplementary leverage	**5.8**	5.8	6.0	5.9				

(1) Calculated as total net income for four consecutive quarters divided by annualized average assets for four consecutive quarters.
(2) 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 48 and Non-GAAP Reconciliations on page 101.
(3) Includes the allowance for loan and lease 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 80 and corresponding Table 29 and Commercial Portfolio Credit Risk Management – Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity on page 84 and corresponding Table 36.
(5) Effective January 1, 2019, we became subject to minimum total loss-absorbing capacity and long-term debt requirements. For more information, see Capital Management on page 66.

Table 8 Average Balances and Interest Rates - FTE Basis

(Dollars in millions)	Average Balance	Interest Income/ Expense [1]	Yield/ Rate	Average Balance	Interest Income/ Expense [1]	Yield/ Rate	Average Balance	Interest Income/ Expense [1]	Yield/ Rate
	2019			2018			2017		
Earning assets									
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	$ 125,555	$ 1,823	1.45%	$ 139,848	$ 1,926	1.38%	$ 127,431	$ 1,122	0.88%
Time deposits placed and other short-term investments	9,427	207	2.19	9,446	216	2.29	12,112	241	1.99
Federal funds sold and securities borrowed or purchased under agreements to resell	279,610	4,843	1.73	251,328	3,176	1.26	222,818	1,806	0.81
Trading account assets	148,076	5,269	3.56	132,724	4,901	3.69	129,007	4,618	3.58
Debt securities	450,090	11,917	2.65	437,312	11,837	2.66	435,005	10,626	2.44
Loans and leases [2]:									
Residential mortgage	220,552	7,651	3.47	207,523	7,294	3.51	197,766	6,831	3.45
Home equity	44,600	2,194	4.92	53,886	2,573	4.77	62,260	2,608	4.19
Credit card	94,488	10,166	10.76	94,612	9,579	10.12	91,068	8,791	9.65
Non-U.S. credit card [3]	—	—	—	—	—	—	3,929	358	9.12
Direct/Indirect and other consumer [4]	90,656	3,261	3.60	93,036	3,104	3.34	96,002	2,734	2.85
Total consumer	450,296	23,272	5.17	449,057	22,550	5.02	451,025	21,322	4.73
U.S. commercial	321,467	13,016	4.05	304,387	11,937	3.92	292,452	9,765	3.34
Non-U.S. commercial	103,918	3,547	3.41	97,664	3,220	3.30	95,005	2,566	2.70
Commercial real estate [5]	62,044	2,741	4.42	60,384	2,618	4.34	58,502	2,116	3.62
Commercial lease financing	20,691	718	3.47	21,557	698	3.24	21,747	706	3.25
Total commercial	508,120	20,022	3.94	483,992	18,473	3.82	467,706	15,153	3.24
Total loans and leases [3]	958,416	43,294	4.52	933,049	41,023	4.40	918,731	36,475	3.97
Other earning assets	69,089	4,478	6.48	76,524	4,300	5.62	76,957	3,224	4.19
Total earning assets	2,040,263	71,831	3.52	1,980,231	67,379	3.40	1,922,061	58,112	3.02
Cash and due from banks	26,193			25,830			27,995		
Other assets, less allowance for loan and lease losses	339,374			319,185			318,577		
Total assets	$ 2,405,830			$ 2,325,246			$ 2,268,633		
Interest-bearing liabilities									
U.S. interest-bearing deposits:									
Savings	$ 52,020	$ 5	0.01%	$ 54,226	$ 6	0.01%	$ 53,783	$ 5	0.01%
NOW and money market deposit accounts	741,126	4,471	0.60	676,382	2,636	0.39	628,647	873	0.14
Consumer CDs and IRAs	47,577	471	0.99	39,823	157	0.39	44,794	121	0.27
Negotiable CDs, public funds and other deposits	66,866	1,407	2.11	50,593	991	1.96	36,782	354	0.96
Total U.S. interest-bearing deposits	907,589	6,354	0.70	821,024	3,790	0.46	764,006	1,353	0.18
Non-U.S. interest-bearing deposits:									
Banks located in non-U.S. countries	1,936	20	1.04	2,312	39	1.69	2,442	21	0.85
Governments and official institutions	181	—	0.05	810	—	0.01	1,006	10	0.95
Time, savings and other	69,351	814	1.17	65,097	666	1.02	62,386	547	0.88
Total non-U.S. interest-bearing deposits	71,468	834	1.17	68,219	705	1.03	65,834	578	0.88
Total interest-bearing deposits	979,057	7,188	0.73	889,243	4,495	0.51	829,840	1,931	0.23
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities	276,432	7,208	2.61	269,748	5,839	2.17	274,975	3,146	1.14
Trading account liabilities	45,449	1,249	2.75	50,928	1,358	2.67	45,518	1,204	2.64
Long-term debt	201,623	6,700	3.32	200,399	6,915	3.45	194,882	5,667	2.91
Total interest-bearing liabilities	1,502,561	22,345	1.49	1,410,318	18,607	1.32	1,345,215	11,948	0.89
Noninterest-bearing sources:									
Noninterest-bearing deposits	401,269			425,698			439,956		
Other liabilities [6]	234,111			224,482			212,173		
Shareholders' equity	267,889			264,748			271,289		
Total liabilities and shareholders' equity	$ 2,405,830			$ 2,325,246			$ 2,268,633		
Net interest spread			2.03%			2.08%			2.13%
Impact of noninterest-bearing sources			0.40			0.37			0.27
Net interest income/yield on earning assets [7]		$ 49,486	2.43%		$ 48,772	2.45%		$ 46,164	2.40%

[1] Includes the impact of interest rate risk management contracts. For more information, see Interest Rate Risk Management for the Banking Book on page 95.
[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 $2.9 billion, $2.8 billion and $2.9 billion for 2019, 2018 and 2017, respectively.
[5] Includes U.S. commercial real estate loans of $57.3 billion, $56.4 billion and $55.0 billion, and non-U.S. commercial real estate loans of $4.7 billion, $4.0 billion and $3.5 billion for 2019, 2018 and 2017, respectively.
[6] Includes $35.5 billion, $30.4 billion and $30.3 billion of structured notes and liabilities for 2019, 2018 and 2017, respectively.
[7] Net interest income includes FTE adjustments of $595 million, $610 million and $925 million for 2019, 2018 and 2017, respectively.

Table 9 Analysis of Changes in Net Interest Income - FTE Basis

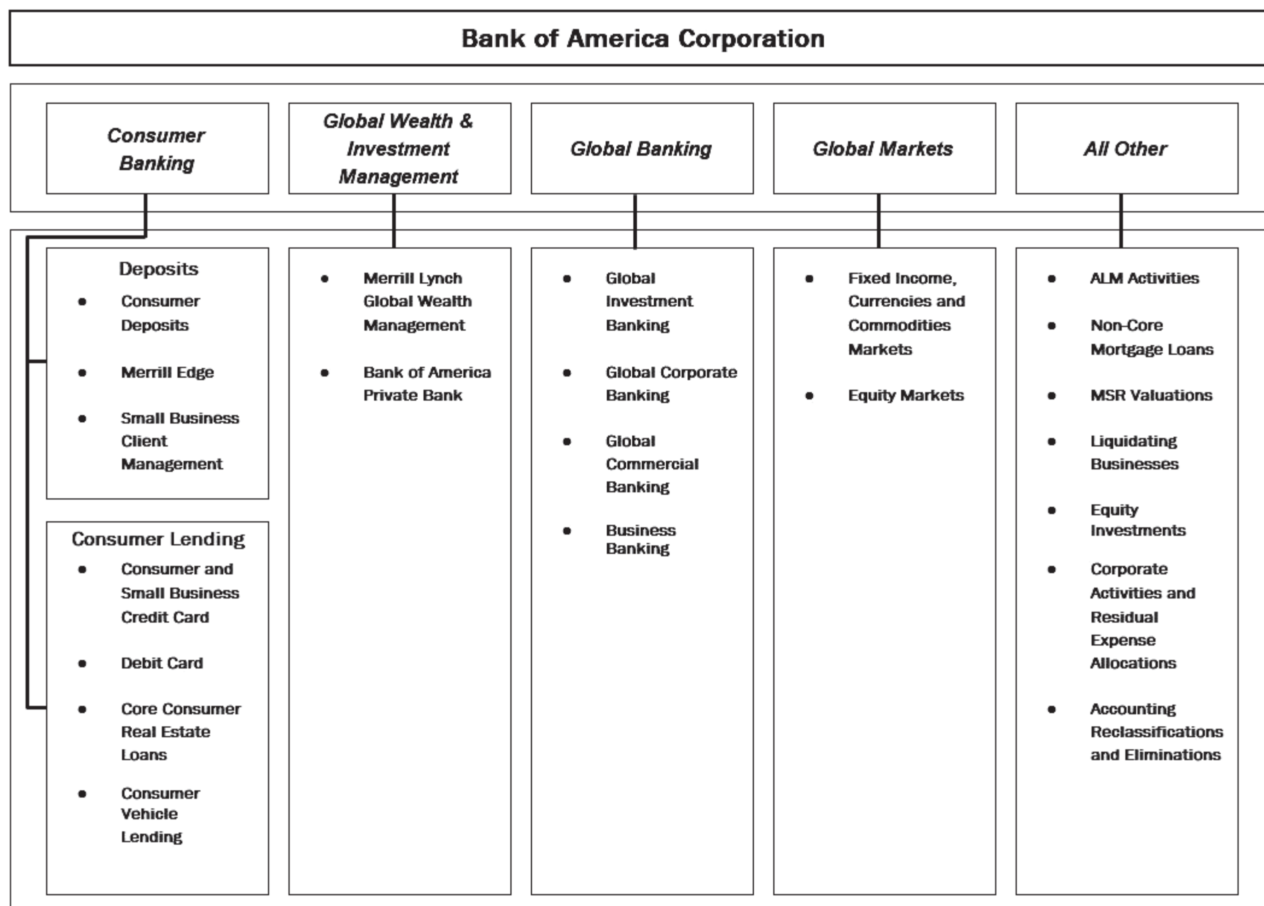
(Dollars in millions)	Due to Change in [1] Volume	Due to Change in [1] Rate	Net Change	Due to Change in [1] Volume	Due to Change in [1] Rate	Net Change
	From 2018 to 2019			From 2017 to 2018		
Increase (decrease) in interest income						
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	$ (193)	$ 90	$ (103)	$ 109	$ 695	$ 804
Time deposits placed and other short-term investments	—	(9)	(9)	(53)	28	(25)
Federal funds sold and securities borrowed or purchased under agreements to resell	347	1,320	1,667	230	1,140	1,370
Trading account assets	563	(195)	368	134	149	283
Debt securities	135	(55)	80	44	1,167	1,211
Loans and leases:						
Residential mortgage	447	(90)	357	329	134	463
Home equity	(446)	67	(379)	(350)	315	(35)
Credit card	(17)	604	587	339	449	788
Non-U.S. credit card [2]	—	—	—	(358)	—	(358)
Direct/Indirect and other consumer	(76)	233	157	(82)	452	370
Total consumer			722			1,228
U.S. commercial	665	414	1,079	402	1,770	2,172
Non-U.S. commercial	209	118	327	71	583	654
Commercial real estate	75	48	123	70	432	502
Commercial lease financing	(28)	48	20	(5)	(3)	(8)
Total commercial			1,549			3,320
Total loans and leases			2,271			4,548
Other earning assets	(417)	595	178	(18)	1,094	1,076
Total interest income			$ 4,452			$ 9,267
Increase (decrease) in interest expense						
U.S. interest-bearing deposits:						
Savings	$ (1)	$ —	$ (1)	$ —	$ 1	$ 1
NOW and money market deposit accounts	254	1,581	1,835	74	1,689	1,763
Consumer CDs and IRAs	29	285	314	(13)	49	36
Negotiable CDs, public funds and other deposits	320	96	416	132	505	637
Total U.S. interest-bearing deposits			2,564			2,437
Non-U.S. interest-bearing deposits:						
Banks located in non-U.S. countries	(6)	(13)	(19)	(1)	19	18
Governments and official institutions	—	—	—	(2)	(8)	(10)
Time, savings and other	41	107	148	26	93	119
Total non-U.S. interest-bearing deposits			129			127
Total interest-bearing deposits			2,693			2,564
Federal funds purchased, securities loaned or sold under agreements to repurchase, short-term borrowings and other interest-bearing liabilities	160	1,209	1,369	(71)	2,764	2,693
Trading account liabilities	(145)	36	(109)	140	14	154
Long-term debt	41	(256)	(215)	165	1,083	1,248
Total interest expense			3,738			6,659
Net increase in net interest income [3]			$ 714			$ 2,608

[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 decreases in FTE basis adjustments of $15 million from 2018 to 2019 and $315 million from 2017 to 2018.

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. 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 63. 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 a reporting unit, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

For more information on our presentation of financial information on an FTE basis, see Supplemental Financial Data on page 48, and for reconciliations to consolidated total revenue, net income and year-end total assets, see *Note 24 – Business Segment Information* to the Consolidated Financial Statements.

Consumer Banking

(Dollars in millions)	Deposits		Consumer Lending		Total Consumer Banking		
	2019	2018	**2019**	2018	**2019**	2018	% Change
Net interest income	**$ 16,904**	$ 15,939	**$ 11,254**	$ 11,086	**$ 28,158**	$ 27,025	4%
Noninterest income:							
Card income	**(33)**	(33)	**5,117**	5,135	**5,084**	5,102	—
Service charges	**4,217**	4,298	**2**	2	**4,219**	4,300	(2)
All other income	**832**	762	**294**	429	**1,126**	1,191	(5)
Total noninterest income	**5,016**	5,027	**5,413**	5,566	**10,429**	10,593	(2)
Total revenue, net of interest expense	**21,920**	20,966	**16,667**	16,652	**38,587**	37,618	3
Provision for credit losses	**269**	195	**3,503**	3,469	**3,772**	3,664	3
Noninterest expense	**10,682**	10,657	**6,936**	7,015	**17,618**	17,672	—
Income before income taxes	**10,969**	10,114	**6,228**	6,168	**17,197**	16,282	6
Income tax expense	**2,687**	2,578	**1,526**	1,572	**4,213**	4,150	2
Net income	**$ 8,282**	$ 7,536	**$ 4,702**	$ 4,596	**$ 12,984**	$ 12,132	7
Effective tax rate [1]					**24.5%**	25.5%	
Net interest yield	**2.40%**	2.34%	**3.80%**	3.97%	**3.81**	3.77	
Return on average allocated capital	**69**	63	**19**	18	**35**	33	
Efficiency ratio	**48.73**	50.83	**41.61**	42.12	**45.66**	46.98	
Balance Sheet							
Average							
Total loans and leases	**$ 5,373**	$ 5,233	**$ 295,562**	$ 278,574	**$ 300,935**	$ 283,807	6%
Total earning assets [2]	**703,444**	682,592	**296,051**	279,217	**738,770**	717,189	3
Total assets [2]	**735,232**	710,925	**306,169**	290,068	**780,676**	756,373	3
Total deposits	**702,908**	678,640	**5,368**	5,533	**708,276**	684,173	4
Allocated capital	**12,000**	12,000	**25,000**	25,000	**37,000**	37,000	—
Year end							
Total loans and leases	**$ 5,472**	$ 5,470	**$ 311,942**	$ 288,865	**$ 317,414**	$ 294,335	8%
Total earning assets [2]	**724,536**	694,672	**312,684**	289,249	**760,137**	728,813	4
Total assets [2]	**758,385**	724,019	**322,717**	299,970	**804,019**	768,881	5
Total deposits	**725,598**	691,666	**5,080**	4,480	**730,678**	696,146	5

[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 38 states and the District of Columbia. Our network includes approximately 4,300 financial centers, approximately 16,800 ATMs, nationwide call centers, and leading digital banking platforms with more than 38 million active users, including over 29 million active mobile users.

Consumer Banking Results

Net income for *Consumer Banking* increased $852 million to $13.0 billion in 2019 compared to 2018 primarily driven by higher net interest income and lower noninterest expense, partially offset by lower noninterest income. Net interest income increased $1.1 billion to $28.2 billion primarily due to growth in deposits and loans. Noninterest income decreased $164 million to $10.4 billion driven by lower service charges and lower mortgage banking income, largely offset by higher results from ALM activities.

The provision for credit losses increased $108 million to $3.8 billion driven by overdrafts and portfolio seasoning in the credit card portfolio. Noninterest expense decreased $54 million to $17.6 billion primarily driven by lower FDIC expense and operating efficiencies, partially offset by continued investment in the business.

The return on average allocated capital was 35 percent, up from 33 percent, driven by higher net income. For information on capital allocated to the business segments, see Business Segment Operations on page 53.

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 $746 million to $8.3 billion driven by higher net interest income. Net interest income increased $965 million to $16.9 billion primarily due to growth in deposits and pricing discipline. Noninterest income decreased $11 million to $5.0 billion primarily driven by lower service charges, largely offset by higher results from ALM activities.

The provision for credit losses increased $74 million to $269 million in 2019. Noninterest expense increased $25 million to $10.7 billion driven by continued investment in the business, partially offset by lower FDIC expense and operating efficiencies.

Average deposits increased $24.3 billion to $702.9 billion in 2019 driven by strong organic growth. Growth in checking and time deposits of $27.0 billion was partially offset by a decline in traditional savings and money market savings of $2.5 billion.

Key Statistics – Deposits

	2019	2018
Total deposit spreads (excludes noninterest costs) (1)	**2.34%**	2.14%
Year end		
Consumer investment assets (in millions) (2)	**$ 240,132**	$185,881
Active digital banking users (units in thousands) (3)	**38,266**	36,264
Active mobile banking users (units in thousands)	**29,174**	26,433
Financial centers	**4,300**	4,341
ATMs	**16,788**	16,255

(1) Includes deposits held in Consumer Lending.
(2) Includes client brokerage assets, deposit sweep balances and AUM in *Consumer Banking*.
(3) Active digital banking users represents mobile and/or online users.

Consumer investment assets increased $54 billion in 2019 driven by strong market performance and client flows. Active mobile banking users increased 3 million reflecting continuing changes in our customers' banking preferences. The number of financial centers declined by a net 41 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 $106 million to $4.7 billion driven by higher net interest income and lower noninterest expense, partially offset by lower noninterest income. Net interest income increased $168 million to $11.3 billion driven by loan growth. Noninterest income decreased $153 million to $5.4 billion primarily driven by lower mortgage banking income and lower card income.

The provision for credit losses increased $34 million to $3.5 billion primarily driven by portfolio seasoning in the credit card portfolio. Noninterest expense decreased $79 million to $6.9 billion primarily driven by operating efficiencies.

Average loans increased $17.0 billion to $295.6 billion primarily driven by increases in residential mortgages and credit card, partially offset by lower home equity loans.

Key Statistics – Consumer Lending

(Dollars in millions)	2019	2018
Total credit card (1)		
Gross interest yield	**10.76%**	10.12%
Risk-adjusted margin	**8.28**	8.25
New accounts (in thousands)	**4,320**	4,544
Purchase volumes	**$ 277,852**	$264,706
Debit card purchase volumes	**$ 360,672**	$338,810

(1) Includes *GWIM's* credit card portfolio.

During 2019, the total credit card risk-adjusted margin increased 3 bps compared to 2018, primarily driven by a portfolio shift away from promotional-rate loans. Total credit card purchase volumes increased $13.1 billion to $277.9 billion, and debit card purchase volumes increased $21.9 billion to $360.7 billion, reflecting higher levels of consumer spending.

Key Statistics – Loan Production (1)

(Dollars in millions)	2019	2018
Total (2):		
First mortgage	**$ 72,467**	$ 41,195
Home equity	**11,131**	14,869
Consumer Banking:		
First mortgage	**$ 49,179**	$ 27,280
Home equity	**9,755**	13,251

(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 increased $21.9 billion and $31.3 billion in 2019 primarily driven by a lower interest rate environment driving higher first-lien mortgage refinances.

Home equity production in *Consumer Banking* and for the total Corporation decreased $3.5 billion and $3.7 billion in 2019 primarily driven by lower demand.

Global Wealth & Investment Management

(Dollars in millions)	2019	2018	% Change
Net interest income	$ 6,504	$ 6,265	4%
Noninterest income:			
Investment and brokerage services	11,870	11,959	(1)
All other income	1,163	1,229	(5)
Total noninterest income	13,033	13,188	(1)
Total revenue, net of interest expense	19,537	19,453	—
Provision for credit losses	82	86	(5)
Noninterest expense	13,823	14,015	(1)
Income before income taxes	5,632	5,352	5
Income tax expense	1,380	1,364	1
Net income	$ 4,252	$ 3,988	7
Effective tax rate	24.5%	25.5%	
Net interest yield	2.33	2.41	
Return on average allocated capital	29	28	
Efficiency ratio	70.75	72.04	
Balance Sheet			
Average			
Total loans and leases	$ 168,910	$ 161,342	5%
Total earning assets	279,684	259,808	8
Total assets	292,003	277,220	5
Total deposits	256,505	241,256	6
Allocated capital	14,500	14,500	—
Year end			
Total loans and leases	$ 176,600	$ 164,854	7%
Total earning assets	287,212	287,199	—
Total assets	299,756	305,907	(2)
Total deposits	263,103	268,700	(2)

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

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.

Bank of America Private Bank, together with MLGWM's Private Wealth Management business, 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 $264 million to $4.3 billion due to lower noninterest expense and higher revenue. The operating margin was 29 percent compared to 28 percent in 2018.

Net interest income increased $239 million to $6.5 billion due to the impact of growth in deposits and loans.

Noninterest income, which primarily includes investment and brokerage services income, decreased $155 million to $13.0 billion. The decrease was primarily driven by declines in AUM pricing and transactional revenue, partially offset by the impact of positive AUM flows and higher market valuations.

Noninterest expense decreased $192 million to $13.8 billion, as investments for business growth were more than offset by lower amortization of intangibles and FDIC expense.

The return on average allocated capital was 29 percent, up from 28 percent, due to higher net income.

MLGWM revenue of $16.1 billion increased one percent primarily driven by higher net interest income and the impact of positive AUM flows and higher market valuations, partially offset by lower transactional volumes and AUM pricing.

Bank of America Private Bank revenue of $3.4 billion decreased one percent primarily due to lower net interest income.

Key Indicators and Metrics

(Dollars in millions, except as noted)	2019	2018
Revenue by Business		
Merrill Lynch Global Wealth Management	**$ 16,111**	$ 15,998
Bank of America Private Bank	**3,426**	3,455
Total revenue, net of interest expense	**$ 19,537**	$ 19,453
Client Balances by Business, at year end		
Merrill Lynch Global Wealth Management	**$ 2,558,102**	$ 2,193,562
Bank of America Private Bank	**489,690**	427,294
Total client balances	**$ 3,047,792**	$ 2,620,856
Client Balances by Type, at year end		
Assets under management	**$ 1,275,555**	$ 1,072,234
Brokerage and other assets	**1,372,733**	1,162,997
Deposits	**263,103**	268,700
Loans and leases [1]	**179,296**	167,938
Less: Managed deposits in assets under management	**(42,895)**	(51,013)
Total client balances	**$ 3,047,792**	$ 2,620,856
Assets Under Management Rollforward		
Assets under management, beginning of year	**$ 1,072,234**	$ 1,121,383
Net client flows	**24,865**	44,607
Market valuation/other	**178,456**	(93,756)
Total assets under management, end of year	**$ 1,275,555**	$ 1,072,234
Associates, at year end		
Number of financial advisors	**17,458**	17,518
Total wealth advisors, including financial advisors	**19,440**	19,459
Total primary sales professionals, including financial advisors and wealth advisors	**20,586**	20,586
Merrill Lynch Global Wealth Management Metric		
Financial advisor productivity (in thousands)	**$ 1,082**	$ 1,034
Bank of America Private Bank Metric, at year end		
Primary sales professionals	**1,766**	1,748

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

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 increased $426.9 billion, or 16 percent, to $3.0 trillion at December 31, 2019 compared to December 31, 2018. The increase in client balances was primarily due to higher market valuations and positive net flows over the last year.

Global Banking

(Dollars in millions)		2019		2018	% Change
Net interest income	$	**10,675**	$	10,993	(3)%
Noninterest income:					
Service charges		**3,015**		3,027	—
Investment banking fees		**3,137**		2,891	9
All other income		**3,656**		3,090	18
Total noninterest income		**9,808**		9,008	9
Total revenue, net of interest expense		**20,483**		20,001	2
Provision for credit losses		**414**		8	n/m
Noninterest expense		**9,017**		8,745	3
Income before income taxes		**11,052**		11,248	(2)
Income tax expense		**2,984**		2,923	2
Net income	$	**8,068**	$	8,325	(3)
Effective tax rate		**27.0%**		26.0%	
Net interest yield		**2.75**		3.01	
Return on average allocated capital		**20**		20	
Efficiency ratio		**44.02**		43.72	
Balance Sheet					
Average					
Total loans and leases	$	**374,304**	$	354,236	6 %
Total earning assets		**388,152**		364,748	6
Total assets		**443,083**		425,675	4
Total deposits		**362,731**		336,337	8
Allocated capital		**41,000**		41,000	—
Year end					
Total loans and leases	$	**379,268**	$	365,717	4 %
Total earning assets		**407,180**		377,812	8
Total assets		**464,032**		442,330	5
Total deposits		**383,180**		360,248	6

n/m = not meaningful

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* decreased $257 million to $8.1 billion in 2019 compared to 2018 primarily driven by higher provision for credit losses and noninterest expense partially offset by higher revenue.

Revenue increased $482 million to $20.5 billion driven by higher noninterest income, partially offset by lower net interest income. Net interest income decreased $318 million to $10.7 billion primarily due to the allocation of ALM results and credit spread compression, partly offset by growth in loan and deposit balances.

Noninterest income increased $800 million to $9.8 billion primarily due to higher leasing-related revenue and investment banking fees. The provision for credit losses increased $406 million to $414 million primarily driven by reserve releases in 2018 primarily from energy exposures. Noninterest expense increased $272 million primarily due to continued investment in the business partially offset by lower FDIC expense.

The return on average allocated capital was 20 percent in 2019 and 2018. For information on capital allocated to the business segments, see Business Segment Operations on page 53.

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		Global Commercial Banking		Business Banking		Total	
	2019	2018	**2019**	2018	**2019**	2018	**2019**	2018
Revenue								
Business Lending	**$ 3,994**	$ 3,904	**$ 4,132**	$ 4,330	**$ 363**	$ 431	**$ 8,489**	$ 8,665
Global Transaction Services	**3,994**	3,832	**3,499**	3,346	**1,064**	987	**8,557**	8,165
Total revenue, net of interest expense	**$ 7,988**	$ 7,736	**$ 7,631**	$ 7,676	**$ 1,427**	$ 1,418	**$ 17,046**	$ 16,830
Balance Sheet								
Average								
Total loans and leases	**$ 177,713**	$ 163,516	**$ 181,485**	$ 174,279	**$ 15,058**	$ 16,432	**$ 374,256**	$ 354,227
Total deposits	**177,924**	163,559	**144,620**	135,337	**40,196**	37,462	**362,740**	336,358
Year end								
Total loans and leases	**$ 181,409**	$ 174,378	**$ 182,727**	$ 175,937	**$ 15,152**	$ 15,402	**$ 379,288**	$ 365,717
Total deposits	**185,352**	173,183	**157,322**	149,118	**40,504**	37,973	**383,178**	360,274

Business Lending revenue decreased $176 million in 2019 compared to 2018. The decrease was primarily driven by the allocation of ALM results, partly offset by higher leasing-related revenue.

Global Transaction Services revenue increased $392 million in 2019 compared to 2018 driven by the impact of higher deposit balances.

Average loans and leases increased six percent in 2019 compared to 2018 driven by growth in the commercial and industrial portfolio. 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		Total Corporation	
	2019	2018	**2019**	2018
Products				
Advisory	**$ 1,336**	$ 1,153	**$ 1,460**	$ 1,258
Debt issuance	**1,348**	1,326	**3,107**	3,084
Equity issuance	**453**	412	**1,259**	1,183
Gross investment banking fees	**3,137**	2,891	**5,826**	5,525
Self-led deals	**(62)**	(68)	**(184)**	(198)
Total investment banking fees	**$ 3,075**	$ 2,823	**$ 5,642**	$ 5,327

Total Corporation investment banking fees, excluding self-led deals, of $5.6 billion, which are primarily included within *Global Banking* and *Global Markets*, increased six percent due to increases in advisory fees as well as higher equity issuance fees.

Global Markets

(Dollars in millions)		2019		2018	% Change
Net interest income	$	3,915	$	3,857	2%
Noninterest income:					
Investment and brokerage services		1,738		1,780	(2)
Investment banking fees		2,288		2,296	—
Market making and similar activities		7,065		7,260	(3)
All other income		608		990	(39)
Total noninterest income		11,699		12,326	(5)
Total revenue, net of interest expense		15,614		16,183	(4)
Provision for credit losses		(9)		—	n/m
Noninterest expense		10,722		10,835	(1)
Income before income taxes		4,901		5,348	(8)
Income tax expense		1,397		1,390	1
Net income	$	3,504	$	3,958	(11)
Effective tax rate		28.5%		26.0%	
Return on average allocated capital		10		11	
Efficiency ratio		68.67		66.96	
Balance Sheet					
Average					
Trading-related assets:					
Trading account securities	$	246,335	$	215,112	15%
Reverse repurchases		116,883		125,084	(7)
Securities borrowed		83,216		78,889	5
Derivative assets		43,271		46,047	(6)
Total trading-related assets		489,705		465,132	5
Total loans and leases		71,334		72,651	(2)
Total earning assets		476,225		473,383	1
Total assets		679,297		666,000	2
Total deposits		31,380		31,209	1
Allocated capital		35,000		35,000	—
Year end					
Total trading-related assets	$	452,496	$	447,998	1%
Total loans and leases		72,993		73,928	(1)
Total earning assets		471,701		457,224	3
Total assets		641,806		641,923	—
Total deposits		34,676		37,841	(8)

n/m = not meaningful

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 59.

The following explanations for year-over-year changes in results for *Global Markets*, including those disclosed under Sales and Trading Revenue, exclude net DVA, but the explanations would be the same if net DVA was included.

Net income for *Global Markets* decreased $454 million to $3.5 billion in 2019 compared to 2018. Net DVA losses were $222 million compared to losses of $162 million in 2018. Excluding net DVA, net income decreased $408 million to $3.7 billion. These decreases were primarily driven by a decrease in revenue, partially offset by lower noninterest expense.

Revenue declined $569 million to $15.6 billion as sales and trading revenue decreased $492 million, and excluding net DVA, decreased $432 million. These decreases were primarily driven by a decline in Equities revenue. Noninterest expense decreased $113 million to $10.7 billion, primarily driven by lower revenue-related expenses.

Average total assets increased $13.3 billion to $679.3 billion, primarily due to increased levels of inventory in fixed-income, currencies and commodities (FICC) to facilitate expected client demand. Year-end total assets were largely unchanged at $641.8 billion.

The return on average allocated capital was 10 percent, down from 11 percent, reflecting lower net income. For information on

capital allocated to the business segments, see Business Segment Operations on page 53.

Sales and Trading Revenue

Sales and trading revenue includes unrealized and realized gains and losses on trading and other assets which are included in market making and similar activities, 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 48.

Sales and Trading Revenue [1, 2, 3]

(Dollars in millions)	2019	2018
Sales and trading revenue [2]		
Fixed-income, currencies and commodities	$ 8,188	$ 8,271
Equities	4,491	4,900
Total sales and trading revenue	$ 12,679	$ 13,171
Sales and trading revenue, excluding net DVA [4]		
Fixed-income, currencies and commodities	$ 8,396	$ 8,413
Equities	4,505	4,920
Total sales and trading revenue, excluding net DVA	$ 12,901	$ 13,333

(1) For more information on sales and trading revenue, see *Note 3 – Derivatives* to the Consolidated Financial Statements.
(2) Includes FTE adjustments of $189 million and $248 million for 2019 and 2018.
(3) Includes *Global Banking* sales and trading revenue of $533 million and $421 million for 2019 and 2018.
(4) FICC and Equities sales and trading revenue, excluding net DVA, is a non-GAAP financial measure. FICC net DVA losses were $208 million and $142 million for 2019 and 2018. Equities net DVA losses were $14 million and $20 million for 2019 and 2018.

FICC revenue decreased $17 million. Equities revenue decreased $415 million driven by under performance in equity derivatives compared to a strong prior year which benefited from higher client activity and a more volatile market environment.

All Other

(Dollars in millions)	2019	2018	% Change
Net interest income	$ 234	$ 632	(63)%
Noninterest income (loss)	(2,616)	(2,257)	16
Total revenue, net of interest expense	(2,382)	(1,625)	47
Provision for credit losses	(669)	(476)	41
Noninterest expense	3,720	1,887	97
Loss before income taxes	(5,433)	(3,036)	79
Income tax benefit	(4,055)	(2,780)	46
Net loss	$ (1,378)	$ (256)	n/m
Balance Sheet			
Average			
Total loans and leases	$ 42,933	$ 61,013	(30)%
Total assets [1]	210,771	199,978	5
Total deposits	21,434	21,966	(2)
Year end			
Total loans and leases	$ 37,151	$ 48,061	(23)%
Total assets [1]	224,466	195,466	15
Total deposits	23,166	18,541	25

(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 544.2 billion and $517.0 billion for 2019 and 2018, and year-end allocated assets were $565.3 billion and $540.8 billion at December 31, 2019 and 2018.
n/m = not meaningful

All Other consists of ALM activities, equity investments, non-core mortgage loans and servicing activities, liquidating businesses and certain expenses not otherwise allocated to a business segment. ALM activities encompass certain residential mortgages, debt securities, and interest rate and foreign currency risk management activities. Substantially all of the results of ALM activities are allocated to our business segments. For more information on our ALM activities, see *Note 24 – 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 information on our merchant services joint venture, see *Note 13 – Commitments and Contingencies* to the Consolidated Financial Statements.

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 2019, residential mortgage loans held for ALM activities decreased $3.2 billion to $21.7 billion 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 2019, total non-core loans decreased $7.8 billion to $15.7 billion due primarily to payoffs, paydowns and sales, as well as Federal Housing Administration (FHA) loan conveyances, partially offset by repurchases. For more information on the composition of the core and non-core portfolios, see Consumer Portfolio Credit Risk Management on page 75.

The net loss for *All* Other increased $1.1 billion to a net loss of $1.4 billion, primarily driven by the $2.1 billion pretax impairment charge disclosed in Executive Summary – Recent Developments – Merchant Services Joint Venture, as well as lower revenue, partially offset by a higher benefit in the provision for credit losses.

Revenue decreased $757 million due to lower net interest income and an increase in the loss in noninterest income. Net interest income decreased $398 million due to the impact of non-core consumer real estate loan sales and portfolio run-off. The loss in noninterest income increased $359 million primarily due to lower gains on sales of non-core consumer loans and higher partnership losses associated with an increase in tax-advantaged investments, partially offset by a $729 million charge related to the redemption of certain trust preferred securities in 2018.

Noninterest expense increased $1.8 billion to $3.7 billion primarily due to the aforementioned $2.1 billion pretax impairment charge.

The income tax benefit was $4.1 billion compared to a benefit of $2.8 billion in 2018. The increase in the tax benefit was primarily driven by the tax effect of the higher pretax loss, the positive impact from the resolution of various tax controversy matters and a higher level of income tax credits. Both years 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 12 – Long-term Debt* and *Note 13 – 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 2019 and 2018, we contributed $135 million and $156 million to the Plans, and we expect to make $128 million of contributions during 2020. The Plans are more fully discussed in *Note 18 – 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 13 – 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 10 includes certain contractual obligations at December 31, 2019 and 2018.

Table 10 Contractual Obligations

	December 31, 2019					December 31 2018
(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	$ 24,151	$ 46,049	$ 47,096	$ 123,560	**$ 240,856**	$ 229,392
Operating lease obligations	1,966	3,265	2,338	4,225	**11,794**	15,770
Purchase obligations	1,272	1,126	401	731	**3,530**	4,048
Time deposits	68,351	4,612	1,463	247	**74,673**	61,039
Other long-term liabilities	1,670	1,056	714	659	**4,099**	3,933
Estimated interest expense on long-term debt and time deposits [1]	5,571	8,073	6,870	23,871	**44,385**	56,852
Total contractual obligations	$ 102,981	$ 64,181	$ 58,882	$ 153,293	**$ 379,337**	$ 371,034

[1] Represents forecasted net interest expense on long-term debt and time deposits based on interest rates at December 31, 2019 and 2018. Forecasts are based on the contractual maturity dates of each liability, and are net of derivative hedges, where applicable.

Representations and Warranties Obligations

For information on representations and warranties obligations in connection with the sale of mortgage loans, see *Note 13 – Commitments and Contingencies* to the Consolidated Financial Statements.

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 53.

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.

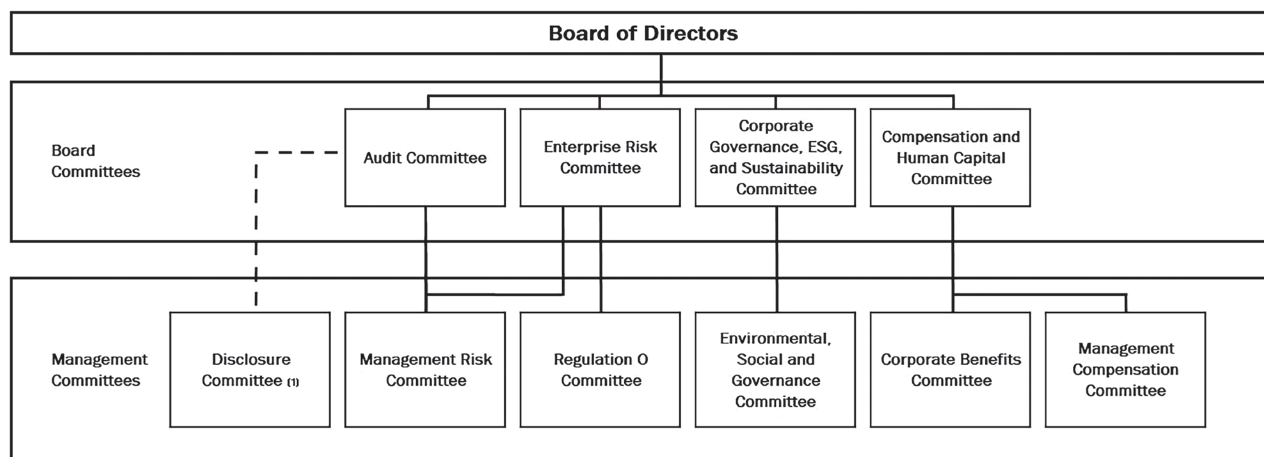
Our lines of business operate with risk limits (which may include credit, market and/or operational limits, as applicable) that align with the Corporation's risk appetite. Executive management is responsible for tracking and reporting performance measurements as well as any exceptions to guidelines or limits. The Board, and its committees when appropriate, oversee 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 66 through 98.

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

Board of Directors and Board Committees

The Board is composed of 17 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 Chief Audit Executive (CAE) 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, ESG, and Sustainability 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 Human Capital 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; reviewing and approving all of our executive officers' compensation, as well as compensation for non-management directors; and reviewing certain other human capital management topics.

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 first, the Chief Financial Officer (CFO) Group; second, Environmental, Social and Governance (ESG), Capital Deployment (CD) and Public Policy (PP); and third, the Chief Administrative Officer (CAO) Group.

Independent Risk Management

IRM is part of our control functions and includes Global Risk Management. 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 CFO Group; ESG, CD and PP; and CAO Group. 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 that cover a specific risk area and vertical CRO teams that cover a particular front line unit or control function. These teams work collaboratively in executing their respective duties.

Corporate Audit

Corporate Audit and the CAE maintain their independence from the FLUs, IRM and other control functions by reporting directly to the Audit Committee or the Board. The CAE 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 is 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 more information, see Business Segment Operations on page 53.

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 Comprehensive Capital Analysis and Review (CCAR) capital plan.

On June 27, 2019, following the Federal Reserve's non-objection to our 2019 CCAR capital plan, the Board authorized the repurchase of approximately $30.9 billion in common stock from July 1, 2019 through June 30, 2020, which includes approximately $900 million to offset shares awarded under equity-based compensation plans during the same period. During 2019, pursuant to the Board's authorizations, including those related to our 2018 CCAR capital plan that expired June 30, 2019, we repurchased $28.1 billion of common stock, which includes common stock repurchases to offset equity-based compensation awards. At December 31, 2019, our remaining stock repurchase authorization was $15.6 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 (Exchange Act).

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's depository institution subsidiaries are also subject to the Prompt Corrective Action (PCA) framework. 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 PCA framework. As of December 31, 2019, the 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.

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 11 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, 2019 and 2018. As of the periods presented herein, the Corporation met the definition of well capitalized under current regulatory requirements.

Table 11 Bank of America Corporation Regulatory Capital under Basel 3

(Dollars in millions, except as noted)	Standardized Approach	Advanced Approaches	Regulatory Minimum (1)
	December 31, 2019		
Risk-based capital metrics:			
Common equity tier 1 capital	**$ 166,760**	**$ 166,760**	
Tier 1 capital	**188,492**	**188,492**	
Total capital (2)	**221,230**	**213,098**	
Risk-weighted assets (in billions)	**1,493**	**1,447**	
Common equity tier 1 capital ratio	**11.2%**	**11.5%**	**9.5%**
Tier 1 capital ratio	**12.6**	**13.0**	**11.0**
Total capital ratio	**14.8**	**14.7**	**13.0**
Leverage-based metrics:			
Adjusted quarterly average assets (in billions) (3)	**$ 2,374**	**$ 2,374**	
Tier 1 leverage ratio	**7.9%**	**7.9%**	**4.0**
SLR leverage exposure (in billions)		**$ 2,946**	
SLR		**6.4%**	**5.0**
	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 (2)	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%
Tier 1 capital ratio	13.2	13.4	9.75
Total capital ratio	15.4	15.1	11.75
Leverage-based metrics:			
Adjusted quarterly average assets (in billions) (3)	$ 2,258	$ 2,258	
Tier 1 leverage ratio	8.4%	8.4%	4.0
SLR leverage exposure (in billions)		$ 2,791	
SLR		6.8%	5.0

(1) The capital conservation buffer and G-SIB surcharge were 2.5 percent at December 31, 2019 and 1.875 percent at December 31, 2018. The countercyclical capital buffer for both periods was zero. The SLR minimum includes a leverage buffer of 2.0 percent.
(2) 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.
(3) Reflects total average assets adjusted for certain Tier 1 capital deductions.

At December 31, 2019, CET1 capital and Total capital under the Advanced approaches were relatively unchanged compared to December 31, 2018. Risk-weighted assets under the Standardized approach, which yielded the lower CET1 capital ratio at December 31, 2019, increased $56.3 billion during 2019 to $1,493 billion primarily due to loan growth and increased client activity in *Global Markets* and *Global Banking*.

Table 12 shows the capital composition at December 31, 2019 and 2018.

Table 12 Capital Composition under Basel 3

(Dollars in millions)	December 31 2019	2018
Total common shareholders' equity	**$ 241,409**	$ 242,999
Goodwill, net of related deferred tax liabilities	**(68,570)**	(68,572)
Deferred tax assets arising from net operating loss and tax credit carryforwards	**(5,193)**	(5,981)
Intangibles, other than mortgage servicing rights and goodwill, net of related deferred tax liabilities	**(1,328)**	(1,294)
Other	**442**	120
Common equity tier 1 capital	**166,760**	167,272
Qualifying preferred stock, net of issuance cost	**22,329**	22,326
Other	**(597)**	(560)
Tier 1 capital	**188,492**	189,038
Tier 2 capital instruments	**22,538**	21,887
Eligible credit reserves included in Tier 2 capital	**2,097**	1,972
Other	**(29)**	(19)
Total capital under the Advanced approaches	**$ 213,098**	$ 212,878

Table 13 shows the components of risk-weighted assets as measured under Basel 3 at December 31, 2019 and 2018.

Table 13 Risk-weighted Assets under Basel 3

	Standardized Approach	Advanced Approaches	Standardized Approach	Advanced Approaches
	December 31			
(Dollars in billions)	2019		2018	
Credit risk	$ 1,437	$ 858	$ 1,384	$ 827
Market risk	56	55	53	52
Operational risk	n/a	500	n/a	500
Risks related to credit valuation adjustments	n/a	34	n/a	30
Total risk-weighted assets	**$ 1,493**	**$ 1,447**	$ 1,437	$ 1,409

n/a = not applicable

Bank of America, N.A. Regulatory Capital

Table 14 presents regulatory capital information for BANA in accordance with Basel 3 Standardized and Advanced approaches as measured at December 31, 2019 and 2018. BANA met the definition of well capitalized under the PCA framework at both year ends.

Table 14 Bank of America, N.A. Regulatory Capital under Basel 3

(Dollars in millions, except as noted)	Standardized Approach	Advanced Approaches	Regulatory Minimum (1)
	December 31, 2019		
Risk-based capital metrics:			
Common equity tier 1 capital	$ 154,626	$ 154,626	
Tier 1 capital	154,626	154,626	
Total capital (2)	166,567	158,665	
Risk-weighted assets (in billions)	1,241	991	
Common equity tier 1 capital ratio	12.5%	15.6%	7.0%
Tier 1 capital ratio	12.5	15.6	8.5
Total capital ratio	13.4	16.0	10.5
Leverage-based metrics:			
Adjusted quarterly average assets (in billions) (3)	$ 1,780	$ 1,780	
Tier 1 leverage ratio	8.7%	8.7%	5.0
SLR leverage exposure (in billions)		$ 2,177	
SLR		7.1%	6.0
	December 31, 2018		
Risk-based capital metrics:			
Common equity tier 1 capital	$ 149,824	$ 149,824	
Tier 1 capital	149,824	149,824	
Total capital (2)	161,760	153,627	
Risk-weighted assets (in billions)	1,195	959	
Common equity tier 1 capital ratio	12.5%	15.6%	6.5%
Tier 1 capital ratio	12.5	15.6	8.0
Total capital ratio	13.5	16.0	10.0
Leverage-based metrics:			
Adjusted quarterly average assets (in billions) (3)	$ 1,719	$ 1,719	
Tier 1 leverage ratio	8.7%	8.7%	5.0
SLR leverage exposure (in billions)		$ 2,112	
SLR		7.1%	6.0

(1) Risk-based capital regulatory minimums at December 31, 2019 are the minimum ratios under Basel 3 including a capital conservation buffer of 2.5 percent. The regulatory minimums for the leverage ratios as of both period ends and risk-based capital ratios as of December 31, 2018 are the percent required to be considered well capitalized under the PCA framework.
(2) 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.
(3) Reflects total average assets adjusted for certain Tier 1 capital deductions.

Total Loss-Absorbing Capacity Requirements

Effective January 1, 2019, the Corporation is subject to the Federal Reserve's final rule requiring G-SIBs to maintain minimum levels of total loss-absorbing capacity (TLAC) and long-term debt. TLAC consists of the Corporation's Tier 1 capital and eligible long-term debt issued directly by the Corporation. Eligible long-term debt for TLAC ratios is comprised of unsecured debt that has a remaining maturity of at least one year and satisfies additional requirements as prescribed in the TLAC final rule. As with the risk-based capital ratios and SLR, the Corporation is required to maintain TLAC ratios in excess of minimum requirements plus applicable buffers to avoid restrictions on capital distributions and discretionary bonus payments. Table 15 presents the Corporation's TLAC and long-term debt ratios and related information as of December 31, 2019.

Table 15 Bank of America Corporation Total Loss-Absorbing Capacity and Long-Term Debt

(Dollars in millions)	TLAC	Regulatory Minimum (1)	Long-term Debt	Regulatory Minimum (2)
	December 31, 2019			
Total eligible balance	$ 367,449		$ 171,349	
Percentage of risk-weighted assets (3)	24.6%	22.0%	11.5%	8.5%
Percentage of SLR leverage exposure	12.5	9.5	5.8	4.5

(1) The TLAC risk-weighted assets regulatory minimum consists of 18.0 percent plus a TLAC risk-weighted assets buffer comprised of 2.5 percent plus the method 1 G-SIB surcharge of 1.5 percent. The countercyclical buffer is zero for this period. The TLAC SLR leverage exposure regulatory minimum consists of 7.5 percent plus a 2.0 percent TLAC leverage buffer. The TLAC risk-weighted assets and leverage buffers must be comprised solely of CET1 capital and Tier 1 capital, respectively.

(2) The long-term debt risk-weighted assets regulatory minimum is comprised of 6.0 percent plus an additional 2.5 percent requirement based on the Corporation's method 2 G-SIB surcharge. The long-term debt leverage exposure regulatory minimum is 4.5 percent.

(3) The approach that yields the higher risk-weighted assets is used to calculate TLAC and long-term debt ratios, which was the Standardized approach as of December 31, 2019.

Regulatory Capital and Securities Regulation

The Corporation's principal U.S. broker-dealer subsidiaries are BofA Securities, Inc. (BofAS), Merrill Lynch Professional Clearing Corp. (MLPCC) and Merrill Lynch, Pierce, Fenner & Smith Incorporated (MLPF&S). BofAS was formed as a result of the reorganization of MLPF&S which was completed in May 2019. The Corporation's principal European broker-dealer subsidiaries are Merrill Lynch International (MLI) and BofA Securities Europe SA (BofASE).

The U.S. broker-dealer subsidiaries are subject to the net capital requirements of Rule 15c3-1 under the Exchange Act. BofAS computes its minimum capital requirements as an alternative net capital broker-dealer under Rule 15c3-1, and MLPCC and MLPF&S compute their minimum capital requirements in accordance with the alternative standard under Rule 15c3-1. BofAS and MLPCC are also registered as futures commission merchants and are subject to U.S. Commodity Futures Trading Commission (CFTC) Regulation 1.17.

BofAS provides institutional services, and in accordance with the alternative net capital requirements, is required to maintain tentative net capital in excess of $1.0 billion and net capital in excess of the greater of $500 million or a certain percentage of its reserve requirement. BofAS must also notify the Securities and Exchange Commission (SEC) in the event its tentative net capital is less than $5.0 billion. BofAS is also required to hold a certain percentage of its risk-based margin in order to meet its CFTC minimum net capital requirement. At December 31, 2019, BofAS had tentative net capital of $12.5 billion. BofAS also had regulatory net capital of $10.4 billion which exceeded the minimum requirement of $2.4 billion.

MLPCC is a fully-guaranteed subsidiary of BofAS and provides clearing and settlement services. At December 31, 2019, MLPCC's regulatory net capital of $5.3 billion exceeded the minimum requirement of $1.3 billion.

MLPF&S provides retail services. At December 31, 2019, MLPF&S' regulatory net capital was $4.1 billion which exceeded the minimum requirement of $102 million.

Our European broker-dealers are regulated by non-U.S. regulators. 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, 2019, MLI's capital resources were $34.8 billion, which exceeded the minimum Pillar 1 requirement of $13.9 billion. BofASE, a French investment firm, is regulated by the Autorité de Contrôle Prudentiel et de Résolution and the Autorité des Marchés Financiers, and is subject to certain regulatory capital requirements. At December 31, 2019, BofASE's capital resources were $5.5 billion which exceeded the minimum Pillar 1 requirement of $1.3 billion.

Regulatory Developments

Revisions to Basel 3 to Address Current Expected Credit Loss Accounting

On January 1, 2020, the Corporation adopted the new accounting standard that requires the measurement of the allowance for credit losses to be based on management's best estimate of lifetime expected credit losses inherent in the Corporation's relevant financial assets. For more information, see *Note 1 - Summary of Significant Accounting Principles* to the Consolidated Financial Statements. Our adoption of the standard resulted in a decrease to the CET1 capital ratio of 17 bps, which will be phased in evenly, or approximately four bps per year, at the beginning of each year from January 1, 2020 through January 1, 2023 in accordance with transition provisions issued by the U.S. banking regulators.

Security-Based Swap Dealer Capital, Margin and Segregation Requirements

On June 21, 2019, the SEC published a final rule establishing capital, margin and segregation requirements for security-based swap dealers (SBSDs). The final rule increases the minimum net capital requirements for broker-dealers authorized to use internal models to compute alternative net capital (ANC broker-dealers). For ANC broker-dealers, the minimum tentative net capital requirement increased from $1.0 billion to $5.0 billion, and the net capital requirement was raised to the greater of $1.0 billion or two percent of the applicable risk-margin amount (initial margin maintained for cleared and non-cleared security-based swaps) plus two percent of certain customer-related assets. For stand-alone SBSDs that use models to calculate haircuts, the minimum tentative net capital requirement is $100 million and the minimum net capital requirement is the greater of $20 million or two percent of the risk-margin amount.

Capital Requirements for Swap Dealers

On December 10, 2019, the CFTC re-opened the comment period on its 2016 proposal to establish capital requirements for swap dealers and major swap participants that are not subject to existing U.S. prudential regulation. Under the proposal, applicable subsidiaries of the Corporation would be permitted to elect one of two approaches to compute their regulatory capital. The first approach is a bank-based capital approach which requires that firms maintain CET1 capital greater than or equal to the larger of 8.0 percent of the entity's RWA as calculated under Basel 3, or 8.0 percent of the margin of the entity's cleared and uncleared swaps, security-based swaps, futures and foreign futures positions. The second approach is based on net liquid assets and requires that a firm maintain net capital greater than or equal to 8.0 percent of the margin as described above. The proposal also includes liquidity and reporting requirements.

Single-Counterparty Credit Limits

The Federal Reserve established 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.

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 63. 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 16 presents average GLS for the three months ended December 31, 2019 and 2018.

Table 16 Average Global Liquidity Sources

(Dollars in billions)	Three Months Ended December 31 2019	2018
Parent company and NB Holdings	**$ 59**	$ 76
Bank subsidiaries	**454**	420
Other regulated entities	**63**	48
Total Average Global Liquidity Sources	**$ 576**	$ 544

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 $372 billion and $344 billion at December 31, 2019 and 2018. 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 17 presents the composition of average GLS for the three months ended December 31, 2019 and 2018.

Table 17 Average Global Liquidity Sources Composition

	Three Months Ended December 31	
(Dollars in billions)	2019	2018
Cash on deposit	$ 103	$ 113
U.S. Treasury securities	98	81
U.S. agency securities and mortgage-backed securities	358	340
Non-U.S. government securities	17	10
Total Average Global Liquidity Sources	$ 576	$ 544

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 $464 billion and $446 billion for the three months ended December 31, 2019 and 2018. For the same periods, the average consolidated LCR was 116 percent and 118 percent. Our LCR fluctuates 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 $1.43 trillion and $1.38 trillion at December 31, 2019 and 2018. 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 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 11 – 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 18 presents our long-term debt by major currency at December 31, 2019 and 2018.

Table 18 Long-term Debt by Major Currency

	December 31	
(Dollars in millions)	2019	2018
U.S. dollar	$ 191,284	$ 180,724
Euro	32,781	34,328
British pound	5,067	5,450
Japanese yen	4,310	3,038
Canadian dollar	3,857	2,936
Australian dollar	1,957	1,722
Other	1,600	1,194
Total long-term debt	**$ 240,856**	$ 229,392

Total long-term debt increased $11.5 billion during 2019, primarily due to debt issuances and valuation adjustments, partially offset by 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.

During 2019, the Corporation issued $52.5 billion of long-term debt consisting of $29.3 billion of notes issued by Bank of America Corporation, substantially all of which was TLAC compliant, $10.9 billion of notes issued by Bank of America, N.A. and $12.3 billion of other debt, substantially all of which was structured liabilities. During 2018, the Corporation issued $64.4 billion of long-term debt consisting of $30.7 billion of notes issued by Bank of America Corporation, substantially all of which was TLAC compliant, $18.7 billion of notes issued by Bank of America, N.A. and $15.0 billion of other debt, substantially all of which was structured liabilities.

During 2019, the Corporation had total long-term debt maturities and redemptions in the aggregate of $50.6 billion consisting of $21.1 billion for Bank of America Corporation, $19.9 billion for Bank of America, N.A. and $9.6 billion of other debt. 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.

At December 31, 2019, Bank of America Corporation's senior notes of $159.8 billion included $107.7 billion of outstanding notes that are both TLAC eligible and callable at least one year before their stated maturities. Of these senior notes, $7.4 billion will be callable and become TLAC ineligible during 2020, and $11.7 billion, $14.8 billion, $10.7 billion and $9.2 billion will do so during each of 2021 through 2024, respectively, and $53.9 billion thereafter.

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 95.

We may issue unsecured debt in the form of structured notes for client purposes, certain of which qualify as TLAC-eligible debt. During 2019, we issued $9.6 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. For more information on long-term debt funding, including issuances and maturities and redemptions, see *Note 12 – Long-term Debt* to the Consolidated Financial Statements.

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 June 12, 2019, Fitch Ratings (Fitch) completed its periodic review of the 12 large, complex securities trading and universal banks, including Bank of America Corporation. The agency affirmed the long-term and short-term senior debt ratings of the Corporation and all of its rated subsidiaries, except Bank of America Merrill Lynch International Designated Activity Company, which Fitch upgraded by one notch to AA-/F1+. The rating outlook for all long-term ratings is currently stable.

On March 6, 2019, Moody's Investors Service (Moody's) upgraded the long-term and short-term ratings of the Corporation by one notch to A2/P-1 from A3/P-2 for senior debt, as well as the long-term ratings of its rated subsidiaries, including BANA, which the agency upgraded to Aa2 from Aa3 for senior debt. Moody's concurrently affirmed the short-term ratings of the Corporation's rated subsidiaries, including BANA. Moody's cited the Corporation's strengthening profitability, continued adherence to a conservative risk profile and stable capital ratios as rationale for the upgrade. The rating outlook for all long-term ratings is currently stable.

The ratings from Standard & Poor's Global Ratings (S&P) for the Corporation and its subsidiaries did not change during 2019. The long-term and short-term debt ratings of BofAS and BofASE, which were initially rated by S&P during the first quarter 2019, also remained unchanged during the rest of 2019.

Table 19 presents the Corporation's current long-term/short-term senior debt ratings and outlooks expressed by the rating agencies.

Table 19 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	A2	P-1	Stable	A-	A-2	Stable	A+	F1	Stable
Bank of America, N.A.	Aa2	P-1	Stable	A+	A-1	Stable	AA-	F1+	Stable
Bank of America Merrill Lynch International Designated Activity Company	NR	NR	NR	A+	A-1	Stable	AA-	F1+	Stable
Merrill Lynch, Pierce, Fenner & Smith Incorporated	NR	NR	NR	A+	A-1	Stable	AA-	F1+	Stable
BofA Securities, Inc.	NR	NR	NR	A+	A-1	Stable	AA-	F1+	Stable
Merrill Lynch International	NR	NR	NR	A+	A-1	Stable	A+	F1	Stable
BofA Securities Europe SA	NR	NR	NR	A+	A-1	Stable	A+	F1	Stable

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 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 72.

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 2019 Annual Report on Form 10-K.

Common Stock Dividends

For a summary of our declared quarterly cash dividends on common stock during 2019 and through February 19, 2020, see *Note 14 – 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 13 – 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 81, Non-U.S. Portfolio on page 87, Provision for Credit Losses on page 89, Allowance for Credit Losses on page 89, 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 2019 resulting in improved credit quality compared to 2018. Net recoveries in the consumer real estate portfolio due primarily to non-core loan sales were partially offset by seasoning in the credit card portfolio compared to 2018.

Improved credit quality and continued loan balance runoff primarily in the non-core consumer real estate portfolio, partially offset by seasoning within the credit card portfolio, drove a $260 million decrease in the consumer allowance for loan and lease losses in 2019 to $4.5 billion. For more information, see Allowance for Credit Losses on page 89.

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

Table 20 presents our outstanding consumer loans and leases, consumer nonperforming loans and accruing consumer loans past due 90 days or more.

Table 20 Consumer Credit Quality

	Outstandings		Nonperforming		Accruing Past Due 90 Days or More	
	December 31					
(Dollars in millions)	**2019**	2018	**2019**	2018	**2019**	2018
Residential mortgage [1]	**$ 236,169**	$ 208,557	**$ 1,470**	$ 1,893	**$ 1,088**	$ 1,884
Home equity	**40,208**	48,286	**536**	1,893	**—**	—
Credit card	**97,608**	98,338	**n/a**	n/a	**1,042**	994
Direct/Indirect consumer [2]	**90,998**	91,166	**47**	56	**33**	38
Other consumer	**192**	202	**—**	—	**—**	—
Consumer loans excluding loans accounted for under the fair value option	**$ 465,175**	$ 446,549	**$ 2,053**	$ 3,842	**$ 2,163**	$ 2,916
Loans accounted for under the fair value option [3]	**594**	682				
Total consumer loans and leases	**$ 465,769**	$ 447,231				
Percentage of outstanding consumer loans and leases [4]	**n/a**	n/a	**0.44%**	0.86%	**0.47%**	0.65%
Percentage of outstanding consumer loans and leases, excluding fully-insured loan portfolios [4]	**n/a**	n/a	**0.46**	0.90	**0.24**	0.24

(1) Residential mortgage loans accruing past due 90 days or more are fully-insured loans. At December 31, 2019 and 2018, residential mortgage includes $740 million and $1.4 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 $348 million and $498 million of loans on which interest was still accruing.

(2) Outstandings primarily include auto and specialty lending loans and leases of $50.4 billion and $50.1 billion, U.S. securities-based lending loans of $36.7 billion and $37.0 billion and non-U.S. consumer loans of $2.8 billion and $2.9 billion at December 31, 2019 and 2018.

(3) Consumer loans accounted for under the fair value option include residential mortgage loans of $257 million and $336 million and home equity loans of $337 million and $346 million at December 31, 2019 and 2018. For more information on the fair value option, see *Note 22 – Fair Value Option* to the Consolidated Financial Statements.

(4) Excludes consumer loans accounted for under the fair value option. At December 31, 2019 and 2018, $6 million and $12 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 21 presents net charge-offs and related ratios for consumer loans and leases.

Table 21 Consumer Net Charge-offs and Related Ratios

(Dollars in millions)	Net Charge-offs 2019	Net Charge-offs 2018	Net Charge-off Ratios [1] 2019	Net Charge-off Ratios [1] 2018
Residential mortgage	$ (47)	$ 28	(0.02)%	0.01%
Home equity	(358)	(2)	(0.81)	—
Credit card	2,948	2,837	3.12	3.00
Direct/Indirect consumer	209	195	0.23	0.21
Other consumer	234	182	n/m	n/m
Total	$ 2,986	$ 3,240	0.66	0.72

(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.
n/m = not meaningful

Table 22 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 22 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 22, outstanding core consumer real estate loans increased $27.3 billion during 2019 driven by an increase of $32.1 billion in residential mortgage, partially offset by a $4.8 billion decrease in home equity.

During 2019, we sold $4.7 billion of consumer real estate loans, primarily non-core, compared to $11.6 billion in 2018.

Table 22 Consumer Real Estate Portfolio [1]

(Dollars in millions)	Outstandings December 31 2019	Outstandings December 31 2018	Nonperforming December 31 2019	Nonperforming December 31 2018	Net Charge-offs 2019	Net Charge-offs 2018
Core portfolio						
Residential mortgage	$ 225,770	$ 193,695	$ 883	$ 1,010	$ 7	$ 11
Home equity	35,226	40,010	363	955	51	78
Total core portfolio	260,996	233,705	1,246	1,965	58	89
Non-core portfolio						
Residential mortgage	10,399	14,862	587	883	(54)	17
Home equity	4,982	8,276	173	938	(409)	(80)
Total non-core portfolio	15,381	23,138	760	1,821	(463)	(63)
Consumer real estate portfolio						
Residential mortgage	236,169	208,557	1,470	1,893	(47)	28
Home equity	40,208	48,286	536	1,893	(358)	(2)
Total consumer real estate portfolio	$ 276,377	$ 256,843	$ 2,006	$ 3,786	$ (405)	$ 26

	Allowance for Loan and Lease Losses December 31 2019	Allowance for Loan and Lease Losses December 31 2018	Provision for Loan and Lease Losses 2019	Provision for Loan and Lease Losses 2018
Core portfolio				
Residential mortgage	$ 229	$ 214	$ 22	$ 7
Home equity	120	228	(58)	(60)
Total core portfolio	349	442	(36)	(53)
Non-core portfolio				
Residential mortgage	96	208	(134)	(104)
Home equity	101	278	(510)	(335)
Total non-core portfolio	197	486	(644)	(439)
Consumer real estate portfolio				
Residential mortgage	325	422	(112)	(97)
Home equity	221	506	(568)	(395)
Total consumer real estate portfolio	$ 546	$ 928	$ (680)	$ (492)

(1) Outstandings and nonperforming loans exclude loans accounted for under the fair value option. Consumer loans accounted for under the fair value option include residential mortgage loans of $257 million and $336 million and home equity loans of $337 million and $346 million at December 31, 2019 and 2018. For more information, see *Note 22 – Fair Value Option* to the Consolidated Financial Statements.

We believe that the presentation of information adjusted to exclude the impact of 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 fully-insured loan portfolio in certain credit quality statistics.

Residential Mortgage

The residential mortgage portfolio made up the largest percentage of our consumer loan portfolio at 51 percent of consumer loans and leases at December 31, 2019. Approximately 50 percent of the residential mortgage portfolio was in *Consumer Banking* and 36 percent was in *GWIM.* The remaining portion was in *All Other* and was comprised of loans used in our overall ALM activities, delinquent FHA loans repurchased pursuant to our servicing agreements with the Government National Mortgage Association as well as loans repurchased related to our representations and warranties.

Outstanding balances in the residential mortgage portfolio increased $27.6 billion in 2019 as retention of new originations was partially offset by loan sales of $2.7 billion and runoff.

At December 31, 2019 and 2018, the residential mortgage portfolio included $18.7 billion and $20.1 billion of outstanding fully-insured loans, of which $11.2 billion and $14.0 billion had FHA insurance with the remainder protected by long-term standby agreements.

Table 23 presents certain residential mortgage key credit statistics on both a reported basis and excluding the fully-insured loan portfolio. The following discussion presents the residential mortgage portfolio excluding the fully-insured loan portfolio.

Table 23 Residential Mortgage – Key Credit Statistics

	Reported Basis [1]		Excluding Fully-insured Loans [1]	
	December 31			
(Dollars in millions)	**2019**	2018	**2019**	2018
Outstandings	**$ 236,169**	$ 208,557	**$ 217,479**	$ 188,427
Accruing past due 30 days or more	**3,108**	3,945	**1,296**	1,155
Accruing past due 90 days or more	**1,088**	1,884	**—**	—
Nonperforming loans	**1,470**	1,893	**1,470**	1,893
Percent of portfolio				
Refreshed LTV greater than 90 but less than or equal to 100	**2%**	2%	**2%**	2%
Refreshed LTV greater than 100	**1**	1	**1**	1
Refreshed FICO below 620	**3**	4	**2**	2
2006 and 2007 vintages [2]	**4**	6	**4**	6

[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 $365 million, or 25 percent, and $536 million, or 28 percent, of nonperforming residential mortgage loans at December 31, 2019 and 2018.

Nonperforming residential mortgage loans decreased $423 million in 2019 primarily driven by sales. Of the nonperforming residential mortgage loans at December 31, 2019, $616 million, or 42 percent, were current on contractual payments. Loans accruing past due 30 days or more increased $141 million.

Net charge-offs improved $75 million to a net recovery of $47 million in 2019 compared to net charge-offs of $28 million in 2018 primarily due to recoveries from the sales of previously charged-off loans and continued improvement in credit quality.

Of the $217.5 billion in total residential mortgage loans outstanding at December 31, 2019, as shown in Table 23, 26 percent were originated as interest-only loans. The outstanding balance of interest-only residential mortgage loans that have entered the amortization period was $7.4 billion, or 13 percent, at December 31, 2019. 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, 2019, $124 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 $1.3 billion, or one percent, for the entire residential mortgage portfolio. In addition, at December 31, 2019, $260 million, or four percent, of outstanding interest-only residential mortgage loans that had entered the amortization period were nonperforming, of which $108 million were contractually current, compared to $1.5 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 94 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 24 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, 2019 and 2018. In the New York area, the New York-Northern New Jersey-Long Island MSA made up 13 percent of outstandings at both December 31, 2019 and 2018.

Table 24 Residential Mortgage State Concentrations

(Dollars in millions)	Outstandings [1]		Nonperforming [1]		Net Charge-offs	
	December 31					
	2019	2018	**2019**	2018	**2019**	2018
California	**$ 88,998**	$ 76,323	**$ 274**	$ 314	**$ (22)**	$ (22)
New York	**22,385**	19,219	**196**	222	**5**	10
Florida	**12,833**	11,624	**143**	221	**(12)**	(6)
Texas	**8,943**	7,820	**65**	102	**1**	4
New Jersey	**8,734**	7,051	**77**	98	**(4)**	8
Other	**75,586**	66,390	**715**	936	**(15)**	34
Residential mortgage loans	**$ 217,479**	$ 188,427	**$ 1,470**	$ 1,893	**$ (47)**	$ 28
Fully-insured loan portfolio	**18,690**	20,130				
Total residential mortgage loan portfolio	**$ 236,169**	$ 208,557				

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

Home Equity

At December 31, 2019, the home equity portfolio made up nine percent of the consumer portfolio and was comprised of home equity lines of credit (HELOCs), home equity loans and reverse mortgages. We no longer originate home equity loans or reverse mortgages.

At December 31, 2019, our HELOC portfolio had an outstanding balance of $37.5 billion, or 93 percent of the total home equity portfolio, compared to $44.3 billion, or 92 percent, at December 31, 2018. HELOCs generally have an initial draw period of 10 years, and after the initial draw period ends, the loans generally convert to 15- or 20-year amortizing loans.

At December 31, 2019, our home equity loan portfolio had an outstanding balance of $1.2 billion, or three percent of the total home equity portfolio, compared to $1.8 billion, or four percent, at December 31, 2018. At December 31, 2019, our reverse mortgage portfolio had an outstanding balance of $1.5 billion, or four percent of the total home equity portfolio, compared to $2.2 billion, also four percent, at December 31, 2018.

At December 31, 2019, 80 percent of the home equity portfolio was in *Consumer Banking*, 12 percent was in *All Other* and the remainder of the portfolio was primarily in *GWIM*. Outstanding balances in the home equity portfolio decreased $8.1 billion in 2019 primarily due to paydowns and loan sales of $2.0 billion outpacing new originations and draws on existing lines. Of the total home equity portfolio at December 31, 2019 and 2018, $15.0 billion, or 37 percent, and $17.3 billion, or 36 percent, were in first-lien positions. At December 31, 2019, 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 $6.9 billion, or 17 percent of our total home equity portfolio.

Unused HELOCs totaled $43.6 billion and $43.1 billion at December 31, 2019 and 2018. The increase was primarily driven by the impact of lower utilization of open lines and new production partially offset by customers choosing to close accounts. The HELOC utilization rate was 46 percent and 51 percent at December 31, 2019 and 2018.

Table 25 presents certain home equity portfolio key credit statistics.

Table 25 Home Equity – Key Credit Statistics [1]

(Dollars in millions)	December 31	
	2019	2018
Outstandings	**$ 40,208**	$ 48,286
Accruing past due 30 days or more [2]	**218**	363
Nonperforming loans [2]	**536**	1,893
Percent of portfolio		
Refreshed CLTV greater than 90 but less than or equal to 100	**1%**	2%
Refreshed CLTV greater than 100	**2**	3
Refreshed FICO below 620	**3**	5
2006 and 2007 vintages [3]	**18**	22

(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 $30 million and $48 million and nonperforming loans include $57 million and $218 million of loans where we serviced the underlying first lien at December 31, 2019 and 2018.
(3) These vintages of loans accounted for 34 percent and 49 percent of nonperforming home equity loans at December 31, 2019 and 2018.

Nonperforming outstanding balances in the home equity portfolio decreased $1.4 billion in 2019 as outflows, primarily sales, outpaced new inflows. Of the nonperforming home equity loans at December 31, 2019, $241 million, or 45 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, $162 million, or 30 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 $145 million in 2019.

Net charge-offs decreased $356 million to a net recovery of $358 million in 2019 compared to a net recovery of $2 million in 2018 primarily driven by recoveries from the sales of previously charged off non-core home equity loans.

Of the $40.2 billion in total home equity portfolio outstandings at December 31, 2019, as shown in Table 25, 17 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 $11.5 billion at December 31, 2019. 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, 2019, $149 million, or one percent, of outstanding HELOCs that had entered the amortization period were accruing past due 30 days or more. In addition, at December 31, 2019, $472 million, or four percent, 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 2019, 13 percent of these customers with an outstanding balance did not pay any principal on their HELOCs.

Table 26 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, 2019 and 2018. The Los Angeles-Long Beach-Santa Ana MSA within California made up 11 percent of the outstanding home equity portfolio at both December 31, 2019 and 2018.

Table 26 Home Equity State Concentrations

	Outstandings [1]		Nonperforming [1]		Net Charge-offs	
	December 31					
(Dollars in millions)	**2019**	2018	**2019**	2018	**2019**	2018
California	**$ 11,232**	$ 13,515	**$ 101**	$ 536	**$ (117)**	$ (54)
Florida	**4,327**	5,418	**71**	315	**(74)**	1
New Jersey	**3,216**	3,871	**56**	150	**(8)**	25
New York	**2,899**	3,590	**85**	194	**(1)**	23
Massachusetts	**2,023**	2,400	**29**	65	**(5)**	5
Other	**16,511**	19,492	**194**	633	**(153)**	(2)
Total home equity loan portfolio	**$ 40,208**	$ 48,286	**$ 536**	$ 1,893	**$ (358)**	$ (2)

[1] Outstandings and nonperforming loans exclude loans accounted for under the fair value option.

Credit Card

At December 31, 2019, 97 percent of the credit card portfolio was managed in *Consumer Banking* with the remainder in *GWIM*. Outstandings in the credit card portfolio decreased $730 million in 2019 to $97.6 billion. In 2019, net charge-offs increased $111 million to $2.9 billion compared to net charge-offs of $2.8 billion in 2018. Credit card loans 30 days or more past due and still accruing interest increased $46 million and loans 90 days or more past due and still accruing interest increased $48 million. These increases were driven by portfolio seasoning.

Unused lines of credit for credit card increased to $336.9 billion at December 31, 2019 from $334.8 billion at December 31, 2018.

Table 27 presents certain state concentrations for the credit card portfolio.

Table 27 Credit Card State Concentrations

	Outstandings		Accruing Past Due 90 Days or More		Net Charge-offs	
	December 31					
(Dollars in millions)	**2019**	2018	**2019**	2018	**2019**	2018
California	**$ 16,135**	$ 16,062	**$ 178**	$ 163	**$ 526**	$ 479
Florida	**9,075**	8,840	**135**	119	**363**	332
Texas	**7,815**	7,730	**93**	84	**241**	224
New York	**5,975**	6,066	**80**	81	**243**	268
Washington	**4,639**	4,558	**26**	24	**71**	63
Other	**53,969**	55,082	**530**	523	**1,504**	1,471
Total credit card portfolio	**$ 97,608**	$ 98,338	**$ 1,042**	$ 994	**$ 2,948**	$ 2,837

Direct/Indirect Consumer

At December 31, 2019, 56 percent of the direct/indirect portfolio was included in *Consumer Banking* (consumer auto and specialty lending – automotive, recreational vehicle, marine, aircraft and consumer personal loans) and 44 percent was included in *GWIM* (principally securities-based lending loans).

Outstandings of $91.0 billion in the direct/indirect portfolio were relatively unchanged at December 31, 2019.

Table 28 presents certain state concentrations for the direct/indirect consumer loan portfolio.

Table 28 Direct/Indirect State Concentrations

(Dollars in millions)	Outstandings		Accruing Past Due 90 Days or More		Net Charge-offs	
	December 31					
	2019	2018	2019	2018	2019	2018
California	$ 11,912	$ 11,734	$ 4	$ 4	$ 49	$ 21
Florida	10,154	10,240	4	4	27	36
Texas	9,516	9,876	5	6	29	30
New York	6,394	6,296	1	2	12	9
New Jersey	3,468	3,308	1	1	4	2
Other	49,554	49,712	18	21	88	97
Total direct/indirect loan portfolio	$ 90,998	$ 91,166	$ 33	$ 38	$ 209	$ 195

Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

Table 29 presents nonperforming consumer loans, leases and foreclosed properties activity during 2019 and 2018. During 2019, nonperforming consumer loans decreased $1.8 billion to $2.1 billion primarily driven by loan sales of $1.5 billion.

At December 31, 2019, $606 million, 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, 2019, $901 million, or 44 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 decreased $15 million in 2019 to $229 million as liquidations outpaced additions.

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 are included in Table 29.

Table 29 Nonperforming Consumer Loans, Leases and Foreclosed Properties Activity

(Dollars in millions)	2019	2018
Nonperforming loans and leases, January 1	$ 3,842	$ 5,166
Additions	1,407	2,440
Reductions:		
Paydowns and payoffs	(701)	(958)
Sales	(1,523)	(969)
Returns to performing status [1]	(766)	(1,283)
Charge-offs	(111)	(401)
Transfers to foreclosed properties	(95)	(151)
Transfers to loans held-for-sale	—	(2)
Total net reductions to nonperforming loans and leases	(1,789)	(1,324)
Total nonperforming loans and leases, December 31	2,053	3,842
Foreclosed properties, December 31 [2]	229	244
Nonperforming consumer loans, leases and foreclosed properties, December 31	$ 2,282	$ 4,086
Nonperforming consumer loans and leases as a percentage of outstanding consumer loans and leases [3]	0.44%	0.86%
Nonperforming consumer loans, leases and foreclosed properties as a percentage of outstanding consumer loans, leases and foreclosed properties [3]	0.49	0.92

(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 $260 million and $488 million at December 31, 2019 and 2018.
(3) Outstanding consumer loans and leases exclude loans accounted for under the fair value option.

Table 30 presents TDRs for the consumer real estate portfolio. Performing TDR balances are excluded from nonperforming loans and leases in Table 29.

Table 30 Consumer Real Estate Troubled Debt Restructurings

(Dollars in millions)	December 31, 2019			December 31, 2018		
	Nonperforming	Performing	Total	Nonperforming	Performing	Total
Residential mortgage [1, 2]	$ 921	$ 3,832	$ 4,753	$ 1,209	$ 4,988	$ 6,197
Home equity [3]	252	977	1,229	1,107	1,252	2,359
Total consumer real estate troubled debt restructurings	$ 1,173	$ 4,809	$ 5,982	$ 2,316	$ 6,240	$ 8,556

(1) At December 31, 2019 and 2018, residential mortgage TDRs deemed collateral dependent totaled $1.2 billion and $1.6 billion, and included $748 million and $960 million of loans classified as nonperforming and $468 million and $605 million of loans classified as performing.
(2) At December 31, 2019 and 2018, residential mortgage performing TDRs include $2.1 billion and $2.8 billion of loans that were fully-insured.
(3) At December 31, 2019 and 2018, home equity TDRs deemed collateral dependent totaled $442 million and $1.3 billion, and include $209 million and $961 million of loans classified as nonperforming and $233 million and $322 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 29 as substantially all of the loans remain on accrual status until either charged off or paid in full. At December 31, 2019 and 2018, our renegotiated TDR portfolio was $679 million and $566 million, of which $570 million and $481 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 35, 38 and 41 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 85 and Table 38.

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 more information, see *Note 13 – Commitments and Contingencies* to the Consolidated Financial Statements.

Commercial Credit Portfolio

During 2019, credit quality among large corporate and middle-market borrowers in our commercial and industrial portfolio remained strong. Credit quality of commercial real estate borrowers in most sectors remained stable with conservative LTV ratios. However, some of the real estate markets experienced slowing tenant demand and decelerating rental income.

Total commercial utilized credit exposure increased $14.3 billion in 2019 to $635.3 billion driven by higher loans and leases. The utilization rate for loans and leases, SBLCs and financial guarantees, and commercial letters of credit, in the aggregate, was 58 percent at December 31, 2019 and 59 percent at December 31, 2018.

Table 31 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 31 Commercial Credit Exposure by Type

(Dollars in millions)	Commercial Utilized (1) 2019	Commercial Utilized (1) 2018	Commercial Unfunded (2, 3, 4) 2019	Commercial Unfunded (2, 3, 4) 2018	Total Commercial Committed 2019	Total Commercial Committed 2018
	December 31					
Loans and leases	$ 517,657	$ 499,664	$ 405,834	$ 369,282	$ 923,491	$ 868,946
Derivative assets (5)	40,485	43,725	—	—	40,485	43,725
Standby letters of credit and financial guarantees	36,062	34,941	468	491	36,530	35,432
Debt securities and other investments	25,546	25,425	5,101	4,250	30,647	29,675
Loans held-for-sale	7,047	9,090	15,135	14,812	22,182	23,902
Operating leases	6,660	6,060	—	—	6,660	6,060
Commercial letters of credit	1,049	1,210	451	168	1,500	1,378
Other	800	898	—	—	800	898
Total	**$ 635,306**	$ 621,013	**$ 426,989**	$ 389,003	**$ 1,062,295**	$ 1,010,016

(1) Commercial utilized exposure includes loans of $7.7 billion and $3.7 billion and issued letters of credit with a notional amount of $170 million and $100 million accounted for under the fair value option at December 31, 2019 and 2018.
(2) Commercial unfunded exposure includes commitments accounted for under the fair value option with a notional amount of $4.2 billion and $3.0 billion at December 31, 2019 and 2018.
(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 $10.6 billion and $10.7 billion at December 31, 2019 and 2018.
(5) Derivative assets are carried at fair value, reflect the effects of legally enforceable master netting agreements and have been reduced by cash collateral of $33.9 billion and $32.4 billion at December 31, 2019 and 2018. Not reflected in utilized and committed exposure is additional non-cash derivative collateral held of $35.2 billion and $33.0 billion at December 31, 2019 and 2018, which consists primarily of other marketable securities.

Outstanding commercial loans and leases increased $18.0 billion during 2019 primarily in the commercial and industrial portfolio. Nonperforming commercial loans increased $397 million and commercial reservable criticized utilized exposure increased $391 million driven by a small number of client downgrades across industries which were not indicative of broader issues in the portfolio. The allowance for loan and lease losses for the commercial portfolio increased $75 million to $4.9 billion at December 31, 2019. For more information, see Allowance for Credit Losses on page 89. Table 32 presents our commercial loans and leases portfolio and related credit quality information at December 31, 2019 and 2018.

Table 32 Commercial Credit Quality

(Dollars in millions)	Outstandings 2019	Outstandings 2018	Nonperforming 2019	Nonperforming 2018	Accruing Past Due 90 Days or More 2019	Accruing Past Due 90 Days or More 2018
	December 31					
Commercial and industrial:						
U.S. commercial	$ 307,048	$ 299,277	$ 1,094	$ 794	$ 106	$ 197
Non-U.S. commercial	104,966	98,776	43	80	8	—
Total commercial and industrial	412,014	398,053	1,137	874	114	197
Commercial real estate	62,689	60,845	280	156	19	4
Commercial lease financing	19,880	22,534	32	18	20	29
	494,583	481,432	1,449	1,048	153	230
U.S. small business commercial (1)	15,333	14,565	50	54	97	84
Commercial loans excluding loans accounted for under the fair value option	509,916	495,997	1,499	1,102	250	314
Loans accounted for under the fair value option (2)	7,741	3,667	—	—	—	—
Total commercial loans and leases	**$ 517,657**	$ 499,664	**$ 1,499**	$ 1,102	**$ 250**	$ 314

(1) Includes card-related products.
(2) Commercial loans accounted for under the fair value option include U.S. commercial of $4.7 billion and $2.5 billion and non-U.S. commercial of $3.1 billion and $1.1 billion at December 31, 2019 and 2018. For more information on the fair value option, see *Note 22 – Fair Value Option* to the Consolidated Financial Statements.

Table 33 presents net charge-offs and related ratios for our commercial loans and leases for 2019 and 2018.

Table 33 Commercial Net Charge-offs and Related Ratios

(Dollars in millions)	Net Charge-offs 2019	Net Charge-offs 2018	Net Charge-off Ratios (1) 2019	Net Charge-off Ratios (1) 2018
Commercial and industrial:				
U.S. commercial	$ 256	$ 215	0.08%	0.07%
Non-U.S. commercial	84	68	0.08	0.07
Total commercial and industrial	340	283	0.08	0.07
Commercial real estate	29	1	0.05	—
Commercial lease financing	21	(1)	0.10	(0.01)
	390	283	0.08	0.06
U.S. small business commercial	272	240	1.83	1.70
Total commercial	**$ 662**	$ 523	**0.13**	0.11

(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 34 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. At December 31, 2019 and 2018, 90 percent and 91 percent of commercial reservable criticized utilized exposure was secured.

Table 34 Commercial Reservable Criticized Utilized Exposure [1, 2]

	December 31			
(Dollars in millions)	2019		2018	
Commercial and industrial:				
U.S. commercial	**$ 8,272**	**2.46%**	$ 7,986	2.43%
Non-U.S. commercial	**989**	**0.89**	1,013	0.97
Total commercial and industrial	**9,261**	**2.07**	8,999	2.08
Commercial real estate	**1,129**	**1.75**	936	1.50
Commercial lease financing	**329**	**1.66**	366	1.62
	10,719	**2.01**	10,301	1.99
U.S. small business commercial	**733**	**4.78**	760	5.22
Total commercial reservable criticized utilized exposure [1]	**$ 11,452**	**2.09**	$ 11,061	2.08

(1) Total commercial reservable criticized utilized exposure includes loans and leases of $10.7 billion and $10.3 billion and commercial letters of credit of $715 million and $781 million at December 31, 2019 and 2018.

(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, 2019, 70 percent of the U.S. commercial loan portfolio, excluding small business, was managed in *Global Banking,* 16 percent in *Global Markets*, 13 percent in *GWIM* (generally business-purpose loans for high net worth clients) and the remainder primarily in *Consumer Banking*. U.S. commercial loans increased $7.8 billion during 2019, across lines of business.

Non-U.S. Commercial

At December 31, 2019, 83 percent of the non-U.S. commercial loan portfolio was managed in *Global Banking* and 17 percent in *Global Markets*. Non-U.S. commercial loans increased $6.2 billion during 2019, primarily in *Global Banking*. For information on the non-U.S. commercial portfolio, see Non-U.S. Portfolio on page 87.

Commercial Real Estate

Commercial real estate primarily includes commercial loans 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. Outstanding loans increased $1.8 billion, or three percent, during 2019 to $62.7 billion due to new originations slightly outpacing paydowns. The portfolio remains diversified across property types and geographic regions. California represented the largest state concentration at 24 percent and 23 percent of the commercial real estate portfolio at December 31, 2019 and 2018. 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.

During 2019, 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.

Table 35 presents outstanding commercial real estate loans by geographic region, based on the geographic location of the collateral, and by property type.

Table 35 Outstanding Commercial Real Estate Loans

(Dollars in millions)	December 31 2019	2018
By Geographic Region		
California	$ 14,910	$ 14,002
Northeast	12,408	10,895
Southwest	8,408	7,339
Southeast	5,937	5,726
Florida	3,984	3,680
Illinois	3,349	2,989
Midwest	3,203	3,772
Midsouth	2,468	2,919
Northwest	1,638	2,178
Non-U.S.	3,724	4,240
Other [1]	2,660	3,105
Total outstanding commercial real estate loans	$ 62,689	$ 60,845
By Property Type		
Non-residential		
Office	$ 17,902	$ 17,246
Industrial / Warehouse	8,677	5,379
Shopping centers / Retail	8,183	8,798
Multi-family rental	7,250	7,762
Hotels / Motels	6,982	7,248
Unsecured	3,438	2,956
Multi-use	1,788	2,848
Other	6,958	7,029
Total non-residential	61,178	59,266
Residential	1,511	1,579
Total outstanding commercial real estate loans	$ 62,689	$ 60,845

(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 52 percent and 51 percent of the U.S. small business commercial portfolio at December 31, 2019 and 2018. Of the U.S. small business commercial net charge-offs, 94 percent and 95 percent were credit card-related products in 2019 and 2018.

Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity

Table 36 presents the nonperforming commercial loans, leases and foreclosed properties activity during 2019 and 2018. Nonperforming loans do not include loans accounted for under the fair value option. During 2019, nonperforming commercial loans and leases increased $397 million to $1.5 billion. At December 31, 2019, 94 percent of commercial nonperforming loans, leases and foreclosed properties were secured and 64 percent were contractually current. Commercial nonperforming loans were carried at 88 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 36 Nonperforming Commercial Loans, Leases and Foreclosed Properties Activity [1, 2]

(Dollars in millions)	2019	2018
Nonperforming loans and leases, January 1	$ 1,102	$ 1,304
Additions	2,048	1,415
Reductions:		
Paydowns	(648)	(771)
Sales	(215)	(210)
Returns to performing status [3]	(120)	(246)
Charge-offs	(478)	(361)
Transfers to foreclosed properties	(9)	(12)
Transfers to loans held-for-sale	(181)	(17)
Total net reductions to nonperforming loans and leases	397	(202)
Total nonperforming loans and leases, December 31	1,499	1,102
Foreclosed properties, December 31	56	56
Nonperforming commercial loans, leases and foreclosed properties, December 31	$ 1,555	$ 1,158
Nonperforming commercial loans and leases as a percentage of outstanding commercial loans and leases [4]	0.29%	0.22%
Nonperforming commercial loans, leases and foreclosed properties as a percentage of outstanding commercial loans, leases and foreclosed properties [4]	0.30	0.23

(1) Balances do not include nonperforming loans held-for-sale of $239 million and $292 million at December 31, 2019 and 2018.
(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 37 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 37 Commercial Troubled Debt Restructurings

	December 31, 2019			December 31, 2018		
(Dollars in millions)	Nonperforming	Performing	Total	Nonperforming	Performing	Total
Commercial and industrial:						
U.S. commercial	$ 617	$ 999	$ 1,616	$ 306	$ 1,092	$ 1,398
Non-U.S. commercial	41	193	234	78	162	240
Total commercial and industrial	658	1,192	1,850	384	1,254	1,638
Commercial real estate	212	14	226	114	6	120
Commercial lease financing	18	31	49	3	68	71
	888	1,237	2,125	501	1,328	1,829
U.S. small business commercial	—	27	27	3	18	21
Total commercial troubled debt restructurings	$ 888	$ 1,264	$ 2,152	$ 504	$ 1,346	$ 1,850

Industry Concentrations

Table 38 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 $52.3 billion, or five percent, during 2019 to $1.1 trillion. The increase in commercial committed exposure was concentrated in the Real estate, Utilities and Finance companies industry sectors. Increases were partially offset by decreased exposure to the Pharmaceuticals and biotechnology, Technology hardware and equipment, and Government and public education 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 $110.0 billion, increased $2.1 billion, or two percent, during 2019.

Real estate, our second largest industry concentration with committed exposure of $96.3 billion, increased $9.8 billion, or 11 percent, during 2019. This growth occurred primarily in the category of industrial and warehouse buildings, partially offset by declines in REITs.

Capital goods, our third largest industry concentration with committed exposure of $80.9 billion, increased $5.8 billion, or eight percent, during 2019 with the growth largely occurring in the trading companies and distributors industry categories, partially offset by a decrease in industrial conglomerates. For more information on the commercial real estate and related portfolios, see Commercial Portfolio Credit Risk Management – Commercial Real Estate on page 83.

Table 38 Commercial Credit Exposure by Industry (1)

	Commercial Utilized		Total Commercial Committed (2)	
	December 31			
(Dollars in millions)	2019	2018	2019	2018
Asset managers and funds	$ 71,289	$ 71,756	$ 109,972	$ 107,888
Real estate (3)	70,341	65,328	96,349	86,514
Capital goods	41,060	39,192	80,871	75,080
Finance companies	40,171	36,662	63,940	56,659
Healthcare equipment and services	34,353	35,763	55,918	56,489
Government and public education	41,889	43,675	53,566	54,749
Materials	26,663	27,347	52,128	51,865
Consumer services	28,434	25,702	49,071	43,298
Retailing	25,868	25,333	48,317	47,507
Food, beverage and tobacco	24,163	23,586	45,956	42,745
Commercial services and supplies	23,102	22,623	38,943	39,349
Energy	16,407	13,727	36,327	32,279
Utilities	12,383	12,035	36,060	27,623
Transportation	23,448	22,814	33,027	31,523
Global commercial banks	26,492	26,583	28,670	28,627
Individuals and trusts	18,926	18,643	27,815	25,019
Technology hardware and equipment	10,645	13,014	24,071	26,228
Media	12,429	12,132	23,629	24,502
Vehicle dealers	18,013	17,603	21,435	20,446
Consumer durables and apparel	10,193	9,904	21,245	20,199
Software and services	10,432	8,809	20,556	19,172
Pharmaceuticals and biotechnology	5,962	7,430	20,203	23,634
Telecommunication services	9,144	8,686	16,103	14,166
Insurance	6,669	8,674	15,214	15,807
Automobiles and components	7,345	7,131	14,910	13,893
Financial markets infrastructure (clearinghouses)	9,351	8,317	11,851	10,042
Food and staples retailing	6,290	4,787	10,392	9,093
Religious and social organizations	3,844	3,757	5,756	5,620
Total commercial credit exposure by industry	$ 635,306	$ 621,013	$ 1,062,295	$ 1,010,016
Net credit default protection purchased on total commitments (4)			$ (3,349)	$ (2,663)

(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 $10.6 billion and $10.7 billion at December 31, 2019 and 2018.

(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 to hedge funded and unfunded exposures for which we elected the fair value option, as well as certain other credit exposures. For more 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, 2019 and 2018, 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 $3.3 billion and $2.7 billion. We recorded net losses of $145 million in 2019 compared to net losses of $2 million in 2018 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 45. For more information, see Trading Risk Management on page 93.

Tables 39 and 40 present the maturity profiles and the credit exposure debt ratings of the net credit default protection portfolio at December 31, 2019 and 2018.

Table 39 Net Credit Default Protection by Maturity

	December 31	
	2019	2018
Less than or equal to one year	54%	20%
Greater than one year and less than or equal to five years	45	78
Greater than five years	1	2
Total net credit default protection	100%	100%

Table 40 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)	2019		2018	
Ratings [2, 3]				
A	$ (697)	20.8%	$ (700)	26.3%
BBB	(1,089)	32.5	(501)	18.8
BB	(766)	22.9	(804)	30.2
B	(373)	11.1	(422)	15.8
CCC and below	(119)	3.6	(205)	7.7
NR [4]	(305)	9.1	(31)	1.2
Total net credit default protection	$ (3,349)	100.0%	$ (2,663)	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 41 presents our 20 largest non-U.S. country exposures at December 31, 2019. These exposures accounted for 88 percent and 89 percent of our total non-U.S. exposure at December 31, 2019 and 2018. Net country exposure for these 20 countries increased $8.5 billion in 2019, primarily driven by increased sovereign and corporate exposure across multiple countries.

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 41 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 2019	Hedges and Credit Default Protection	**Net Country Exposure at December 31 2019**	Increase (Decrease) from December 31 2018
United Kingdom	$ 29,156	$ 17,341	$ 7,800	$ 3,545	$ 57,842	$ (1,998)	**$ 55,844**	$ 990
Germany	21,920	7,408	1,828	1,967	33,123	(2,295)	**30,828**	2,171
Canada	7,967	8,255	1,690	2,879	20,791	(669)	**20,122**	607
France	7,243	9,208	876	969	18,296	(2,041)	**16,255**	3,604
China	13,304	497	1,085	949	15,835	(248)	**15,587**	946
India	7,817	364	398	3,660	12,239	(222)	**12,017**	905
Brazil	7,393	716	218	3,683	12,010	(238)	**11,772**	1,523
Australia	6,100	3,583	415	1,443	11,541	(439)	**11,102**	1,172
Japan	8,450	896	1,002	1,589	11,937	(1,405)	**10,532**	(9,491)
Netherlands	6,322	3,585	330	876	11,113	(786)	**10,327**	(1,250)
South Korea	5,981	758	386	1,762	8,887	(182)	**8,705**	(465)
Singapore	3,749	435	172	3,528	7,884	(58)	**7,826**	2,309
Mexico	4,190	1,733	224	1,814	7,961	(150)	**7,811**	1,575
Switzerland	4,387	2,947	213	325	7,872	(487)	**7,385**	(379)
Hong Kong	5,106	353	434	1,194	7,087	(31)	**7,056**	(180)
Belgium	5,077	1,259	526	159	7,021	(514)	**6,507**	929
Italy	2,353	2,303	510	1,386	6,552	(1,175)	**5,377**	2,296
Spain	3,153	1,073	258	867	5,351	(629)	**4,722**	72
United Arab Emirates	3,267	229	119	10	3,625	(38)	**3,587**	(62)
Ireland	2,142	979	76	201	3,398	(31)	**3,367**	1,206
Total top 20 non-U.S. countries exposure	$ 155,077	$ 63,922	$ 18,560	$ 32,806	$ 270,365	$ (13,636)	**$ 256,729**	$ 8,478

A number of economic conditions and geopolitical events have given rise to risk aversion in certain emerging markets. Additionally, in light of ongoing trade tensions, we continue to closely monitor our exposures to tariff-sensitive regions and industries, particularly to countries that account for a large percentage of U.S. trade, such as China.

Our largest emerging market country exposure at December 31, 2019 was China, with net exposure of $15.6 billion, concentrated in large state-owned companies, subsidiaries of multinational corporations and commercial banks.

The economic performance in the EU remains uncertain, including as a result of the uncertainty surrounding the terms of a potential trade agreement and other terms associated with the future relationship between the U.K. and the EU, which could weigh unevenly on the economic performance of EU countries generally, and even more heavily on that of the U.K. For more information, see Item 1A. Risk Factors of our 2019 Annual Report on Form 10-K and Executive Summary – Recent Developments – U.K. Exit from the EU on page 44. Our largest EU country exposure at December 31, 2019 was the U.K. with net exposure of $55.8 billion, which represents a $990 million increase from December 31, 2018. Our second largest EU exposure was Germany with net exposure of $30.8 billion as of December 31, 2019, which represents a $2.2 billion increase from December 31, 2018. The increase in Germany was primarily driven by an increase in sovereign exposure.

Table 42 presents countries that had total cross-border exposure, including the notional amount of cash loaned under secured financing agreements, exceeding one percent of our total assets at December 31, 2019. Local exposure, defined as exposure booked in local offices of a respective country with clients in the same country, is excluded. At December 31, 2019, the U.K. and France were the only countries where their respective total cross-border exposures exceeded one percent of our total assets. At December 31, 2019, Germany had total cross-border exposure of $19.4 billion representing 0.80 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, 2019.

Table 42 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	**2019**	**$ 1,859**	**$ 3,580**	**$ 93,232**	**$ 98,671**	**4.05%**
	2018	1,505	3,458	46,191	51,154	2.17
	2017	923	2,984	47,205	51,112	2.24
France	**2019**	**736**	**2,473**	**23,172**	**26,381**	**1.08**
	2018	633	2,385	29,847	32,865	1.40
	2017	2,964	1,521	27,903	32,388	1.42

Provision for Credit Losses

The provision for credit losses increased $308 million to $3.6 billion in 2019 compared to 2018. The provision for credit losses was $58 million lower than net charge-offs for 2019, resulting in a decrease in the allowance for credit losses. This compared to a decrease of $481 million in the allowance for credit losses in 2018. Net charge-offs in 2019 were $3.6 billion compared to $3.8 billion in 2018.

The provision for credit losses for the consumer portfolio decreased $117 million to $2.8 billion in 2019 compared to 2018. The decrease was primarily driven by consumer real estate loan sales.

The provision for credit losses for the commercial portfolio, including unfunded lending commitments, increased $425 million to $758 million in 2019 compared to 2018. The increase was due in part to energy reserve releases in the prior-year periods.

Assuming a stable economic environment in 2020 compared to the end of 2019, we expect net charge-offs of approximately $1 billion per quarter in 2020. In view of the newly adopted accounting standard on the measurement of the allowance for credit losses, we expect the provision for credit losses to be modestly higher than net charge-offs in 2020, assuming no change in the current economic outlook and estimates of loan growth, including product mix. For more information regarding the new accounting standard, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

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 and small business credit card 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, credit scores and the amount of loss in the event of default. 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 combined loan-to-value (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, 2019, the loss forecast process resulted in reductions in the allowance related to the residential mortgage and home equity portfolios compared to December 31, 2018.

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, 2019, the allowance for the commercial real estate portfolio increased compared to December 31, 2018.

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.

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 43, was $4.5 billion at December 31, 2019, a decrease of $260 million from December 31, 2018. The decrease was primarily in the consumer real estate portfolio, partially offset by an increase in the credit card portfolio. The

reduction in the allowance for the consumer real estate portfolio was driven by improved credit quality, a decrease in loan balances in our non-core portfolio, proactive credit risk management initiatives and high credit quality originations. The improved credit quality was impacted by continuing improvements in the U.S. economy and strong labor markets evidenced by low levels of unemployment and increases in home prices. Nonperforming consumer loans decreased $1.8 billion during 2019 as loan sales, returns to performing status and paydowns continued to outpace additions. The increase in allowance for the credit card portfolio was primarily driven by continued portfolio seasoning.

The allowance for loan and lease losses for the commercial portfolio, as presented in Table 43, was $4.9 billion at December 31, 2019, an increase of $75 million from December 31, 2018. Commercial reservable criticized utilized exposure increased to $11.5 billion at December 31, 2019 from $11.1 billion (to 2.09 percent from 2.08 percent of total commercial reservable utilized exposure) at December 31, 2018, and nonperforming commercial loans increased to $1.5 billion at December 31, 2019 from $1.1 billion (to 0.29 percent from 0.22 percent of outstanding commercial loans excluding loans accounted for under the fair value option) at December 31, 2018 with the increases spread across multiple industries. See Tables 32, 33 and 34 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 0.97 percent at December 31, 2019 compared to 1.02 percent at December 31, 2018.

On January 1, 2020, the Corporation adopted the new accounting standard that requires the measurement of the allowance for credit losses to be based on management's best estimate of lifetime expected credit losses inherent in the Corporation's relevant financial assets. Upon adoption of the standard on January 1, 2020, the Corporation recorded a $3.3 billion, or 32 percent, increase to the allowance for credit losses. After adjusting for deferred taxes and other adoption effects, a $2.4 billion decrease was recorded in retained earnings through a cumulative-effect adjustment. For more information regarding this new accounting standard, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

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 $813 million at December 31, 2019 compared to $797 million at December 31, 2018.

Table 43 Allocation of the Allowance for Credit Losses by Product Type

(Dollars in millions)	Amount	Percent of Total	Percent of Loans and Leases Outstanding (1)	Amount	Percent of Total	Percent of Loans and Leases Outstanding (1)
	December 31, 2019			December 31, 2018		
Allowance for loan and lease losses						
Residential mortgage	**$ 325**	**3.45%**	**0.14%**	$ 422	4.40%	0.20%
Home equity	**221**	**2.35**	**0.55**	506	5.27	1.05
Credit card	**3,710**	**39.39**	**3.80**	3,597	37.47	3.66
Direct/Indirect consumer	**234**	**2.49**	**0.26**	248	2.58	0.27
Other consumer	**52**	**0.55**	**n/m**	29	0.30	n/m
Total consumer	**4,542**	**48.23**	**0.98**	4,802	50.02	1.08
U.S. commercial (2)	**3,015**	**32.02**	**0.94**	3,010	31.35	0.96
Non-U.S. commercial	**658**	**6.99**	**0.63**	677	7.05	0.69
Commercial real estate	**1,042**	**11.07**	**1.66**	958	9.98	1.57
Commercial lease financing	**159**	**1.69**	**0.80**	154	1.60	0.68
Total commercial	**4,874**	**51.77**	**0.96**	4,799	49.98	0.97
Allowance for loan and lease losses	**9,416**	**100.00%**	**0.97**	9,601	100.00%	1.02
Reserve for unfunded lending commitments	**813**			797		
Allowance for credit losses	**$ 10,229**			$ 10,398		

(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 $257 million and $336 million and home equity loans of $337 million and $346 million at December 31, 2019 and 2018. Commercial loans accounted for under the fair value option include U.S. commercial loans of $4.7 billion and $2.5 billion and non-U.S. commercial loans of $3.1 billion and $1.1 billion at December 31, 2019 and 2018.

(2) Includes allowance for loan and lease losses for U.S. small business commercial loans of $523 million and $474 million at December 31, 2019 and 2018.

n/m = not meaningful

Table 44 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 2019 and 2018.

Table 44 Allowance for Credit Losses

(Dollars in millions)	2019	2018
Allowance for loan and lease losses, January 1	**$ 9,601**	$ 10,393
Loans and leases charged off		
Residential mortgage	**(93)**	(207)
Home equity	**(429)**	(483)
Credit card	**(3,535)**	(3,345)
Direct/Indirect consumer	**(518)**	(495)
Other consumer	**(249)**	(197)
Total consumer charge-offs	**(4,824)**	(4,727)
U.S. commercial [1]	**(650)**	(575)
Non-U.S. commercial	**(115)**	(82)
Commercial real estate	**(31)**	(10)
Commercial lease financing	**(26)**	(8)
Total commercial charge-offs	**(822)**	(675)
Total loans and leases charged off	**(5,646)**	(5,402)
Recoveries of loans and leases previously charged off		
Residential mortgage	**140**	179
Home equity	**787**	485
Credit card	**587**	508
Direct/Indirect consumer	**309**	300
Other consumer	**15**	15
Total consumer recoveries	**1,838**	1,487
U.S. commercial [2]	**122**	120
Non-U.S. commercial	**31**	14
Commercial real estate	**2**	9
Commercial lease financing	**5**	9
Total commercial recoveries	**160**	152
Total recoveries of loans and leases previously charged off	**1,998**	1,639
Net charge-offs	**(3,648)**	(3,763)
Provision for loan and lease losses	**3,574**	3,262
Other [3]	**(111)**	(291)
Allowance for loan and lease losses, December 31	**9,416**	9,601
Reserve for unfunded lending commitments, January 1	**797**	777
Provision for unfunded lending commitments	**16**	20
Reserve for unfunded lending commitments, December 31	**813**	797
Allowance for credit losses, December 31	**$ 10,229**	$ 10,398
Loan and allowance ratios:		
Loans and leases outstanding at December 31 [4]	**$ 975,091**	$ 942,546
Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [4]	**0.97%**	1.02%
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [5]	**0.98**	1.08
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [6]	**0.96**	0.97
Average loans and leases outstanding [4]	**$ 951,583**	$ 927,531
Net charge-offs as a percentage of average loans and leases outstanding [4]	**0.38%**	0.41%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31	**265**	194
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs	**2.58**	2.55
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [7]	**$ 4,151**	$ 4,031
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]	**148%**	113%

(1) Includes U.S. small business commercial charge-offs of $320 million and $287 million in 2019 and 2018.
(2) Includes U.S. small business commercial recoveries of $48 million and $47 million in 2019 and 2018.
(3) Primarily represents write-offs of purchased credit-impaired (PCI) loans, the net impact of portfolio sales, and transfers to loans held-for-sale.
(4) Outstanding loan and lease balances and ratios do not include loans accounted for under the fair value option of $8.3 billion and $4.3 billion at December 31, 2019 and 2018. Average loans accounted for under the fair value option were $6.8 billion and $5.5 billion in 2019 and 2018.
(5) Excludes consumer loans accounted for under the fair value option of $594 million and $682 million at December 31, 2019 and 2018.
(6) Excludes commercial loans accounted for under the fair value option of $7.7 billion and $3.7 billion at December 31, 2019 and 2018.
(7) Primarily includes amounts allocated to credit card and unsecured consumer lending portfolios in *Consumer Banking*.

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 95.

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.

Model risk is the potential for adverse consequences from decisions based on incorrect or misused model outputs and reports. Given that models are used across the Corporation, model risk impacts all risk types including credit, market and operational risk. 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 the Corporation's Risk Framework and risk appetite, prevailing regulatory guidance and industry best practice. All models, including risk management, valuation and regulatory capital models, must meet certain validation criteria, including effective challenge of the conceptual soundness of the model, independent model testing and ongoing monitoring through outcomes analysis and benchmarking. 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.

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 97.

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 risks 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, which 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 66.

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 45 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 45 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 45 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 45 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 45 presents year-end, average, high and low daily trading VaR for 2019 and 2018 using a 99 percent confidence level. The amounts disclosed in Table 45 and Table 46 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.

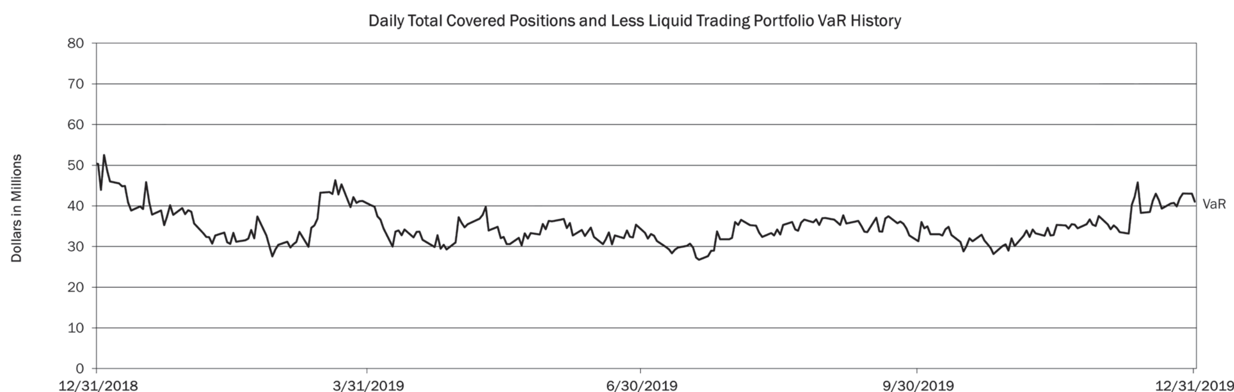
The annual average of total covered positions and less liquid trading positions portfolio VaR slightly increased during 2019 with no significant drivers.

Table 45 Market Risk VaR for Trading Activities

(Dollars in millions)	2019 Year End	2019 Average	2019 High [1]	2019 Low [1]	2018 Year End	2018 Average	2018 High [1]	2018 Low [1]
Foreign exchange	$ 4	$ 6	$ 13	$ 2	$ 9	$ 8	$ 15	$ 2
Interest rate	25	24	49	14	36	25	45	15
Credit	26	23	32	16	26	25	31	20
Equity	29	22	33	14	20	20	40	11
Commodities	4	6	31	4	13	8	15	3
Portfolio diversification	(47)	(49)	—	—	(59)	(55)	—	—
Total covered positions portfolio	41	32	47	24	45	31	45	20
Impact from less liquid exposures	—	3	—	—	5	3	—	—
Total covered positions and less liquid trading positions portfolio	41	35	53	27	50	34	51	23
Fair value option loans	8	10	13	7	8	11	18	8
Fair value option hedges	10	10	17	4	5	9	17	4
Fair value option portfolio diversification	(9)	(10)	—	—	(7)	(11)	—	—
Total fair value option portfolio	9	10	16	5	6	9	16	5
Portfolio diversification	(5)	(7)	—	—	(3)	(5)	—	—
Total market-based portfolio	$ 45	$ 38	56	28	$ 53	$ 38	57	26

(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 2019, corresponding to the data in Table 45.



Additional VaR statistics produced within our single VaR model are provided in Table 46 at the same level of detail as in Table 45. 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 46 presents average trading VaR statistics at 99 percent and 95 percent confidence levels for 2019 and 2018.

Table 46 Average Market Risk VaR for Trading Activities – 99 percent and 95 percent VaR Statistics

(Dollars in millions)	2019 99 percent	2019 95 percent	2018 99 percent	2018 95 percent
Foreign exchange	$ 6	$ 3	$ 8	$ 5
Interest rate	24	15	25	16
Credit	23	15	25	15
Equity	22	11	20	11
Commodities	6	3	8	4
Portfolio diversification	(49)	(29)	(55)	(33)
Total covered positions portfolio	32	18	31	18
Impact from less liquid exposures	3	2	3	1
Total covered positions and less liquid trading positions portfolio	35	20	34	19
Fair value option loans	10	5	11	6
Fair value option hedges	10	6	9	6
Fair value option portfolio diversification	(10)	(5)	(11)	(7)
Total fair value option portfolio	10	6	9	5
Portfolio diversification	(7)	(5)	(5)	(3)
Total market-based portfolio	$ 38	$ 21	$ 38	$ 21

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 intra-day trading revenues.

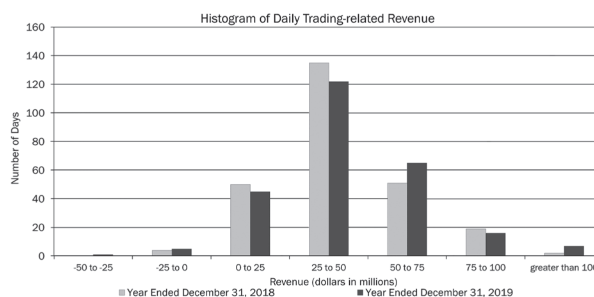
We conduct daily backtesting on the VaR results used for regulatory capital calculations as well as the VaR results for key legal entities, regions and risk factors. These results are reported to senior market risk management. Senior management regularly reviews and evaluates the results of these tests.

During 2019, there were no 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 21 – 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 2019 and 2018. During 2019, positive trading-related revenue was recorded for 98 percent of the trading days, of which 80 percent were daily trading gains of over $25 million, and the largest loss was $35 million. This compares to 2018 where 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.



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 63.

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 47 presents the spot and 12-month forward rates used in our baseline forecasts at December 31, 2019 and 2018.

Table 47 Forward Rates

	December 31, 2019		
	Federal Funds	Three-month LIBOR	10-Year Swap
Spot rates	**1.75%**	**1.91%**	**1.90%**
12-month forward rates	**1.50**	**1.62**	**1.92**
	December 31, 2018		
Spot rates	2.50%	2.81%	2.71%
12-month forward rates	2.50	2.64	2.75

Table 48 shows the pretax impact to forecasted net interest income over the next 12 months from December 31, 2019 and 2018, 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 2019, the asset sensitivity of our balance sheet increased primarily due to decreases in interest 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 available for sale (AFS), may adversely affect accumulated other comprehensive income (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 67.

Table 48 Estimated Banking Book Net Interest Income Sensitivity to Curve Changes

(Dollars in millions)	Short Rate (bps)	Long Rate (bps)	December 31 2019	2018
Parallel Shifts				
+100 bps instantaneous shift	+100	+100	**$ 4,190**	$ 2,833
-100 bps instantaneous shift	-100	-100	**(6,536)**	(4,280)
Flatteners				
Short-end instantaneous change	+100	—	**2,641**	2,158
Long-end instantaneous change	—	-100	**(2,965)**	(1,618)
Steepeners				
Short-end instantaneous change	-100	—	**(3,527)**	(2,648)
Long-end instantaneous change	—	+100	**1,561**	675

The sensitivity analysis in Table 48 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 deposits 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 48 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 2019 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 $496 million and $1.3 billion, on a pretax basis, at December 31, 2019 and 2018. 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, 2019, the pretax net losses are expected to be reclassified into earnings as follows: 17 percent within the next year, 44 percent in years two through five, 22 percent in years six through ten, with the remaining 17 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, 2019.

Table 49 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, 2019 and 2018. These amounts do not include derivative hedges on our MSRs. During 2019, the fair value of receive-fixed interest rate swaps increased while pay-fixed interest rate swaps decreased, driven by lower swap rates.

Table 49 Asset and Liability Management Interest Rate and Foreign Exchange Contracts

		December 31, 2019							
		Expected Maturity							
(Dollars in millions, average estimated duration in years)	Fair Value	Total	2020	2021	2022	2023	2024	Thereafter	Average Estimated Duration
Receive-fixed interest rate swaps [1]	$ 12,370								6.47
Notional amount		$215,123	$ 16,347	$ 14,642	$ 21,616	$ 36,356	$ 21,257	$104,905	
Weighted-average fixed-rate		2.68%	2.68%	3.17%	2.48%	2.36%	2.55%	2.79%	
Pay-fixed interest rate swaps [1]	(2,669)								6.99
Notional amount		$ 69,586	$ 4,344	$ 2,117	$ —	$ 13,993	$ 8,194	$ 40,938	
Weighted-average fixed-rate		2.36%	2.16%	2.15%	—%	2.52%	2.26%	2.35%	
Same-currency basis swaps [2]	(290)								
Notional amount		$152,160	$ 18,857	$ 18,590	$ 4,306	$ 2,017	$ 14,567	$ 93,823	
Foreign exchange basis swaps [1, 3, 4]	(1,258)								
Notional amount		113,529	23,639	24,215	14,611	7,111	3,521	40,432	
Foreign exchange contracts [1, 4, 5]	414								
Notional amount [6]		(53,106)	(79,315)	4,539	2,674	2,340	4,432	12,224	
Option products	—								
Notional amount		15	—	—	—	15	—	—	
Net ALM contracts	**$ 8,567**								

		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	
Foreign exchange contracts [1, 4, 5]	82								
Notional amount [6]		(8,447)	(27,823)	13	4,196	2,741	2,448	9,978	
Option products	2								
Notional amount		587	572	—	—	—	15	—	
Net ALM contracts	**$ 812**								

(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, 2019 and 2018, the notional amount of same-currency basis swaps included $152.2 billion and $101.2 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 $(53.1) billion at December 31, 2019 was comprised of $29.0 billion in foreign currency-denominated and cross-currency receive-fixed swaps, $(82.4) billion in net foreign currency forward rate contracts, $(313) million in foreign currency-denominated interest rate swaps and $644 million in net foreign currency futures contracts. Foreign exchange contracts of $(8.4) billion at December 31, 2018 were 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 interest rate swaps and $814 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 hedged items offset, we combine them into one overall hedged item with one combined economic hedge portfolio consisting of derivative contracts and securities.

During 2019, 2018 and 2017, we recorded gains of $291 million, $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 21 – 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 66.

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 third-party dependencies, 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.

Corporate Audit provides independent assessment and validation through testing of key compliance and operational risk processes and controls across the Corporation.

The Corporation's Global Compliance Enterprise Policy and Operational Risk Management - Enterprise Policy 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, including as a result of malicious technological attacks, that impact the confidentiality, availability or integrity of our, or third parties' (including their downstream service providers, the financial services industry and financial data aggregators) 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, detective and responsive 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 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, 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, 2019 would have increased $18 million. 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, 2019 would have increased $46 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 $2.6 billion at December 31, 2019.

The allowance for loan and lease losses as a percentage of total loans and leases at December 31, 2019 was 0.97 percent and these hypothetical increases in the allowance would raise the ratio to 1.24 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.

The processes, judgments and estimates described herein relate to the accounting standard in effect through December 31, 2019. On January 1, 2020, the Corporation adopted the new accounting standard that requires the measurement of the allowance for credit losses to be based on management's best estimate of lifetime expected credit losses inherent in the Corporation's relevant financial assets. The Corporation's lifetime expected credit losses are determined using macroeconomic forecast assumptions and management judgments applicable to and through the expected life of the loan portfolios. For more information, see *Note 1 – Summary of Significant Accounting Principles* to the Consolidated Financial Statements.

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 more information, see *Note 21 – Fair Value Measurements* and *Note 22 – 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 2019, 2018

and 2017, see *Note 21 – 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 20 – 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 2019 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* to the Consolidated Financial Statements.

We completed our annual goodwill impairment test as of June 30, 2019 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, 2019, see *Note 8 – Goodwill and Intangible Assets* to the Consolidated Financial Statements.

Certain Contingent Liabilities

For more information on the complex judgments associated with certain contingent liabilities, see *Note 13 – Commitments and Contingencies* to the Consolidated Financial Statements.

Non-GAAP Reconciliations

Tables 50 and 51 provide reconciliations of certain non-GAAP financial measures to GAAP financial measures.

Table 50 Five-year Reconciliations to GAAP Financial Measures [1]

(Dollars in millions, shares in thousands)	2019	2018	2017	2016	2015
Reconciliation of average shareholders' equity to average tangible shareholders' equity and average tangible common shareholders' equity					
Shareholders' equity	**$ 267,889**	$ 264,748	$ 271,289	$ 265,843	$ 251,384
Goodwill	**(68,951)**	(68,951)	(69,286)	(69,750)	(69,772)
Intangible assets (excluding MSRs)	**(1,721)**	(2,058)	(2,652)	(3,382)	(4,201)
Related deferred tax liabilities	**773**	906	1,463	1,644	1,852
Tangible shareholders' equity	**$ 197,990**	$ 194,645	$ 200,814	$ 194,355	$ 179,263
Preferred stock	**(23,036)**	(22,949)	(24,188)	(24,656)	(21,808)
Tangible common shareholders' equity	**$ 174,954**	$ 171,696	$ 176,626	$ 169,699	$ 157,455
Reconciliation of year-end shareholders' equity to year-end tangible shareholders' equity and year-end tangible common shareholders' equity					
Shareholders' equity	**$ 264,810**	$ 265,325	$ 267,146	$ 266,195	$ 255,615
Goodwill	**(68,951)**	(68,951)	(68,951)	(69,744)	(69,761)
Intangible assets (excluding MSRs)	**(1,661)**	(1,774)	(2,312)	(2,989)	(3,768)
Related deferred tax liabilities	**713**	858	943	1,545	1,716
Tangible shareholders' equity	**$ 194,911**	$ 195,458	$ 196,826	$ 195,007	$ 183,802
Preferred stock	**(23,401)**	(22,326)	(22,323)	(25,220)	(22,272)
Tangible common shareholders' equity	**$ 171,510**	$ 173,132	$ 174,503	$ 169,787	$ 161,530
Reconciliation of year-end assets to year-end tangible assets					
Assets	**$ 2,434,079**	$2,354,507	$2,281,234	$2,188,067	$2,144,606
Goodwill	**(68,951)**	(68,951)	(68,951)	(69,744)	(69,761)
Intangible assets (excluding MSRs)	**(1,661)**	(1,774)	(2,312)	(2,989)	(3,768)
Related deferred tax liabilities	**713**	858	943	1,545	1,716
Tangible assets	**$ 2,364,180**	$2,284,640	$2,210,914	$2,116,879	$2,072,793

[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 48.

Table 51 Quarterly Reconciliations to GAAP Financial Measures [1]

	2019 Quarters				2018 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	**$ 266,900**	$ 270,430	$ 267,975	$ 266,217	$ 263,698	$ 264,653	$ 265,181	$ 265,480
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)
Intangible assets (excluding MSRs)	**(1,678)**	(1,707)	(1,736)	(1,763)	(1,857)	(1,992)	(2,126)	(2,261)
Related deferred tax liabilities	**730**	752	770	841	874	896	916	939
Tangible shareholders' equity	**$ 197,001**	$ 200,524	$ 198,058	$ 196,344	$ 193,764	$ 194,606	$ 195,020	$ 195,207
Preferred stock	**(23,461)**	(23,800)	(22,537)	(22,326)	(22,326)	(22,841)	(23,868)	(22,767)
Tangible common shareholders' equity	**$ 173,540**	$ 176,724	$ 175,521	$ 174,018	$ 171,438	$ 171,765	$ 171,152	$ 172,440
Reconciliation of period-end shareholders' equity to period-end tangible shareholders' equity and period-end tangible common shareholders' equity								
Shareholders' equity	**$ 264,810**	$ 268,387	$ 271,408	$ 267,010	$ 265,325	$ 262,158	$ 264,216	$ 266,224
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)
Intangible assets (excluding MSRs)	**(1,661)**	(1,690)	(1,718)	(1,747)	(1,774)	(1,908)	(2,043)	(2,177)
Related deferred tax liabilities	**713**	734	756	773	858	878	900	920
Tangible shareholders' equity	**$ 194,911**	$ 198,480	$ 201,495	$ 197,085	$ 195,458	$ 192,177	$ 194,122	$ 196,016
Preferred stock	**(23,401)**	(23,606)	(24,689)	(22,326)	(22,326)	(22,326)	(23,181)	(24,672)
Tangible common shareholders' equity	**$ 171,510**	$ 174,874	$ 176,806	$ 174,759	$ 173,132	$ 169,851	$ 170,941	$ 171,344
Reconciliation of period-end assets to period-end tangible assets								
Assets	**$ 2,434,079**	$2,426,330	$2,395,892	$2,377,164	$2,354,507	$2,338,833	$2,291,670	$2,328,478
Goodwill	**(68,951)**	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)	(68,951)
Intangible assets (excluding MSRs)	**(1,661)**	(1,690)	(1,718)	(1,747)	(1,774)	(1,908)	(2,043)	(2,177)
Related deferred tax liabilities	**713**	734	756	773	858	878	900	920
Tangible assets	**$ 2,364,180**	$2,356,423	$2,325,979	$2,307,239	$2,284,640	$2,268,852	$2,221,576	$2,258,270

[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 48.

Statistical Tables
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Table I Outstanding Loans and Leases

	December 31				
(Dollars in millions)	**2019**	2018	2017	2016	2015
Consumer					
Residential mortgage	**$ 236,169**	$ 208,557	$ 203,811	$ 191,797	$ 187,911
Home equity	**40,208**	48,286	57,744	66,443	75,948
Credit card	**97,608**	98,338	96,285	92,278	89,602
Non-U.S. credit card	**—**	—	—	9,214	9,975
Direct/Indirect consumer [1]	**90,998**	91,166	96,342	95,962	90,149
Other consumer [2]	**192**	202	166	626	713
Total consumer loans excluding loans accounted for under the fair value option	**465,175**	446,549	454,348	456,320	454,298
Consumer loans accounted for under the fair value option [3]	**594**	682	928	1,051	1,871
Total consumer	**465,769**	447,231	455,276	457,371	456,169
Commercial					
U.S. commercial	**307,048**	299,277	284,836	270,372	252,771
Non-U.S. commercial	**104,966**	98,776	97,792	89,397	91,549
Commercial real estate [4]	**62,689**	60,845	58,298	57,355	57,199
Commercial lease financing	**19,880**	22,534	22,116	22,375	21,352
	494,583	481,432	463,042	439,499	422,871
U.S. small business commercial [5]	**15,333**	14,565	13,649	12,993	12,876
Total commercial loans excluding loans accounted for under the fair value option	**509,916**	495,997	476,691	452,492	435,747
Commercial loans accounted for under the fair value option [3]	**7,741**	3,667	4,782	6,034	5,067
Total commercial	**517,657**	499,664	481,473	458,526	440,814
Less: Loans of business held for sale [6]	**—**	—	—	(9,214)	—
Total loans and leases	**$ 983,426**	$ 946,895	$ 936,749	$ 906,683	$ 896,983

(1) Includes primarily auto and specialty lending loans and leases of $50.4 billion, $50.1 billion, $52.4 billion, $50.7 billion and $43.9 billion, U.S. securities-based lending loans of $36.7 billion, $37.0 billion, $39.8 billion, $40.1 billion and $39.8 billion and non-U.S. consumer loans of $2.8 billion, $2.9 billion, $3.0 billion, $3.0 billion and $3.9 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(2) Substantially all of other consumer at December 31, 2019, 2018 and 2017 is consumer overdrafts. Other consumer at December 31, 2016 and 2015 also includes consumer finance loans of $465 million and $564 million, respectively.

(3) Consumer loans accounted for under the fair value option include residential mortgage loans of $257 million, $336 million, $567 million, $710 million and $1.6 billion, and home equity loans of $337 million, $346 million, $361 million, $341 million and $250 million at December 31, 2019, 2018, 2017, 2016 and 2015, respectively. Commercial loans accounted for under the fair value option include U.S. commercial loans of $4.7 billion, $2.5 billion, $2.6 billion, $2.9 billion and $2.3 billion, and non-U.S. commercial loans of $3.1 billion, $1.1 billion, $2.2 billion, $3.1 billion and $2.8 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(4) Includes U.S. commercial real estate loans of $59.0 billion, $56.6 billion, $54.8 billion, $54.3 billion and $53.6 billion, and non-U.S. commercial real estate loans of $3.7 billion, $4.2 billion, $3.5 billion, $3.1 billion and $3.5 billion at December 31, 2019, 2018, 2017, 2016 and 2015, 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				
	2019	2018	2017	2016	2015
Consumer					
Residential mortgage	**$ 1,470**	$ 1,893	$ 2,476	$ 3,056	$ 4,803
Home equity	**536**	1,893	2,644	2,918	3,337
Direct/Indirect consumer	**47**	56	46	28	24
Other consumer	**—**	—	—	2	1
Total consumer [2]	**2,053**	3,842	5,166	6,004	8,165
Commercial					
U.S. commercial	**1,094**	794	814	1,256	867
Non-U.S. commercial	**43**	80	299	279	158
Commercial real estate	**280**	156	112	72	93
Commercial lease financing	**32**	18	24	36	12
	1,449	1,048	1,249	1,643	1,130
U.S. small business commercial	**50**	54	55	60	82
Total commercial [3]	**1,499**	1,102	1,304	1,703	1,212
Total nonperforming loans and leases	**3,552**	4,944	6,470	7,707	9,377
Foreclosed properties	**285**	300	288	377	459
Total nonperforming loans, leases and foreclosed properties	**$ 3,837**	$ 5,244	$ 6,758	$ 8,084	$ 9,836

(1) Balances exclude foreclosed properties insured by certain government-guaranteed loans, principally FHA-insured loans, that entered foreclosure of $260 million, $488 million, $801 million, $1.2 billion and $1.4 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(2) In 2019, $422 million in interest income was estimated to be contractually due on $2.1 billion of consumer loans and leases classified as nonperforming at December 31, 2019, as presented in the table above, plus $5.5 billion of TDRs classified as performing at December 31, 2019. Approximately $297 million of the estimated $422 million in contractual interest was received and included in interest income for 2019.

(3) In 2019, $133 million in interest income was estimated to be contractually due on $1.5 billion of commercial loans and leases classified as nonperforming at December 31, 2019, as presented in the table above, plus $1.3 billion of TDRs classified as performing at December 31, 2019. Approximately $88 million of the estimated $133 million in contractual interest was received and included in interest income for 2019.

Table III Accruing Loans and Leases Past Due 90 Days or More [1]

(Dollars in millions)	December 31				
	2019	2018	2017	2016	2015
Consumer					
Residential mortgage [2]	**$ 1,088**	$ 1,884	$ 3,230	$ 4,793	$ 7,150
Credit card	**1,042**	994	900	782	789
Non-U.S. credit card	**—**	—	—	66	76
Direct/Indirect consumer	**33**	38	40	34	39
Other consumer	**—**	—	—	4	3
Total consumer	**2,163**	2,916	4,170	5,679	8,057
Commercial					
U.S. commercial	**106**	197	144	106	113
Non-U.S. commercial	**8**	—	3	5	1
Commercial real estate	**19**	4	4	7	3
Commercial lease financing	**20**	29	19	19	15
	153	230	170	137	132
U.S. small business commercial	**97**	84	75	71	61
Total commercial	**250**	314	245	208	193
Total accruing loans and leases past due 90 days or more	**$ 2,413**	$ 3,230	$ 4,415	$ 5,887	$ 8,250

(1) Our policy is to classify consumer real estate-secured loans as nonperforming at 90 days past due, except 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, 2019 Due in One Year or Less	Due After One Year Through Five Years	Due After Five Years	Total
U.S. commercial	$ 76,523	$ 200,298	$ 50,216	**$ 327,037**
U.S. commercial real estate	13,683	39,259	6,023	**58,965**
Non-U.S. and other [3]	47,828	56,072	7,875	**111,775**
Total selected loans	**$ 138,034**	**$ 295,629**	**$ 64,114**	**$ 497,777**
Percent of total	28%	59%	13%	**100%**
Sensitivity of selected loans to changes in interest rates for loans due after one year:				
Fixed interest rates		$ 21,526	$ 31,383	
Floating or adjustable interest rates		274,103	32,731	
Total		**$ 295,629**	**$ 64,114**	

(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)	**2019**	2018	2017	2016	2015
Allowance for loan and lease losses, January 1	**$ 9,601**	$ 10,393	$ 11,237	$ 12,234	$ 14,419
Loans and leases charged off					
Residential mortgage	**(93)**	(207)	(188)	(403)	(866)
Home equity	**(429)**	(483)	(582)	(752)	(975)
Credit card	**(3,535)**	(3,345)	(2,968)	(2,691)	(2,738)
Non-U.S. credit card [1]	**—**	—	(103)	(238)	(275)
Direct/Indirect consumer	**(518)**	(495)	(491)	(392)	(383)
Other consumer	**(249)**	(197)	(212)	(232)	(224)
Total consumer charge-offs	**(4,824)**	(4,727)	(4,544)	(4,708)	(5,461)
U.S. commercial [2]	**(650)**	(575)	(589)	(567)	(536)
Non-U.S. commercial	**(115)**	(82)	(446)	(133)	(59)
Commercial real estate	**(31)**	(10)	(24)	(10)	(30)
Commercial lease financing	**(26)**	(8)	(16)	(30)	(19)
Total commercial charge-offs	**(822)**	(675)	(1,075)	(740)	(644)
Total loans and leases charged off	**(5,646)**	(5,402)	(5,619)	(5,448)	(6,105)
Recoveries of loans and leases previously charged off					
Residential mortgage	**140**	179	288	272	393
Home equity	**787**	485	369	347	339
Credit card	**587**	508	455	422	424
Non-U.S. credit card [1]	**—**	—	28	63	87
Direct/Indirect consumer	**309**	300	277	258	271
Other consumer	**15**	15	49	27	31
Total consumer recoveries	**1,838**	1,487	1,466	1,389	1,545
U.S. commercial [3]	**122**	120	142	175	172
Non-U.S. commercial	**31**	14	6	13	5
Commercial real estate	**2**	9	15	41	35
Commercial lease financing	**5**	9	11	9	10
Total commercial recoveries	**160**	152	174	238	222
Total recoveries of loans and leases previously charged off	**1,998**	1,639	1,640	1,627	1,767
Net charge-offs	**(3,648)**	(3,763)	(3,979)	(3,821)	(4,338)
Provision for loan and lease losses	**3,574**	3,262	3,381	3,581	3,043
Other [4]	**(111)**	(291)	(246)	(514)	(890)
Total allowance for loan and lease losses, December 31	**9,416**	9,601	10,393	11,480	12,234
Less: Allowance included in assets of business held for sale [5]	**—**	—	—	(243)	—
Allowance for loan and lease losses, December 31	**9,416**	9,601	10,393	11,237	12,234
Reserve for unfunded lending commitments, January 1	**797**	777	762	646	528
Provision for unfunded lending commitments	**16**	20	15	16	118
Other [4]	**—**	—	—	100	—
Reserve for unfunded lending commitments, December 31	**813**	797	777	762	646
Allowance for credit losses, December 31	**$ 10,229**	$ 10,398	$ 11,170	$ 11,999	$ 12,880

(1) Represents amounts 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 $320 million, $287 million, $258 million, $253 million and $282 million in 2019, 2018, 2017, 2016 and 2015, respectively.
(3) Includes U.S. small business commercial recoveries of $48 million, $47 million, $43 million, $45 million and $57 million in 2019, 2018, 2017, 2016 and 2015, respectively.
(4) Primarily represents write-offs of PCI loans, 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)	2019	2018	2017	2016	2015
Loan and allowance ratios [6]**:**					
Loans and leases outstanding at December 31 [7]	**$ 975,091**	$ 942,546	$ 931,039	$ 908,812	$ 890,045
Allowance for loan and lease losses as a percentage of total loans and leases outstanding at December 31 [7]	**0.97%**	1.02%	1.12%	1.26%	1.37%
Consumer allowance for loan and lease losses as a percentage of total consumer loans and leases outstanding at December 31 [8]	**0.98**	1.08	1.18	1.36	1.63
Commercial allowance for loan and lease losses as a percentage of total commercial loans and leases outstanding at December 31 [9]	**0.96**	0.97	1.05	1.16	1.11
Average loans and leases outstanding [7]	**$ 951,583**	$ 927,531	$ 911,988	$ 892,255	$ 869,065
Net charge-offs as a percentage of average loans and leases outstanding [7]	**0.38%**	0.41%	0.44%	0.43%	0.50%
Allowance for loan and lease losses as a percentage of total nonperforming loans and leases at December 31	**265**	194	161	149	130
Ratio of the allowance for loan and lease losses at December 31 to net charge-offs	**2.58**	2.55	2.61	3.00	2.82
Amounts included in allowance for loan and lease losses for loans and leases that are excluded from nonperforming loans and leases at December 31 [10]	**$ 4,151**	$ 4,031	$ 3,971	$ 3,951	$ 4,518
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 [10]	**148%**	113%	99%	98%	82%

(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 $8.3 billion, $4.3 billion, $5.7 billion, $7.1 billion and $6.9 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively. Average loans accounted for under the fair value option were $6.8 billion, $5.5 billion, $6.7 billion, $8.2 billion and $7.7 billion in 2019, 2018, 2017, 2016 and 2015, respectively.

(8) Excludes consumer loans accounted for under the fair value option of $594 million, $682 million, $928 million, $1.1 billion and $1.9 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(9) Excludes commercial loans accounted for under the fair value option of $7.7 billion, $3.7 billion, $4.8 billion, $6.0 billion and $5.1 billion at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(10) Primarily includes amounts allocated to credit card and unsecured consumer lending portfolios in *Consumer Banking* and, in 2016 and 2015, the non-U.S. credit card portfolio in *All Other*.

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

	December 31									
	2019		2018		2017		2016		2015	
(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	**$ 325**	**3.45%**	$ 422	4.40%	$ 701	6.74%	$ 1,012	8.82%	$ 1,500	12.26%
Home equity	**221**	**2.35**	506	5.27	1,019	9.80	1,738	15.14	2,414	19.73
Credit card	**3,710**	**39.39**	3,597	37.47	3,368	32.41	2,934	25.56	2,927	23.93
Non-U.S. credit card	**—**	**—**	—	—	—	—	243	2.12	274	2.24
Direct/Indirect consumer	**234**	**2.49**	248	2.58	264	2.54	244	2.13	223	1.82
Other consumer	**52**	**0.55**	29	0.30	31	0.30	51	0.44	47	0.38
Total consumer	**4,542**	**48.23**	4,802	50.02	5,383	51.79	6,222	54.21	7,385	60.36
U.S. commercial [1]	**3,015**	**32.02**	3,010	31.35	3,113	29.95	3,326	28.97	2,964	24.23
Non-U.S. commercial	**658**	**6.99**	677	7.05	803	7.73	874	7.61	754	6.17
Commercial real estate	**1,042**	**11.07**	958	9.98	935	9.00	920	8.01	967	7.90
Commercial lease financing	**159**	**1.69**	154	1.60	159	1.53	138	1.20	164	1.34
Total commercial	**4,874**	**51.77**	4,799	49.98	5,010	48.21	5,258	45.79	4,849	39.64
Total allowance for loan and lease losses	**9,416**	**100.00%**	9,601	100.00%	10,393	100.00%	11,480	100.00%	12,234	100.00%
Less: Allowance included in assets of business held for sale [2]	**—**		—		—		(243)		—	
Allowance for loan and lease losses	**9,416**		9,601		10,393		11,237		12,234	
Reserve for unfunded lending commitments	**813**		797		777		762		646	
Allowance for credit losses	**$ 10,229**		$ 10,398		$ 11,170		$ 11,999		$ 12,880	

(1) Includes allowance for loan and lease losses for U.S. small business commercial loans of $523 million, $474 million, $439 million, $416 million and $507 million at December 31, 2019, 2018, 2017, 2016 and 2015, respectively.

(2) Represents allowance for loan and lease losses related to the non-U.S. credit card loan portfolio, which was sold in 2017.

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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, 2019 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, 2019, the Corporation's internal control over financial reporting is effective.

The Corporation's internal control over financial reporting as of December 31, 2019 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, 2019.

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 (the "Corporation") as of December 31, 2019 and December 31, 2018, 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, 2019, 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, 2019, 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, 2019 and December 31, 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 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, 2019, 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.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Allowance for Loan and Lease Losses

As described in Notes 1 and 6 to the consolidated financial statements, the allowance for loan and lease losses represents management's estimate of probable incurred credit losses in the Corporation's loan and lease portfolio. As of December 31, 2019, the allowance for loan and lease losses was $9.4 billion on total loans and leases of $975.1 billion, which excludes loans accounted for under the fair value option. The allowance for loan and lease losses includes both quantitative and qualitative components. The allowance for certain consumer loan portfolios considers a variety of factors including 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. The allowance for

certain commercial loans is calculated using loss rates delineated by risk rating and product type. In addition, the qualitative component has a higher degree of management subjectivity, and includes factors such as concentrations, economic conditions and other considerations.

The principal considerations for our determination that performing procedures relating to the allowance for loan and lease losses is a critical audit matter are (i) there was significant judgment and estimation by management in determining the allowance for loan and lease losses, which in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and in evaluating audit evidence obtained relating to the allowance for loan and lease losses, including the qualitative component, and (ii) the audit effort involved professionals with specialized skill and knowledge to assist in evaluating certain audit evidence.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the allowance for loan and lease losses. These procedures also included, among others, testing management's process for estimating the allowance for loan and lease losses, including evaluating the appropriateness of the loss forecast models and methodology, testing the completeness and accuracy of certain data used in the allowance for loan and lease losses, and evaluating the reasonableness of significant assumptions and judgments used by management to estimate the qualitative component of the allowance for loan and lease losses including those judgments related to the impact of concentrations, economic conditions and other considerations. The procedures also included the involvement of professionals with specialized skill and knowledge to assist in evaluating the reasonableness of certain loss forecast models and methodologies, evaluating the reasonableness of risk ratings used in the allowance for commercial loans, and evaluating the reasonableness of certain judgments used by management in estimating the qualitative component of the allowance for loan and lease losses.

Valuation of Certain Level 3 Financial Instruments

As described in Notes 1 and 21 to the consolidated financial statements, the Corporation carries certain financial instruments at fair value, which includes $10.3 billion of assets and $5.9 billion of liabilities classified as Level 3 fair value measurements for which the determination of fair value requires significant management judgment or estimation. The Corporation determines the fair value of certain Level 3 financial instruments using quantitative models that utilize multiple significant unobservable inputs, including long-dated volatility and forward price, as applicable. As disclosed by management, estimation risk is greater for financial instruments 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 are used in determining fair values.

The principal considerations for our determination that performing procedures relating to the valuation of certain Level 3 financial instruments is a critical audit matter are the significant judgment and estimation used by management to determine the fair value of these financial instruments. This in turn led to a high degree of auditor judgment and effort in performing procedures, including the involvement of professionals with specialized skill and knowledge to assist in evaluating certain audit evidence.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the valuation of financial instruments, including controls related to valuation models, significant unobservable inputs, and data. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in developing an independent estimate of fair value for a sample of these certain financial instruments and comparison of management's estimate to the independently developed estimate of fair value. Developing the independent estimate involved testing the completeness and accuracy of data provided by management and evaluating the reasonableness of management's assumptions used to develop the significant unobservable inputs.

Charlotte, North Carolina
February 19, 2020

We have served as the Corporation's auditor since 1958.

Consolidated Statement of Income

(In millions, except per share information)	2019	2018	2017
Net interest income			
Interest income	$ 71,236	$ 66,769	$ 57,579
Interest expense	22,345	18,607	12,340
Net interest income	48,891	48,162	45,239
Noninterest income			
Fees and commissions	33,015	33,078	33,341
Market making and similar activities	9,034	9,008	7,102
Other income	304	772	1,444
Total noninterest income	42,353	42,858	41,887
Total revenue, net of interest expense	91,244	91,020	87,126
Provision for credit losses	3,590	3,282	3,396
Noninterest expense			
Compensation and benefits	31,977	31,880	31,931
Occupancy and equipment	6,588	6,380	6,264
Information processing and communications	4,646	4,555	4,530
Product delivery and transaction related	2,762	2,857	3,041
Marketing	1,934	1,674	1,746
Professional fees	1,597	1,699	1,888
Other general operating	5,396	4,109	5,117
Total noninterest expense	54,900	53,154	54,517
Income before income taxes	32,754	34,584	29,213
Income tax expense	5,324	6,437	10,981
Net income	$ 27,430	$ 28,147	$ 18,232
Preferred stock dividends	1,432	1,451	1,614
Net income applicable to common shareholders	$ 25,998	$ 26,696	$ 16,618
Per common share information			
Earnings	$ 2.77	$ 2.64	$ 1.63
Diluted earnings	2.75	2.61	1.56
Average common shares issued and outstanding	9,390.5	10,096.5	10,195.6
Average diluted common shares issued and outstanding	9,442.9	10,236.9	10,778.4

Consolidated Statement of Comprehensive Income

(Dollars in millions)	2019	2018	2017
Net income	$ 27,430	$ 28,147	$ 18,232
Other comprehensive income (loss), net-of-tax:			
Net change in debt securities	5,875	(3,953)	61
Net change in debit valuation adjustments	(963)	749	(293)
Net change in derivatives	616	(53)	64
Employee benefit plan adjustments	136	(405)	288
Net change in foreign currency translation adjustments	(86)	(254)	86
Other comprehensive income (loss)	5,578	(3,916)	206
Comprehensive income	$ 33,008	$ 24,231	$ 18,438

See accompanying Notes to Consolidated Financial Statements.

Consolidated Balance Sheet

(Dollars in millions)	December 31 2019	2018
Assets		
Cash and due from banks	$ **30,152**	$ 29,063
Interest-bearing deposits with the Federal Reserve, non-U.S. central banks and other banks	**131,408**	148,341
Cash and cash equivalents	**161,560**	177,404
Time deposits placed and other short-term investments	**7,107**	7,494
Federal funds sold and securities borrowed or purchased under agreements to resell (includes **$50,364** and $56,399 measured at fair value)	**274,597**	261,131
Trading account assets (includes **$90,946** and $119,363 pledged as collateral)	**229,826**	214,348
Derivative assets	**40,485**	43,725
Debt securities:		
Carried at fair value	**256,467**	238,101
Held-to-maturity, at cost (fair value – **$219,821** and $200,435)	**215,730**	203,652
Total debt securities	**472,197**	441,753
Loans and leases (includes **$8,335** and $4,349 measured at fair value)	**983,426**	946,895
Allowance for loan and lease losses	**(9,416)**	(9,601)
Loans and leases, net of allowance	**974,010**	937,294
Premises and equipment, net	**10,561**	9,906
Goodwill	**68,951**	68,951
Loans held-for-sale (includes **$3,709** and $2,942 measured at fair value)	**9,158**	10,367
Customer and other receivables	**55,937**	65,814
Other assets (includes **$15,518** and $19,739 measured at fair value)	**129,690**	116,320
Total assets	$ **2,434,079**	$ 2,354,507
Liabilities		
Deposits in U.S. offices:		
Noninterest-bearing	$ **403,305**	$ 412,587
Interest-bearing (includes **$508** and $492 measured at fair value)	**940,731**	891,636
Deposits in non-U.S. offices:		
Noninterest-bearing	**13,719**	14,060
Interest-bearing	**77,048**	63,193
Total deposits	**1,434,803**	1,381,476
Federal funds purchased and securities loaned or sold under agreements to repurchase (includes **$16,008** and $28,875 measured at fair value)	**165,109**	186,988
Trading account liabilities	**83,270**	68,220
Derivative liabilities	**38,229**	37,891
Short-term borrowings (includes **$3,941** and $1,648 measured at fair value)	**24,204**	20,189
Accrued expenses and other liabilities (includes **$15,434** and $20,075 measured at fair value and **$813** and $797 of reserve for unfunded lending commitments)	**182,798**	165,026
Long-term debt (includes **$34,975** and $27,689 measured at fair value)	**240,856**	229,392
Total liabilities	**2,169,269**	2,089,182
Commitments and contingencies *(Note 7 – Securitizations and Other Variable Interest Entities* and *Note 13 – Commitments and Contingencies)*		
Shareholders' equity		
Preferred stock, $0.01 par value; authorized – **100,000,000** shares; issued and outstanding – **3,887,440** and 3,843,140 shares	**23,401**	22,326
Common stock and additional paid-in capital, $0.01 par value; authorized – **12,800,000,000** shares; issued and outstanding – **8,836,148,954** and 9,669,286,370 shares	**91,723**	118,896
Retained earnings	**156,319**	136,314
Accumulated other comprehensive income (loss)	**(6,633)**	(12,211)
Total shareholders' equity	**264,810**	265,325
Total liabilities and shareholders' equity	$ **2,434,079**	$ 2,354,507

	2019	2018
Assets of consolidated variable interest entities included in total assets above (isolated to settle the liabilities of the variable interest entities)		
Trading account assets	$ **5,811**	$ 5,798
Loans and leases	**38,837**	43,850
Allowance for loan and lease losses	**(807)**	(912)
Loans and leases, net of allowance	**38,030**	42,938
All other assets	**540**	337
Total assets of consolidated variable interest entities	$ **44,381**	$ 49,073
Liabilities of consolidated variable interest entities included in total liabilities above		
Short-term borrowings	$ **2,175**	$ 742
Long-term debt (includes **$8,717** and $10,943 of non-recourse debt)	**8,718**	10,944
All other liabilities (includes **$19** and $27 of non-recourse liabilities)	**22**	30
Total liabilities of consolidated variable interest entities	$ **10,915**	$ 11,716

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, 2016	$ 25,220	10,052.6	$ 147,038	$ 101,225	$ (7,288)	$ 266,195
Net income				18,232		18,232
Net change in debt 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 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
Cumulative adjustment for adoption of lease accounting standard				**165**		**165**
Net income				**27,430**		**27,430**
Net change in debt securities					**5,875**	**5,875**
Net change in debit valuation adjustments					**(963)**	**(963)**
Net change in derivatives					**616**	**616**
Employee benefit plan adjustments					**136**	**136**
Net change in foreign currency translation adjustments					**(86)**	**(86)**
Dividends declared:						
Common				**(6,146)**		**(6,146)**
Preferred				**(1,432)**		**(1,432)**
Issuance of preferred stock	**3,643**					**3,643**
Redemption of preferred stock	**(2,568)**					**(2,568)**
Common stock issued under employee plans, net, and other		**123.3**	**971**	**(12)**		**959**
Common stock repurchased		**(956.5)**	**(28,144)**			**(28,144)**
Balance, December 31, 2019	**$ 23,401**	**8,836.1**	**$ 91,723**	**$ 156,319**	**$ (6,633)**	**$ 264,810**

See accompanying Notes to Consolidated Financial Statements.

Consolidated Statement of Cash Flows

(Dollars in millions)	2019	2018	2017
Operating activities			
Net income	$ 27,430	$ 28,147	$ 18,232
Adjustments to reconcile net income to net cash provided by operating activities:			
Provision for credit losses	3,590	3,282	3,396
Gains on sales of debt securities	(217)	(154)	(255)
Depreciation and amortization	1,729	2,063	2,103
Net amortization of premium/discount on debt securities	2,066	1,824	2,251
Deferred income taxes	2,435	3,041	8,175
Stock-based compensation	1,974	1,729	1,649
Impairment of equity method investment	2,072	—	—
Loans held-for-sale:			
Originations and purchases	(28,874)	(28,071)	(43,506)
Proceeds from sales and paydowns of loans originally classified as held for sale and instruments from related securitization activities	30,191	28,972	40,548
Net change in:			
Trading and derivative assets/liabilities	7,920	(23,673)	(14,663)
Other assets	(11,113)	11,920	(20,090)
Accrued expenses and other liabilities	16,363	13,010	4,673
Other operating activities, net	6,211	(2,570)	7,351
Net cash provided by operating activities	61,777	39,520	9,864
Investing activities			
Net change in:			
Time deposits placed and other short-term investments	387	3,659	(1,292)
Federal funds sold and securities borrowed or purchased under agreements to resell	(13,466)	(48,384)	(14,523)
Debt securities carried at fair value:			
Proceeds from sales	52,006	5,117	73,353
Proceeds from paydowns and maturities	79,114	78,513	93,874
Purchases	(152,782)	(76,640)	(166,975)
Held-to-maturity debt securities:			
Proceeds from paydowns and maturities	34,770	18,789	16,653
Purchases	(37,115)	(35,980)	(25,088)
Loans and leases:			
Proceeds from sales of loans originally classified as held for investment and instruments from related securitization activities	12,201	21,365	11,996
Purchases	(5,963)	(4,629)	(6,846)
Other changes in loans and leases, net	(46,808)	(31,292)	(41,104)
Other investing activities, net	(2,974)	(1,986)	8,411
Net cash used in investing activities	(80,630)	(71,468)	(51,541)
Financing activities			
Net change in:			
Deposits	53,327	71,931	48,611
Federal funds purchased and securities loaned or sold under agreements to repurchase	(21,879)	10,070	7,024
Short-term borrowings	4,004	(12,478)	8,538
Long-term debt:			
Proceeds from issuance	52,420	64,278	53,486
Retirement	(50,794)	(53,046)	(49,480)
Preferred stock:			
Proceeds from issuance	3,643	4,515	—
Redemption	(2,568)	(4,512)	—
Common stock repurchased	(28,144)	(20,094)	(12,814)
Cash dividends paid	(5,934)	(6,895)	(5,700)
Other financing activities, net	(698)	(651)	(397)
Net cash provided by financing activities	3,377	53,118	49,268
Effect of exchange rate changes on cash and cash equivalents	(368)	(1,200)	2,105
Net increase (decrease) in cash and cash equivalents	(15,844)	19,970	9,696
Cash and cash equivalents at January 1	177,404	157,434	147,738
Cash and cash equivalents at December 31	$ 161,560	$ 177,404	$ 157,434
Supplemental cash flow disclosures			
Interest paid	$ 22,196	$ 19,087	$ 12,852
Income taxes paid, net	4,359	2,470	3,235

See accompanying 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 requires management to make estimates and assumptions that affect reported amounts and disclosures. Actual results could materially differ from those estimates and assumptions. Certain prior-period amounts have been reclassified to conform to current-period presentation.

In the Consolidated Statement of Income, amounts related to certain asset and liability management (ALM) activities have been reclassified from other income to market making and similar activities, which was previously referred to as trading account income. All prior periods presented reflect this change, which has no impact on the Corporation's total noninterest income or net income, and has no impact on business segment results. The amounts included in market making and similar activities related to this change in presentation are increases of $930 million, $1.1 billion and $332 million for 2019, 2018 and 2017, respectively.

New Accounting Standards

Lease Accounting

On January 1, 2019, the Corporation adopted the new accounting standards that require lessees to recognize operating leases on the 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 are required prospectively and are included in *Note 9 – Leases*. The Corporation elected to retain prior determinations of whether an existing contract contains a lease and how the lease should be classified. The Corporation elected to recognize leases existing on January 1, 2019 through a cumulative-effect adjustment which increased retained earnings by $165 million, with no adjustment to prior periods presented. Upon adoption, the Corporation also recognized right-of-use assets and lease liabilities of $9.7 billion. Adoption of the standards did not have a significant effect on the Corporation's regulatory capital measures.

Accounting for Financial Instruments – Credit Losses

On January 1, 2020, the Corporation adopted the new accounting standard that requires the measurement of the allowance for credit losses to be based on management's best estimate of lifetime expected credit losses inherent in the Corporation's relevant financial assets. The Corporation's lifetime expected credit losses are determined using macroeconomic forecast assumptions and management judgments applicable to and through the expected life of the loan portfolios, and are net of expected recoveries on loans that were previously charged off. The standard also expands credit quality disclosures beginning in the first quarter of 2020. 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 or the ultimate losses in those portfolios. Upon adoption of the standard on January 1, 2020, the Corporation recorded a $3.3 billion, or 32 percent, increase to the allowance for credit losses. After adjusting for deferred taxes and other adoption effects, a $2.4 billion decrease was recorded in retained earnings through a cumulative-effect adjustment.

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 legally 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 market making and similar activities 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, 2019 and 2018, the fair value of this collateral was $693.0 billion and $599.0 billion, of which $593.8 billion and $508.6

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 market making and similar activities.

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 market making and similar activities.

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 market making and similar activities. 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 market making and similar activities and 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. The Corporation also uses cash flow hedges to hedge the price risk associated with deferred compensation. Changes in the fair value of derivatives used in cash flow hedges are recorded in accumulated other comprehensive income (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 market making and similar activities.

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 market making and similar activities. Substantially all other debt securities purchased are used in the Corporation's 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 recorded at cost less impairment, if any, plus or minus qualifying observable price changes. These securities are reported in other assets.

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 interest reported in interest income and changes in fair value reported in market making and similar activities or 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 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.

Leases

The Corporation provides equipment financing to its customers through a variety of lessor arrangements. Direct financing leases and sales-type leases are carried at the aggregate of lease payments receivable plus the estimated residual value of the leased property less unearned income, which is accreted to interest income over the lease terms using methods that approximate the interest method. Operating lease income is recognized on a straight-line basis. The Corporation's lease arrangements generally do not contain non-lease components.

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 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 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. 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.

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 and LHFS 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 the Corporation intends to sell 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 with interest recorded in interest income and changes in fair value recorded in other income. 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.

Lessee Arrangements

Substantially all of the Corporation's lessee arrangements are operating leases. Under these arrangements, the Corporation records right-of-use assets and lease liabilities at lease commencement. Right-of-use assets are reported in other assets on the Consolidated Balance Sheet, and the related lease liabilities are reported in accrued expenses and other liabilities. All leases are recorded on the Consolidated Balance Sheet except leases with an initial term less than 12 months for which the Corporation made the short-term lease election. Lease expense is recognized on a straight-line basis over the lease term and is recorded in occupancy and equipment expense in the Consolidated Statement of Income.

The Corporation made an accounting policy election not to separate lease and non-lease components of a contract that is or contains a lease for its real estate and equipment leases. As such, lease payments represent payments on both lease and non-lease components. At lease commencement, lease liabilities are recognized based on the present value of the remaining lease payments and discounted using the Corporation's incremental borrowing rate. Right-of-use assets initially equal the lease liability, adjusted for any lease payments made prior to lease commencement and for any lease incentives.

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. Under applicable accounting standards, fair value measurements are categorized into one of 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 clients with transactions related to mergers and acquisitions and financial restructurings. Revenue varies depending on the size of the transaction and scope of services performed and is generally contingent on successful completion 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 client.

Other Revenue Measurement and Recognition Policies

The Corporation did not disclose the value of any open performance obligations at December 31, 2019, 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 Net Interest Income and Noninterest Income

The table below presents the Corporation's net interest income and noninterest income disaggregated by revenue source for 2019, 2018 and 2017. 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 24 – Business Segment Information*.

(Dollars in millions)	2019	2018	2017
Net interest income			
Interest income			
Loans and leases	$ **43,086**	$ 40,811	$ 36,221
Debt securities	**11,806**	11,724	10,471
Federal funds sold and securities borrowed or purchased under agreements to resell	**4,843**	3,176	2,390
Trading account assets	**5,196**	4,811	4,474
Other interest income	**6,305**	6,247	4,023
Total interest income	**71,236**	66,769	57,579
Interest expense			
Deposits	**7,188**	4,495	1,931
Short-term borrowings	**7,208**	5,839	3,538
Trading account liabilities	**1,249**	1,358	1,204
Long-term debt	**6,700**	6,915	5,667
Total interest expense	**22,345**	18,607	12,340
Net interest income	$ **48,891**	$ 48,162	$ 45,239
Noninterest income			
Fees and commissions			
Card income			
Interchange fees [1]	$ **3,834**	$ 3,866	$ 3,777
Other card income	**1,963**	1,958	1,899
Total card income	**5,797**	5,824	5,676
Service charges			
Deposit-related fees	**6,588**	6,667	6,708
Lending-related fees	**1,086**	1,100	1,110
Total service charges	**7,674**	7,767	7,818
Investment and brokerage services			
Asset management fees	**10,241**	10,189	9,310
Brokerage fees	**3,661**	3,971	4,526
Total investment and brokerage services	**13,902**	14,160	13,836
Investment banking fees			
Underwriting income	**2,998**	2,722	2,821
Syndication fees	**1,184**	1,347	1,499
Financial advisory services	**1,460**	1,258	1,691
Total investment banking fees	**5,642**	5,327	6,011
Total fees and commissions	**33,015**	33,078	33,341
Market making and similar activities	**9,034**	9,008	7,102
Other income	**304**	772	1,444
Total noninterest income	$ **42,353**	$ 42,858	$ 41,887

[1] Gross interchange fees were $10.0 billion, $9.5 billion and $8.8 billion for 2019, 2018 and 2017, respectively, and are presented net of $6.2 billion, $5.6 billion and $5.1 billion of expenses for rewards and partner payments for the same periods.

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, 2019 and 2018. 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, 2019					
		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	$ 15,074.4	$ 162.0	$ 9.7	$ 171.7	$ 168.5	$ 0.4	$ 168.9
Futures and forwards	3,279.8	1.0	—	1.0	1.0	—	1.0
Written options	1,767.7	—	—	—	32.5	—	32.5
Purchased options	1,673.6	37.4	—	37.4	—	—	—
Foreign exchange contracts							
Swaps	1,657.7	30.3	0.7	31.0	31.7	0.9	32.6
Spot, futures and forwards	3,792.7	35.9	0.1	36.0	38.7	0.3	39.0
Written options	274.3	—	—	—	3.8	—	3.8
Purchased options	261.6	4.0	—	4.0	—	—	—
Equity contracts							
Swaps	315.0	6.5	—	6.5	8.1	—	8.1
Futures and forwards	125.1	0.3	—	0.3	1.1	—	1.1
Written options	731.1	—	—	—	34.6	—	34.6
Purchased options	668.6	42.4	—	42.4	—	—	—
Commodity contracts							
Swaps	42.0	2.1	—	2.1	4.4	—	4.4
Futures and forwards	61.3	1.7	—	1.7	0.4	—	0.4
Written options	33.2	—	—	—	1.4	—	1.4
Purchased options	37.9	1.4	—	1.4	—	—	—
Credit derivatives [2]							
Purchased credit derivatives:							
Credit default swaps	321.6	2.7	—	2.7	5.6	—	5.6
Total return swaps/options	86.6	0.4	—	0.4	1.3	—	1.3
Written credit derivatives:							
Credit default swaps	300.2	5.4	—	5.4	2.0	—	2.0
Total return swaps/options	86.2	0.8	—	0.8	0.4	—	0.4
Gross derivative assets/liabilities		$ 334.3	$ 10.5	$ 344.8	$ 335.5	$ 1.6	$ 337.1
Less: Legally enforceable master netting agreements				(270.4)			(270.4)
Less: Cash collateral received/paid				(33.9)			(28.5)
Total derivative assets/liabilities				$ 40.5			$ 38.2

[1] Represents the total contract/notional amount of derivative assets and liabilities outstanding.

[2] The net derivative asset (liability) and notional amount of written credit derivatives for which the Corporation held purchased credit derivatives with identical underlying referenced names were $2.8 billion and $309.7 billion at December 31, 2019.

		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)]							
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 asset (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.

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, 2019 and 2018 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 11 – 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, 2019		December 31, 2018	
Interest rate contracts				
Over-the-counter	$ 203.1	$ 196.6	$ 174.2	$ 169.4
Exchange-traded	0.1	0.1	—	—
Over-the-counter cleared	6.0	5.3	4.8	4.0
Foreign exchange contracts				
Over-the-counter	69.2	73.1	82.5	86.3
Over-the-counter cleared	0.5	0.5	0.9	0.9
Equity contracts				
Over-the-counter	21.3	17.8	24.6	14.6
Exchange-traded	26.4	22.8	16.1	15.1
Commodity contracts				
Over-the-counter	2.8	4.2	3.5	4.5
Exchange-traded	0.8	0.8	1.0	0.9
Over-the-counter cleared	—	0.1	—	—
Credit derivatives				
Over-the-counter	6.4	6.6	7.7	8.2
Over-the-counter cleared	2.5	2.2	2.5	2.3
Total gross derivative assets/liabilities, before netting				
Over-the-counter	302.8	298.3	292.5	283.0
Exchange-traded	27.3	23.7	17.1	16.0
Over-the-counter cleared	9.0	8.1	8.2	7.2
Less: Legally enforceable master netting agreements and cash collateral received/paid				
Over-the-counter	(274.7)	(269.3)	(264.4)	(259.2)
Exchange-traded	(21.5)	(21.5)	(13.5)	(13.5)
Over-the-counter cleared	(8.1)	(8.1)	(7.2)	(7.2)
Derivative assets/liabilities, after netting	34.8	31.2	32.7	26.3
Other gross derivative assets/liabilities [2]	5.7	7.0	11.0	11.6
Total derivative assets/liabilities	40.5	38.2	43.7	37.9
Less: Financial instruments collateral [3]	(14.6)	(16.1)	(16.3)	(8.6)
Total net derivative assets/liabilities	$ 25.9	$ 22.1	$ 27.4	$ 29.3

(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.

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. 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 credit default swaps (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 2019, 2018 and 2017.

Gains and Losses on Derivatives Designated as Fair Value Hedges

	Derivative			Hedged Item		
(Dollars in millions)	**2019**	2018	2017	**2019**	2018	2017
Interest rate risk on long-term debt [(1)]	**$ 6,113**	$ (1,538)	$ (1,537)	**$ (6,110)**	$ 1,429	$ 1,045
Interest rate and foreign currency risk on long-term debt [(2)]	**119**	(1,187)	1,811	**(101)**	1,079	(1,767)
Interest rate risk on available-for-sale securities [(3)]	**(102)**	(52)	(67)	**98**	50	35
Total	**$ 6,130**	$ (2,777)	$ 207	**$ (6,113)**	$ 2,558	$ (687)

(1) Amounts are recorded in interest expense in the Consolidated Statement of Income.
(2) In 2019, 2018 and 2017, the derivative amount includes gains (losses) of $73 million, $(116) million and $(365) million in interest expense, $28 million, $(992) million and $2.2 billion in market making and similar activities, and $18 million and $(79) million in accumulated OCI, respectively. Line item totals are in the Consolidated Statement of Income and in the Consolidated Balance Sheet.
(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)

	Carrying Value	**Cumulative Fair Value Adjustments [(1)]**	Carrying Value	Cumulative Fair Value Adjustments [(1)]
(Dollars in millions)	**December 31, 2019**		December 31, 2018	
Long-term debt [(2)]	**$ (162,389)**	**$ (8,685)**	$ (138,682)	$ (2,117)
Available-for-sale debt securities [(2)]	**1,654**	**64**	981	(29)

(1) For assets, increase (decrease) to carrying value and for liabilities, (increase) decrease to carrying value.
(2) At December 31, 2019 and 2018, the cumulative fair value adjustments remaining on long-term debt and AFS debt securities from discontinued hedging relationships resulted in a decrease in the related liability of $1.3 billion and $1.6 billion and an increase (decrease) in the related asset of $8 million 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 2019, 2018 and 2017. Of the $400 million after-tax net loss ($526 million pretax) on derivatives in accumulated OCI at December 31, 2019, $68 million after-tax ($90 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 3 years, with a maximum length of time for certain forecasted transactions of 16 years.

Gains and Losses on Derivatives Designated as Cash Flow and Net Investment Hedges

	Gains (Losses) in Accumulated OCI on Derivatives			Gains (Losses) in Income Reclassified from Accumulated OCI		
(Dollars in millions, amounts pretax)	**2019**	2018	2017	**2019**	2018	2017
Cash flow hedges						
Interest rate risk on variable-rate assets [(1)]	**$ 671**	$ (159)	$ (109)	**$ (104)**	$ (165)	$ (327)
Price risk on certain compensation plans [(2)]	**34**	4	59	**(2)**	27	148
Total	**$ 705**	$ (155)	$ (50)	**$ (106)**	$ (138)	$ (179)
Net investment hedges						
Foreign exchange risk [(3)]	**$ 22**	$ 989	$ (1,588)	**$ 366**	$ 411	$ 1,782

(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 compensation and benefits 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 market making and similar activities were gains of $154 million, $47 million and $120 million in 2019, 2018 and 2017, 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 following table presents gains (losses) on these derivatives for 2019, 2018 and 2017. These gains (losses) are largely offset by the income or expense recorded on the hedged item.

Gains and Losses on Other Risk Management Derivatives

(Dollars in millions)	2019	2018	2017
Interest rate risk on mortgage activities [1, 2]	$ **315**	$ (107)	$ 8
Credit risk on loans [2]	**(58)**	9	(6)
Interest rate and foreign currency risk on ALM activities [3]	**1,112**	3,278	(1,318)
Price risk on certain compensation plans [4]	**943**	(495)	704

(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 $73 million, $47 million and $220 million in 2019, 2018 and 2017, respectively.

(2) Gains (losses) on these derivatives are recorded in other income.

(3) Gains (losses) on these derivatives are recorded in market making and similar activities. Prior-period amounts have been updated to conform to the current-period presentation.

(4) Gains (losses) on these derivatives are recorded in compensation and benefits expense.

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, 2019 and 2018, the Corporation had transferred $5.2 billion and $5.8 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 $5.2 billion and $5.8 billion at the transfer dates. At December 31, 2019 and 2018, the fair value of the transferred securities was $5.3 billion and $5.5 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 market making and similar activities 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 market making and similar activities. For debt securities, revenue, with the exception of interest associated with the debt securities, is typically included in market making and similar activities. 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 market making and similar activities as part of the initial mark to fair value. For derivatives, the majority of revenue is included in market making and similar activities. In transactions where the Corporation acts as agent, which include exchange-traded futures and options, fees are recorded in other income.

The following table, 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 2019, 2018 and 2017. This table includes debit valuation adjustment (DVA) and funding valuation adjustment (FVA) gains (losses). *Global Markets* results in *Note 24 – 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)	Market making and similar activities	Net Interest Income	Other [1]	Total
	2019			
Interest rate risk	**$ 916**	**$ 1,831**	**$ 121**	**$ 2,868**
Foreign exchange risk	**1,300**	**54**	**43**	**1,397**
Equity risk	**3,565**	**(638)**	**1,574**	**4,501**
Credit risk	**1,158**	**1,800**	**511**	**3,469**
Other risk	**123**	**75**	**57**	**255**
Total sales and trading revenue	**$ 7,062**	**$ 3,122**	**$ 2,306**	**$ 12,490**
	2018			
Interest rate risk	$ 784	$ 1,696	$ 259	$ 2,739
Foreign exchange risk	1,486	11	14	1,511
Equity risk	3,874	(662)	1,644	4,856
Credit risk	1,063	1,861	588	3,512
Other risk	50	202	53	305
Total sales and trading revenue	$ 7,257	$ 3,108	$ 2,558	$ 12,923
	2017			
Interest rate risk	$ 429	$ 1,846	$ 248	$ 2,523
Foreign exchange risk	1,409	12	9	1,430
Equity risk	2,598	(427)	1,904	4,075
Credit risk	1,685	1,945	578	4,208
Other risk	79	170	75	324
Total sales and trading revenue	$ 6,200	$ 3,546	$ 2,814	$ 12,560

(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, $1.7 billion and $2.0 billion in 2019, 2018 and 2017, 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, 2019 and 2018 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, 2019		
			Carrying Value		
Credit default swaps:					
Investment grade	$ —	$ 5	$ 60	$ 164	$ 229
Non-investment grade	70	292	561	808	1,731
Total	70	297	621	972	1,960
Total return swaps/options:					
Investment grade	35	—	—	—	35
Non-investment grade	344	—	—	—	344
Total	379	—	—	—	379
Total credit derivatives	$ 449	$ 297	$ 621	$ 972	$ 2,339
Credit-related notes:					
Investment grade	$ —	$ 3	$ 1	$ 639	$ 643
Non-investment grade	6	2	1	1,125	1,134
Total credit-related notes	$ 6	$ 5	$ 2	$ 1,764	$ 1,777
			Maximum Payout/Notional		
Credit default swaps:					
Investment grade	$ 55,827	$ 67,838	$ 71,320	$ 17,708	$ 212,693
Non-investment grade	19,049	26,521	29,618	12,337	87,525
Total	74,876	94,359	100,938	30,045	300,218
Total return swaps/options:					
Investment grade	56,488	—	62	76	56,626
Non-investment grade	28,707	657	104	60	29,528
Total	85,195	657	166	136	86,154
Total credit derivatives	$ 160,071	$ 95,016	$ 101,104	$ 30,181	$ 386,372
			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

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 124, 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.

Certain 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, 2019 and 2018, the Corporation held cash and securities collateral of $84.3 billion and $81.6 billion and posted cash and securities collateral of $69.1 billion and $56.5 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, 2019, 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 $2.3 billion, including $913 million for Bank of America, National Association (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, 2019 and 2018, the liability recorded for these derivative contracts was not significant.

The following table presents the amount of additional collateral that would have been contractually required by derivative contracts and other trading agreements at December 31, 2019 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, 2019

(Dollars in millions)	One incremental notch	Second incremental notch
Bank of America Corporation	$ 480	$ 491
Bank of America, N.A. and subsidiaries [1]	222	353

[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, 2019 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, 2019

(Dollars in millions)	One incremental notch	Second incremental notch
Derivative liabilities	$ 57	$ 783
Collateral posted	42	411

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 rates and foreign exchange rates 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 foreign exchange 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 market making and similar activities, on a gross and net of hedge basis for 2019, 2018 and 2017. 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 Gains (Losses) on Derivatives [1]

	Gross 2019	Net 2019	Gross 2018	Net 2018	Gross 2017	Net 2017
Derivative assets (CVA)	**$ 72**	**$ 45**	$ 77	$ 187	$ 330	$ 98
Derivative assets/liabilities (FVA)	**(2)**	**46**	(15)	14	160	178
Derivative liabilities (DVA)	**(147)**	**(135)**	(19)	(55)	(324)	(281)

[1] At December 31, 2019, 2018 and 2017, cumulative CVA reduced the derivative assets balance by $528 million, $600 million and $677 million, cumulative FVA reduced the net derivatives balance by $153 million, $151 million and $136 million, and cumulative DVA reduced the derivative liabilities balance by $285 million, $432 million and $450 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, 2019 and 2018.

Debt Securities

(Dollars in millions)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	December 31, 2019			
Available-for-sale debt securities				
Mortgage-backed securities:				
Agency	**$ 121,698**	**$ 1,013**	**$ (183)**	**$ 122,528**
Agency-collateralized mortgage obligations	**4,587**	**78**	**(24)**	**4,641**
Commercial	**14,797**	**249**	**(25)**	**15,021**
Non-agency residential [1]	**948**	**138**	**(9)**	**1,077**
Total mortgage-backed securities	**142,030**	**1,478**	**(241)**	**143,267**
U.S. Treasury and agency securities	**67,700**	**1,023**	**(195)**	**68,528**
Non-U.S. securities	**11,987**	**6**	**(2)**	**11,991**
Other taxable securities, substantially all asset-backed securities	**3,874**	**67**	**—**	**3,941**
Total taxable securities	**225,591**	**2,574**	**(438)**	**227,727**
Tax-exempt securities	**17,716**	**202**	**(6)**	**17,912**
Total available-for-sale debt securities	**243,307**	**2,776**	**(444)**	**245,639**
Other debt securities carried at fair value [2]	**10,596**	**255**	**(23)**	**10,828**
Total debt securities carried at fair value	**253,903**	**3,031**	**(467)**	**256,467**
Held-to-maturity debt securities, substantially all U.S. agency mortgage-backed securities	**215,730**	**4,433**	**(342)**	**219,821**
Total debt securities [3, 4]	**$ 469,633**	**$ 7,464**	**$ (809)**	**$ 476,288**
	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 [2]	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	203,652	747	(3,964)	200,435
Total debt securities [3, 4]	$ 446,527	$ 1,418	$ (9,409)	$ 438,536

[1] At December 31, 2019 and 2018, the underlying collateral type included approximately 49 percent and 68 percent prime, six percent and four percent Alt-A and 45 percent and 28 percent subprime.
[2] Primarily includes non-U.S. securities used to satisfy certain international regulatory requirements. Any changes in value are reported in other income. For detail on the components, see *Note 21 – Fair Value Measurements*.
[3] Includes securities pledged as collateral of $67.0 billion and $40.6 billion at December 31, 2019 and 2018.
[4] The Corporation held debt securities from FNMA and FHLMC that each exceeded 10 percent of shareholders' equity, with an amortized cost of $157.2 billion and $54.1 billion, and a fair value of $160.6 billion and $55.1 billion at December 31, 2019, and 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.

At December 31, 2019, the accumulated net unrealized gain on AFS debt securities, excluding the amount related to debt securities previously transferred to held to maturity, included in accumulated OCI was $1.8 billion, net of the related income tax expense of $569 million. The Corporation had nonperforming AFS debt securities of $9 million and $11 million at December 31, 2019 and 2018.

At December 31, 2019, the Corporation held equity securities at an aggregate fair value of $891 million and other equity securities, as valued under the measurement alternative, at cost of $183 million, both of which are included in other assets. At December 31, 2019, the Corporation also held equity securities at fair value of $1.0 billion included in time deposits placed and other short-term investments.

The gross realized gains and losses on sales of AFS debt securities for 2019, 2018 and 2017 are presented in the table below.

Gains and Losses on Sales of AFS Debt Securities

(Dollars in millions)	**2019**	2018	2017
Gross gains	**$ 336**	$ 169	$ 352
Gross losses	**(119)**	(15)	(97)
Net gains on sales of AFS debt securities	**$ 217**	$ 154	$ 255
Income tax expense attributable to realized net gains on sales of AFS debt securities	**$ 54**	$ 37	$ 97

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, 2019 and 2018.

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, 2019					
Temporarily impaired AFS debt securities						
Mortgage-backed securities:						
Agency	$ 17,641	$ (41)	$ 17,238	$ (142)	$ 34,879	$ (183)
Agency-collateralized mortgage obligations	255	(1)	925	(23)	1,180	(24)
Commercial	2,180	(22)	442	(3)	2,622	(25)
Non-agency residential	19	(1)	1	—	20	(1)
Total mortgage-backed securities	20,095	(65)	18,606	(168)	38,701	(233)
U.S. Treasury and agency securities	12,836	(71)	18,866	(124)	31,702	(195)
Non-U.S. securities	851	—	837	(2)	1,688	(2)
Other taxable securities, substantially all asset-backed securities	938	—	222	—	1,160	—
Total taxable securities	34,720	(136)	38,531	(294)	73,251	(430)
Tax-exempt securities	4,286	(5)	190	(1)	4,476	(6)
Total temporarily impaired AFS debt securities	39,006	(141)	38,721	(295)	77,727	(436)
Other-than-temporarily impaired AFS debt securities [(1)]						
Non-agency residential mortgage-backed securities	103	(5)	21	(3)	124	(8)
Total temporarily impaired and other-than-temporarily impaired AFS debt securities	$ 39,109	$ (146)	$ 38,742	$ (298)	$ 77,851	$ (444)
	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)

[(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 2019, 2018 and 2017, the Corporation had $24 million, $33 million and $41 million, respectively, of credit-related OTTI losses on AFS debt securities which were recognized in other income. The amount of non-credit related OTTI losses for these AFS debt securities, which is 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 $85 million, $120 million and $274 million at December 31, 2019, 2018 and 2017, 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, 2019.

Significant Assumptions

	Weighted average	Range [1] 10th Percentile [2]	Range [1] 90th Percentile [2]
Prepayment speed	16.6%	5.5%	27.8%
Loss severity	14.7	8.0	30.7
Life default rate	11.9	1.0	36.5

(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 12.9 percent for prime, 11.1 percent for Alt-A and 18.8 percent for subprime at December 31, 2019. 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 7.8 percent for prime, 11.6 percent for Alt-A and 13.6 percent for subprime at December 31, 2019.

The remaining contractual maturity distribution and yields of the Corporation's debt securities carried at fair value and HTM debt securities at December 31, 2019 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

	Due in One Year or Less		Due after One Year through Five Years		Due after Five Years through Ten Years		Due after Ten Years		Total	
(Dollars in millions)	Amount	Yield [1]	Amount	Yield [1]	Amount	Yield [1]	Amount	Yield [1]	Amount	Yield [1]
Amortized cost of debt securities carried at fair value										
Mortgage-backed securities:										
Agency	$ —	—%	$ 11	5.25%	$ 66	4.56%	$124,618	3.24%	$124,695	3.24%
Agency-collateralized mortgage obligations	—	—	—	—	27	2.48	4,560	3.16	4,587	3.16
Commercial	—	—	3,806	2.37	10,136	2.57	868	2.99	14,810	2.54
Non-agency residential	—	—	—	—	12	—	2,157	9.26	2,169	9.22
Total mortgage-backed securities	—	—	3,817	2.38	10,241	2.58	132,203	3.33	146,261	3.25
U.S. Treasury and agency securities	1,350	0.92	35,544	1.67	30,789	2.25	20	2.45	67,703	1.92
Non-U.S. securities	15,648	1.17	2,598	1.03	7	4.17	96	6.74	18,349	1.18
Other taxable securities, substantially all asset-backed securities	1,189	2.80	1,650	3.02	440	3.32	595	2.91	3,874	2.97
Total taxable securities	18,187	1.26	43,609	1.74	41,477	2.34	132,914	3.34	236,187	2.70
Tax-exempt securities	2,189	1.72	7,472	2.10	4,849	2.06	3,206	2.44	17,716	2.10
Total amortized cost of debt securities carried at fair value	**$ 20,376**	**1.31**	**$ 51,081**	**1.79**	**$ 46,326**	**2.31**	**$ 136,120**	**3.32**	**$ 253,903**	**2.67**
Amortized cost of HTM debt securities [2]	**$ 1,025**	**2.83**	**$ 48**	**3.57**	**$ 1,102**	**2.57**	**$ 213,555**	**3.19**	**$ 215,730**	**3.19**
Debt securities carried at fair value										
Mortgage-backed securities:										
Agency	$ —		$ 11		$ 71		$125,449		$125,531	
Agency-collateralized mortgage obligations	—		—		26		4,615		4,641	
Commercial	—		3,854		10,287		893		15,034	
Non-agency residential	—		—		25		2,386		2,411	
Total mortgage-backed securities	—		3,865		10,409		133,343		147,617	
U.S. Treasury and agency securities	1,347		35,686		31,478		20		68,531	
Non-U.S. securities	15,751		2,606		8		98		18,463	
Other taxable securities, substantially all asset-backed securities	1,196		1,687		465		596		3,944	
Total taxable securities	18,294		43,844		42,360		134,057		238,555	
Tax-exempt securities	2,192		7,509		4,976		3,235		17,912	
Total debt securities carried at fair value	**$ 20,486**		**$ 51,353**		**$ 47,336**		**$ 137,292**		**$ 256,467**	
Fair value of HTM debt securities [2]	**$ 1,025**		**$ 48**		**$ 1,113**		**$ 217,635**		**$ 219,821**	

(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, 2019 and 2018.

(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)]	Loans Accounted for Under the Fair Value Option	Total Outstandings
	December 31, 2019						
Consumer real estate							
Core portfolio							
Residential mortgage	$ 1,378	$ 261	$ 565	$ 2,204	$ 223,566		$ 225,770
Home equity	135	70	198	403	34,823		35,226
Non-core portfolio							
Residential mortgage	458	209	1,263	1,930	8,469		10,399
Home equity	34	16	72	122	4,860		4,982
Credit card and other consumer							
Credit card	564	429	1,042	2,035	95,573		97,608
Direct/Indirect consumer [(4)]	297	85	35	417	90,581		90,998
Other consumer	—	—	—	—	192		192
Total consumer	2,866	1,070	3,175	7,111	458,064		465,175
Consumer loans accounted for under the fair value option [(5)]						$ 594	594
Total consumer loans and leases	2,866	1,070	3,175	7,111	458,064	594	465,769
Commercial							
U.S. commercial	788	279	371	1,438	305,610		307,048
Non-U.S. commercial	35	23	8	66	104,900		104,966
Commercial real estate [(6)]	144	19	119	282	62,407		62,689
Commercial lease financing	100	56	39	195	19,685		19,880
U.S. small business commercial	119	56	107	282	15,051		15,333
Total commercial	1,186	433	644	2,263	507,653		509,916
Commercial loans accounted for under the fair value option [(5)]						7,741	7,741
Total commercial loans and leases	1,186	433	644	2,263	507,653	7,741	517,657
Total loans and leases [(7)]	$ 4,052	$ 1,503	$ 3,819	$ 9,374	$ 965,717	$ 8,335	$ 983,426
Percentage of outstandings	0.41%	0.15%	0.39%	0.95%	98.20%	0.85%	100.00%

(1) Consumer real estate loans 30-59 days past due includes fully-insured loans of $517 million and nonperforming loans of $139 million. Consumer real estate loans 60-89 days past due includes fully-insured loans of $206 million and nonperforming loans of $114 million.
(2) Consumer real estate includes fully-insured loans of $1.1 billion.
(3) Consumer real estate includes $856 million and direct/indirect consumer includes $45 million of nonperforming loans.
(4) Total outstandings primarily includes auto and specialty lending loans and leases of $50.4 billion, U.S. securities-based lending loans of $36.7 billion and non-U.S. consumer loans of $2.8 billion.
(5) Consumer loans accounted for under the fair value option includes residential mortgage loans of $257 million and home equity loans of $337 million. Commercial loans accounted for under the fair value option includes U.S. commercial loans of $4.7 billion and non-U.S. commercial loans of $3.1 billion. For more information, see *Note 21 – Fair Value Measurements* and *Note 22 – Fair Value Option*.
(6) Total outstandings includes U.S. commercial real estate loans of $59.0 billion and non-U.S. commercial real estate loans of $3.7 billion.
(7) Total outstandings includes loans and leases pledged as collateral of $25.9 billion. The Corporation also pledged $168.2 billion of loans with no related outstanding borrowings to secure potential borrowing capacity with the Federal Reserve Bank and Federal Home Loan Bank.

(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]	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	757	309	2,201	3,267	11,595		14,862
Home equity	139	69	339	547	7,729		8,276
Credit card and other consumer							
Credit card	577	418	994	1,989	96,349		98,338
Direct/Indirect consumer [4]	317	90	40	447	90,719		91,166
Other consumer [5]	—	—	—	—	202		202
Total consumer	3,178	1,220	4,754	9,152	437,397		446,549
Consumer loans accounted for under the fair value option [6]						$ 682	682
Total consumer loans and leases	3,178	1,220	4,754	9,152	437,397	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 [7]	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 [6]						3,667	3,667
Total commercial loans and leases	831	465	720	2,016	493,981	3,667	499,664
Total loans and leases [8]	$ 4,009	$ 1,685	$ 5,474	$ 11,168	$ 931,378	$ 4,349	$ 946,895
Percentage of outstandings	0.42%	0.18%	0.58%	1.18%	98.36%	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) Total outstandings primarily includes auto and specialty lending loans and leases of $50.1 billion, U.S. securities-based lending loans of $37.0 billion and non-U.S. consumer loans of $2.9 billion.
(5) Substantially all of other consumer is consumer overdrafts.
(6) 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 more information, see *Note 21 – Fair Value Measurements* and *Note 22 – Fair Value Option*.
(7) 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.
(8) 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.

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 $7.5 billion and $6.1 billion at December 31, 2019 and 2018, 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 2019, the Corporation sold $4.7 billion of consumer real estate compared to $11.6 billion in 2018.

Nonperforming Loans and Leases

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 loans have not been otherwise modified. The Corporation continues to have a lien on the underlying collateral.

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, 2019 and 2018. 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)	**2019**	2018	**2019**	2018
Consumer real estate				
Core portfolio				
Residential mortgage [1]	**$ 883**	$ 1,010	**$ 176**	$ 274
Home equity	**363**	955	**—**	—
Non-core portfolio				
Residential mortgage [1]	**587**	883	**912**	1,610
Home equity	**173**	938	**—**	—
Credit card and other consumer				
Credit card	**n/a**	n/a	**1,042**	994
Direct/Indirect consumer	**47**	56	**33**	38
Total consumer	**2,053**	3,842	**2,163**	2,916
Commercial				
U.S. commercial	**1,094**	794	**106**	197
Non-U.S. commercial	**43**	80	**8**	—
Commercial real estate	**280**	156	**19**	4
Commercial lease financing	**32**	18	**20**	29
U.S. small business commercial	**50**	54	**97**	84
Total commercial	**1,499**	1,102	**250**	314
Total loans and leases	**$ 3,552**	$ 4,944	**$ 2,413**	$ 3,230

[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, 2019 and 2018, residential mortgage includes $740 million and $1.4 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 $348 million and $498 million 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, 2019 and 2018.

Consumer Real Estate – Credit Quality Indicators [(1)]

(Dollars in millions)	Core Residential Mortgage	Non-core Residential Mortgage	Core Home Equity	Non-core Home Equity	Core Residential Mortgage	Non-core Residential Mortgage	Core Home Equity	Non-core Home Equity
	December 31, 2019				December 31, 2018			
Refreshed LTV								
Less than or equal to 90 percent	$ 205,357	$ 7,433	$ 34,733	$ 4,127	$ 173,911	$ 10,272	$ 39,246	$ 6,478
Greater than 90 percent but less than or equal to 100 percent	3,100	273	226	348	2,349	533	354	715
Greater than 100 percent	1,049	267	267	507	817	545	410	1,083
Fully-insured loans [(2)]	16,264	2,426			16,618	3,512		
Total consumer real estate	$ 225,770	$ 10,399	$ 35,226	$ 4,982	$ 193,695	$ 14,862	$ 40,010	$ 8,276
Refreshed FICO score								
Less than 620	$ 2,127	$ 1,230	$ 751	$ 541	$ 2,125	$ 1,974	$ 1,064	$ 1,503
Greater than or equal to 620 and less than 680	4,821	1,053	1,550	800	4,538	1,719	2,008	1,720
Greater than or equal to 680 and less than 740	26,905	1,981	6,025	1,412	23,841	3,042	7,008	2,188
Greater than or equal to 740	175,653	3,709	26,900	2,229	146,573	4,615	29,930	2,865
Fully-insured loans [(2)]	16,264	2,426			16,618	3,512		
Total consumer real estate	$ 225,770	$ 10,399	$ 35,226	$ 4,982	$ 193,695	$ 14,862	$ 40,010	$ 8,276

(1) Excludes $594 million and $682 million of loans accounted for under the fair value option at December 31, 2019 and 2018.
(2) 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)	Credit Card	Direct/Indirect Consumer	Other Consumer	Credit Card	Direct/Indirect Consumer	Other Consumer
	December 31, 2019			December 31, 2018		
Refreshed FICO score						
Less than 620	$ 5,179	$ 1,720		$ 5,016	$ 1,719	
Greater than or equal to 620 and less than 680	12,277	2,734		12,415	3,124	
Greater than or equal to 680 and less than 740	35,301	8,460		35,781	8,921	
Greater than or equal to 740	44,851	37,825		45,126	36,709	
Other internal credit metrics [(1, 2)]		40,259	$ 192		40,693	$ 202
Total credit card and other consumer	$ 97,608	$ 90,998	$ 192	$ 98,338	$ 91,166	$ 202

(1) Other internal credit metrics may include delinquency status, geography or other factors.
(2) Direct/indirect consumer includes $39.6 billion and $39.9 billion of securities-based lending which is overcollateralized and therefore has minimal credit risk at December 31, 2019 and 2018.

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, 2019				
Risk ratings					
Pass rated	$ 299,380	$ 104,051	$ 61,598	$ 19,551	$ 231
Reservable criticized	7,668	915	1,091	329	18
Refreshed FICO score					
Less than 620					308
Greater than or equal to 620 and less than 680					756
Greater than or equal to 680 and less than 740					2,267
Greater than or equal to 740					4,607
Other internal credit metrics [(3)]					7,146
Total commercial	$ 307,048	$ 104,966	$ 62,689	$ 19,880	$ 15,333
	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					
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)]					6,873
Total commercial	$ 299,277	$ 98,776	$ 60,845	$ 22,534	$ 14,565

(1) Excludes $7.7 billion and $3.7 billion of loans accounted for under the fair value option at December 31, 2019 and 2018.
(2) At December 31, 2019 and 2018, U.S. small business commercial includes $715 million and $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. Refreshed FICO score and other internal credit metrics are applicable only to the U.S. small business commercial portfolio.
(3) Other internal credit metrics may include delinquency status, application scores, geography or other factors. At both December 31, 2019 and 2018, 99 percent of the balances where internal credit metrics are used were current or less than 30 days past due.

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. 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 of $632 million that have been discharged in Chapter 7 bankruptcy with no change in repayment terms and not reaffirmed by the borrower were included in TDRs at December 31, 2019, of which $101 million were classified as nonperforming and $275 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, 2019 and 2018, 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 $229 million and $244 million at December 31, 2019 and 2018. The carrying value of consumer real estate loans, including fully-insured loans, for which formal foreclosure proceedings were in process at December 31, 2019 was $1.6 billion. During 2019 and 2018, the Corporation reclassified $611 million and $670 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, 2019 and 2018 and the average carrying value and interest income recognized in 2019, 2018 and 2017 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, 2019			December 31, 2018		
With no recorded allowance						
Residential mortgage	$ 4,224	$ 3,354	$ —	$ 5,396	$ 4,268	$ —
Home equity	1,176	706	—	2,948	1,599	—
With an allowance recorded						
Residential mortgage	$ 1,426	$ 1,399	$ 70	$ 1,977	$ 1,929	$ 114
Home equity	543	523	69	812	760	144
Total						
Residential mortgage	$ 5,650	$ 4,753	$ 70	$ 7,373	$ 6,197	$ 114
Home equity	1,719	1,229	69	3,760	2,359	144

	Average Carrying Value	Interest Income Recognized [1]	Average Carrying Value	Interest Income Recognized [1]	Average Carrying Value	Interest Income Recognized [1]
	2019		2018		2017	
With no recorded allowance						
Residential mortgage	$ 3,831	$ 155	$ 5,424	$ 207	$ 7,737	$ 311
Home equity	1,221	76	1,894	105	1,997	109
With an allowance recorded						
Residential mortgage	$ 1,635	$ 62	$ 2,409	$ 91	$ 3,414	$ 123
Home equity	637	22	861	25	858	24
Total						
Residential mortgage	$ 5,466	$ 217	$ 7,833	$ 298	$ 11,151	$ 434
Home equity	1,858	98	2,755	130	2,855	133

[1] 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, 2019, 2018 and 2017 unpaid principal balance, carrying value, and average pre- and post-modification interest rates of consumer real estate loans that were modified in TDRs during 2019, 2018 and 2017. 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 2019, 2018 and 2017

(Dollars in millions)	Unpaid Principal Balance	Carrying Value	Pre-Modification Interest Rate	Post-Modification Interest Rate [1]
	December 31, 2019			
Residential mortgage	$ 464	$ 377	4.19%	4.13%
Home equity	141	101	5.04	4.31
Total	$ 605	$ 478	4.39	4.17
	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

[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, 2019, 2018 and 2017 carrying value for consumer real estate loans that were modified in a TDR during 2019, 2018 and 2017, by type of modification.

Consumer Real Estate – Modification Programs

(Dollars in millions)	TDRs Entered into During 2019	2018	2017
Modifications under government programs [1]	**$ 35**	$ 61	$ 85
Modifications under proprietary programs [1]	**174**	523	437
Loans discharged in Chapter 7 bankruptcy [2]	**68**	130	211
Trial modifications	**201**	285	569
Total modifications	**$ 478**	$ 999	$ 1,302

(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; there were no such modifications in 2019 or 2017. These modifications were 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 2019, 2018 and 2017 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)	2019	2018	2017
Modifications under government programs	**$ 26**	$ 39	$ 81
Modifications under proprietary programs	**88**	158	138
Loans discharged in Chapter 7 bankruptcy [1]	**30**	64	116
Trial modifications [2]	**57**	107	391
Total modifications	**$ 201**	$ 368	$ 726

(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 following table provides the unpaid principal balance, carrying value and related allowance at December 31, 2019 and 2018 and the average carrying value for 2019, 2018 and 2017 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, 2019			December 31, 2018			**2019**	2018	2017
With no recorded allowance									
Direct/Indirect consumer	**$ 73**	**$ 32**	**$ —**	$ 72	$ 33	$ —	**$ 33**	$ 30	$ 21
With an allowance recorded									
Credit card [3]	**$ 633**	**$ 647**	**$ 188**	$ 522	$ 533	$ 154	**$ 594**	$ 491	$ 511

(1) Includes accrued interest and fees.
(2) The related interest income recognized, which 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 was considered collectible, was not significant in 2019, 2018 and 2017.
(3) The average carrying value in 2017 includes $47 million related to the non-U.S. credit card portfolio, which was sold in the second quarter of 2017.

The table below provides information on the Corporation's primary modification programs for the Credit Card and Other Consumer TDR portfolio at December 31, 2019 and 2018.

Credit Card and Other Consumer – TDRs by Program Type at December 31

	Credit Card		Direct/Indirect Consumer		Total TDRs by Program Type	
(Dollars in millions)	2019	2018	2019	2018	2019	2018
Internal programs	$ 339	$ 259	$ —	$ —	$ 339	$ 259
External programs	308	273	—	—	308	273
Other	—	1	32	33	32	34
Total	**$ 647**	$ 533	**$ 32**	$ 33	**$ 679**	$ 566
Percent of balances current or less than 30 days past due	**85%**	85%	**78%**	81%	**84%**	85%

The table below provides information on the Corporation's Credit Card and Other Consumer TDR portfolio including the December 31, 2019, 2018 and 2017 unpaid principal balance, carrying value, and average pre- and post-modification interest rates of loans that were modified in TDRs during 2019, 2018 and 2017.

Credit Card and Other Consumer – TDRs Entered into During 2019, 2018 and 2017

(Dollars in millions)	Unpaid Principal Balance	Carrying Value [(1)]	Pre-Modification Interest Rate	Post-Modification Interest Rate
	December 31, 2019			
Credit card	**$ 340**	**$ 355**	**19.18%**	**5.35%**
Direct/Indirect consumer	**40**	**21**	**5.23**	**5.21**
Total	**$ 380**	**$ 376**	**18.42**	**5.34**
	December 31, 2018			
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			
Credit card	$ 203	$ 213	18.47%	5.32%
Non-U.S. credit card	37	22	4.81	4.30
Total	$ 240	$ 235	17.17	5.22

(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 14 percent of new credit card TDRs and 20 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, 2019 and 2018, remaining commitments to lend additional funds to debtors whose terms have been modified in a commercial loan TDR were $445 million and $297 million. The balance of commercial TDRs in payment default was not significant at December 31, 2019 and 2018.

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, 2019 and 2018, and the average carrying value for 2019, 2018 and 2017. 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, 2019			December 31, 2018			2019	2018	2017
With no recorded allowance									
U.S. commercial	$ 534	$ 520	$ —	$ 638	$ 616	$ —	$ 635	$ 655	$ 772
Non-U.S. commercial	123	123	—	93	93	—	79	43	46
Commercial real estate	67	58	—	—	—	—	96	44	69
Commercial lease financing	12	12	—	—	—	—	5	3	—
With an allowance recorded									
U.S. commercial	$ 1,776	$ 1,574	$ 216	$ 1,437	$ 1,270	$ 121	$ 1,316	$ 1,162	$ 1,260
Non-U.S. commercial	113	113	9	155	149	30	218	327	463
Commercial real estate	322	236	64	247	162	16	149	46	73
Commercial lease financing	57	51	1	71	71	—	73	42	8
U.S. small business commercial [(2)]	91	77	30	83	72	29	75	73	73
Total									
U.S. commercial	$ 2,310	$ 2,094	$ 216	$ 2,075	$ 1,886	$ 121	$ 1,951	$ 1,817	$ 2,032
Non-U.S. commercial	236	236	9	248	242	30	297	370	509
Commercial real estate	389	294	64	247	162	16	245	90	142
Commercial lease financing	69	63	1	71	71	—	78	45	8
U.S. small business commercial [(2)]	91	77	30	83	72	29	75	73	73

(1) The related interest income recognized, which 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 was considered collectible, was not significant in 2019, 2018 and 2017.
(2) Includes U.S. small business commercial renegotiated TDR loans and related allowance.

Loans Held-for-sale

The Corporation had LHFS of $9.2 billion and $10.4 billion at December 31, 2019 and 2018. Cash and non-cash proceeds from sales and paydowns of loans originally classified as LHFS were $30.6 billion, $29.2 billion and $41.3 billion for 2019, 2018 and 2017, respectively. Cash used for originations and purchases of LHFS totaled $28.9 billion, $28.1 billion and $43.5 billion for 2019, 2018 and 2017, respectively.

NOTE 6 Allowance for Credit Losses

The table below summarizes the changes in the allowance for credit losses by portfolio segment for 2019, 2018 and 2017.

(Dollars in millions)	Consumer Real Estate	Credit Card and Other Consumer	Commercial	Total
		2019		
Allowance for loan and lease losses, January 1	**$ 928**	**$ 3,874**	**$ 4,799**	**$ 9,601**
Loans and leases charged off	**(522)**	**(4,302)**	**(822)**	**(5,646)**
Recoveries of loans and leases previously charged off	**927**	**911**	**160**	**1,998**
Net charge-offs	**405**	**(3,391)**	**(662)**	**(3,648)**
Provision for loan and lease losses	**(680)**	**3,512**	**742**	**3,574**
Other [(1)]	**(107)**	**1**	**(5)**	**(111)**
Allowance for loan and lease losses, December 31	**546**	**3,996**	**4,874**	**9,416**
Reserve for unfunded lending commitments, January 1	**—**	**—**	**797**	**797**
Provision for unfunded lending commitments	**—**	**—**	**16**	**16**
Reserve for unfunded lending commitments, December 31	**—**	**—**	**813**	**813**
Allowance for credit losses, December 31	**$ 546**	**$ 3,996**	**$ 5,687**	**$ 10,229**
		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)
Provision for loan and lease losses	(492)	3,441	313	3,262
Other [(1)]	(274)	(16)	(1)	(291)
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)
Provision for loan and lease losses	(710)	3,437	654	3,381
Other [(1)]	(207)	(38)	(1)	(246)
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

(1) Primarily represents write-offs of purchased credit-impaired loans, the net impact of portfolio sales, and transfers to LHFS.

The table below presents the allowance and the carrying value of outstanding loans and leases by portfolio segment at December 31, 2019 and 2018.

(Dollars in millions)	Consumer Real Estate	Credit Card and Other Consumer	Commercial	Total
	December 31, 2019			
Impaired loans and troubled debt restructurings [1]				
Allowance for loan and lease losses	$ 139	$ 188	$ 320	$ 647
Carrying value [2]	5,982	679	2,764	9,425
Allowance as a percentage of carrying value	2.32%	27.69%	11.58%	6.86%
Loans collectively evaluated for impairment				
Allowance for loan and lease losses	$ 407	$ 3,808	$ 4,554	$ 8,769
Carrying value [2, 3]	270,395	188,119	507,152	965,666
Allowance as a percentage of carrying value [3]	0.15%	2.02%	0.90%	0.91%
Total				
Allowance for loan and lease losses	$ 546	$ 3,996	$ 4,874	$ 9,416
Carrying value [2, 3]	276,377	188,798	509,916	975,091
Allowance as a percentage of carrying value [3]	0.20%	2.12%	0.96%	0.97%
	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	$ 670	$ 3,720	$ 4,603	$ 8,993
Carrying value [2, 3]	248,287	189,140	493,564	930,991
Allowance as a percentage of carrying value [3]	0.27%	1.97%	0.93%	0.97%
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%

(1) Impaired loans include nonperforming commercial loans and leases, as well as 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 $8.3 billion and $4.3 billion at December 31, 2019 and 2018.

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, 2019 and 2018 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, 2019 and 2018 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 in connection with its funding activities.

The Corporation did not provide financial support to consolidated or unconsolidated VIEs during 2019, 2018 and 2017 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 $1.1 billion and $218 million at December 31, 2019 and 2018.

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 GSEs, 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 13 – 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 2019, 2018 and 2017.

First-lien Mortgage Securitizations

	Residential Mortgage - Agency			Commercial Mortgage		
(Dollars in millions)	**2019**	2018	2017	**2019**	2018	2017
Proceeds from loan sales [(1)]	**$ 6,858**	$ 5,801	$ 16,161	**$ 8,661**	$ 6,991	$ 5,887
Gains on securitizations [(2)]	**27**	62	158	**103**	101	91
Repurchases from securitization trusts [(3)]	**881**	1,485	2,713	**—**	—	—

(1) The Corporation transfers residential mortgage loans to securitizations sponsored primarily by the GSEs or GNMA in the normal course of business and primarily receives RMBS in exchange. Substantially all of these securities are classified as Level 2 within the fair value hierarchy and are sold shortly after receipt.

(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 $64 million, $71 million and $243 million, net of hedges, during 2019, 2018 and 2017, 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.

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 $192.1 billion and $226.6 billion at December 31, 2019 and 2018. Servicing fee and ancillary fee income on serviced loans was $585 million, $710 million and $893 million during 2019, 2018 and 2017. Servicing advances on serviced loans, including loans serviced for others and loans held for investment, were $2.4 billion and $3.3 billion at December 31, 2019 and 2018. For more information on MSRs, see *Note 21 – Fair Value Measurements*.

During 2019, the Corporation deconsolidated agency residential mortgage securitization trusts with total assets of $1.2 billion. There were no significant deconsolidations in 2018 or 2017.

The following table summarizes select information related to first-lien mortgage securitization trusts in which the Corporation held a variable interest at December 31, 2019 and 2018.

First-lien Mortgage VIEs

	Residential Mortgage									
			Non-agency							
	Agency		Prime		Subprime		Alt-A		Commercial Mortgage	
	December 31									
(Dollars in millions)	**2019**	2018	**2019**	2018	**2019**	2018	**2019**	2018	**2019**	2018
Unconsolidated VIEs										
Maximum loss exposure [(1)]	**$ 12,554**	$ 16,011	**$ 340**	$ 448	**$ 1,622**	$ 1,897	**$ 98**	$ 217	**$ 1,036**	$ 767
On-balance sheet assets										
Senior securities:										
Trading account assets	**$ 627**	$ 460	**$ 5**	$ 30	**$ 54**	$ 36	**$ 24**	$ 90	**$ 65**	$ 97
Debt securities carried at fair value	**6,392**	9,381	**193**	246	**1,178**	1,470	**72**	125	**—**	—
Held-to-maturity securities	**5,535**	6,170	**—**	—	**—**	—	**—**	—	**809**	528
All other assets	**—**	—	**2**	3	**49**	37	**2**	2	**38**	40
Total retained positions	**$ 12,554**	$ 16,011	**$ 200**	$ 279	**$ 1,281**	$ 1,543	**$ 98**	$ 217	**$ 912**	$ 665
Principal balance outstanding [(2)]	**$ 160,226**	$ 187,512	**$ 7,268**	$ 8,954	**$ 8,594**	$ 8,719	**$ 19,878**	$ 23,467	**$ 60,129**	$ 43,593
Consolidated VIEs										
Maximum loss exposure [(1)]	**$ 10,857**	$ 13,296	**$ 5**	$ 7	**$ 44**	$ —	**$ —**	$ —	**$ —**	$ 76
On-balance sheet assets										
Trading account assets	**$ 780**	$ 1,318	**$ 116**	$ 150	**$ 149**	$ —	**$ —**	$ —	**$ —**	$ 76
Loans and leases, net	**9,917**	11,858	**—**	—	**—**	—	**—**	—	**—**	—
All other assets	**161**	143	**—**	—	**—**	—	**—**	—	**—**	—
Total assets	**$ 10,858**	$ 13,319	**$ 116**	$ 150	**$ 149**	$ —	**$ —**	$ —	**$ —**	$ 76
Total liabilities	**$ 4**	$ 26	**$ 111**	$ 143	**$ 105**	$ —	**$ —**	$ —	**$ —**	—

(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 more information, see *Note 13 – Commitments and Contingencies* and *Note 21 – 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 following table 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, 2019 and 2018.

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)	2019	2018	2019	2018	2019	2018	2019	2018
Unconsolidated VIEs								
Maximum loss exposure	$ 412	$ 908	$ —	$ —	$ 7,526	$ 7,647	$ 3,701	$ 2,150
On-balance sheet assets								
Senior securities [4]:								
Trading account assets	$ —	$ —	$ —	$ —	$ 2,188	$ 1,419	$ —	$ 26
Debt securities carried at fair value	11	27	—	—	1,126	1,337	—	—
Held-to-maturity securities	—	—	—	—	4,212	4,891	—	—
Total retained positions	$ 11	$ 27	$ —	$ —	$ 7,526	$ 7,647	$ —	$ 26
Total assets of VIEs [5]	$ 1,023	$ 1,813	$ —	$ —	$ 21,234	$ 16,949	$ 4,395	$ 2,829
Consolidated VIEs								
Maximum loss exposure	$ 64	$ 85	$ 17,915	$ 18,800	$ 54	$ 128	$ 2,656	$ 1,540
On-balance sheet assets								
Trading account assets	$ —	$ —	$ —	$ —	$ 73	$ 366	$ 2,480	$ 1,553
Loans and leases	122	133	26,985	29,906	—	—	—	—
Allowance for loan and lease losses	(2)	(5)	(800)	(901)	—	—	—	—
All other assets	3	4	119	136	—	—	176	1
Total assets	$ 123	$ 132	$ 26,304	$ 29,141	$ 73	$ 366	$ 2,656	$ 1,554
On-balance sheet liabilities								
Short-term borrowings	$ —	$ —	$ —	$ —	$ —	$ —	$ 2,175	$ 742
Long-term debt	64	55	8,372	10,321	19	238	—	12
All other liabilities	—	—	17	20	—	—	—	—
Total liabilities	$ 64	$ 55	$ 8,389	$ 10,341	$ 19	$ 238	$ 2,175	$ 754

[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 more information, see *Note 13 – Commitments and Contingencies*.

[2] At December 31, 2019 and 2018, loans and leases in the consolidated credit card trust included $10.5 billion and $11.0 billion of seller's interest.

[3] At December 31, 2019 and 2018, all other assets in the consolidated credit card trust included unbilled accrued interest and fees.

[4] The retained senior 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, primarily senior securities, in home equity securitization trusts 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.

During 2019, 2018 and 2017, new senior debt securities issued to third-party investors from the credit card securitization trust were $1.3 billion, $4.0 billion and $3.1 billion, respectively.

At December 31, 2019 and 2018, the Corporation held subordinate securities issued by the credit card securitization trust with a notional principal amount of $7.4 billion and $7.7 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 2019, 2018 and 2017, the credit card securitization trust issued $202 million, $650 million and $500 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 $24.4 billion, $22.8 billion and $25.1 billion of securities during 2019, 2018 and 2017, respectively. Securities transferred into resecuritization VIEs were measured at fair value with changes in fair value recorded in market making and similar activities prior to the resecuritization and, accordingly, no gain or loss on sale was recorded. During 2019, 2018 and 2017, resecuritization proceeds included securities with an initial fair value of $5.2 billion, $4.1 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 $3.7 billion and $2.1 billion at December 31, 2019 and 2018. The weighted-average remaining life of bonds held in the trusts at December 31, 2019 was 10.0 years. There were no significant write-downs or downgrades of assets or issuers during 2019, 2018 and 2017.

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, 2019 and 2018.

Other VIEs

	Consolidated	Unconsolidated	Total	Consolidated	Unconsolidated	Total
	December 31					
(Dollars in millions)	2019			2018		
Maximum loss exposure	$ 4,055	$ 26,326	$ 30,381	$ 4,177	$ 24,498	$ 28,675
On-balance sheet assets						
Trading account assets	$ 2,213	$ 549	$ 2,762	$ 2,335	$ 860	$ 3,195
Debt securities carried at fair value	—	74	74	—	84	84
Loans and leases	1,810	3,214	5,024	1,949	3,940	5,889
Allowance for loan and lease losses	(2)	(38)	(40)	(2)	(30)	(32)
All other assets	81	20,547	20,628	53	18,885	18,938
Total	$ 4,102	$ 24,346	$ 28,448	$ 4,335	$ 23,739	$ 28,074
On-balance sheet liabilities						
Long-term debt	$ 46	$ —	$ 46	$ 152	$ —	$ 152
All other liabilities	2	5,087	5,089	7	4,231	4,238
Total	$ 48	$ 5,087	$ 5,135	$ 159	$ 4,231	$ 4,390
Total assets of VIEs	$ 4,102	$ 98,491	$ 102,593	$ 4,335	$ 94,746	$ 99,081

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 $2.2 billion and $2.1 billion at December 31, 2019 and 2018, 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 $304 million and $421 million at December 31, 2019 and 2018.

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, 2019 and 2018, the Corporation's consolidated investment VIEs had total assets of $104 million and $270 million. The Corporation also held investments in unconsolidated VIEs with total assets of $32.4 billion and $37.7 billion at December 31, 2019 and 2018. The Corporation's maximum loss exposure associated with both consolidated and unconsolidated investment VIEs totaled $6.4 billion and $7.2 billion at December 31, 2019 and 2018 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 $1.7 billion and $1.8 billion at December 31, 2019 and 2018. 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 $18.9 billion and $17.0 billion at December 31, 2019 and 2018. 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 $10.0 billion and $8.9 billion, including unfunded commitments to provide capital contributions of $4.3 billion and $3.8 billion at December 31, 2019 and 2018. The unfunded commitments are expected to be paid over the next five years. During 2019, 2018 and 2017, the Corporation recognized tax credits and other tax benefits from investments in affordable housing partnerships of $1.0 billion, $981 million and $1.0 billion and reported pretax losses in other income of $882 million, $798 million and $766 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 business segment and *All Other* at December 31, 2019 and 2018. The reporting units utilized for goodwill impairment testing are the operating segments or one level below.

Goodwill

(Dollars in millions)	December 31 2019	2018
Consumer Banking	$ 30,123	$ 30,123
Global Wealth & Investment Management	9,677	9,677
Global Banking	23,923	23,923
Global Markets	5,182	5,182
All Other	46	46
Total goodwill	$ 68,951	$ 68,951

During 2019, the Corporation completed its annual goodwill impairment test as of June 30, 2019 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

At December 31, 2019 and 2018, the net carrying value of intangible assets was $1.7 billion and $1.8 billion. At December 31, 2019 and 2018, intangible assets included $1.6 billion of intangible assets associated with trade names, substantially all of which had an indefinite life and, accordingly, are not being amortized. Amortization of intangibles expense was $112 million, $538 million and $621 million for 2019, 2018 and 2017, respectively.

NOTE 9 Leases

The Corporation enters into both lessor and lessee arrangements. For more information on lease accounting, see *Note 1 – Summary of Significant Accounting Principles*, and on lease financing receivables, see *Note 5 – Outstanding Loans and Leases*.

Lessor Arrangements

The Corporation's lessor arrangements primarily consist of operating, sales-type and direct financing leases for equipment. Lease agreements may include options to renew and for the lessee to purchase the leased equipment at the end of the lease term.

At December 31, 2019, the total net investment in sales-type and direct financing leases was $21.9 billion, comprised of $19.3 billion in lease receivables and $2.6 billion in unguaranteed residuals. In certain cases, the Corporation obtains third-party residual value insurance to reduce its residual asset risk. The carrying value of residual assets with third-party residual value insurance for at least a portion of the asset value was $5.8 billion.

For 2019, total lease income was $1.7 billion, consisting of $797 million from sales-type and direct financing leases and $891 million from operating leases.

Lessee Arrangements

The Corporation's lessee arrangements predominantly consist of operating leases for premises and equipment; the Corporation's financing leases are not significant. Right-of-use assets were $9.7 billion and lease liabilities were $10.1 billion at December 31, 2019. The weighted-average discount rate used to calculate the present value of future minimum lease payments was four percent.

Lease terms may contain renewal and extension options and early termination features. Generally, these options do not impact the lease term because the Corporation is not reasonably certain that it will exercise the options. The weighted-average lease term was 8.2 years at December 31, 2019.

The table below provides the components of lease cost and supplemental information for 2019.

Lease Cost and Supplemental Information for 2019

(Dollars in millions)	
Operating lease cost	$ 2,085
Variable lease cost [1]	498
Total lease cost [2]	$ 2,583
Right-of-use assets obtained in exchange for new operating lease liabilities [3]	$ 931
Operating cash flows from operating leases [4]	2,009

(1) Primarily consists of payments for common area maintenance and property taxes.
(2) Amounts are recorded in occupancy and equipment expense in the Consolidated Statement of Income.
(3) Represents non-cash activity and, accordingly, is not reflected in the Consolidated Statement of Cash Flows.
(4) Represents cash paid for amounts included in the measurement of lease liabilities.

Maturity Analysis

The maturities of lessor and lessee arrangements outstanding at December 31, 2019 are presented in the table below based on undiscounted cash flows.

Maturities of Lessor and Lessee Arrangements

	Lessor		Lessee [1]
	Operating Leases	Sales-type and Direct Financing Leases [2]	Operating Leases
(Dollars in millions)	December 31, 2019		
2020	$ 843	$ 4,657	$ 1,966
2021	746	4,887	1,763
2022	651	4,259	1,502
2023	530	3,416	1,240
2024	397	1,939	1,098
Thereafter	1,057	1,910	4,225
Total undiscounted cash flows	$ 4,224	21,068	11,794
Less: Net present value adjustment		1,756	1,701
Total [3]		$ 19,312	$ 10,093

(1) Excludes $1.5 billion in commitments under lessee arrangements that have not yet commenced with lease terms that will begin in 2020.
(2) Includes $15.1 billion in commercial lease financing receivables and $4.2 billion in direct/indirect consumer lease financing receivables.
(3) Represents lease receivables for lessor arrangements and lease liabilities for lessee arrangements.

At December 31, 2018, operating lease commitments under lessee arrangements were $2.4 billion, $2.2 billion, $2.0 billion, $1.7 billion and $1.3 billion for 2019 through 2023, respectively, and $6.2 billion in the aggregate for all years thereafter. These amounts include variable lease payments and commitments under leases that have not yet commenced, both of which are excluded from the lessee maturity analysis presented in the table above.

NOTE 10 Deposits

The table below presents information about the Corporation's time deposits of $100 thousand or more at December 31, 2019 and 2018. The Corporation also had aggregate time deposits of $15.8 billion and $16.4 billion in denominations that met or exceeded the Federal Deposit Insurance Corporation (FDIC) insurance limit at December 31, 2019 and 2018.

Time Deposits of $100 Thousand or More

	December 31, 2019				December 31 2018
(Dollars in millions)	Three Months or Less	Over Three Months to Twelve Months	Thereafter	Total	Total
U.S. certificates of deposit and other time deposits	$ 16,115	$ 21,351	$ 2,273	$ 39,739	$ 29,505
Non-U.S. certificates of deposit and other time deposits	7,108	4,821	1,105	13,034	10,792

The scheduled contractual maturities for total time deposits at December 31, 2019 are presented in the table below.

Contractual Maturities of Total Time Deposits

(Dollars in millions)	U.S.	Non-U.S.	Total
Due in 2020	$ 56,351	$ 12,000	$ 68,351
Due in 2021	3,503	101	3,604
Due in 2022	990	18	1,008
Due in 2023	280	15	295
Due in 2024	187	981	1,168
Thereafter	212	35	247
Total time deposits	$ 61,523	$ 13,150	$ 74,673

NOTE 11 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 22 – Fair Value Option*.

	Amount	Rate	Amount	Rate
(Dollars in millions)	2019		2018	
Federal funds sold and securities borrowed or purchased under agreements to resell				
Average during year	$ 279,610	1.73%	$ 251,328	1.26%
Maximum month-end balance during year	281,684	n/a	279,350	n/a
Federal funds purchased and securities loaned or sold under agreements to repurchase				
Average during year	$ 201,797	2.31%	$ 193,681	1.80%
Maximum month-end balance during year	203,063	n/a	201,089	n/a
Short-term borrowings				
Average during year	24,301	2.42	36,021	2.69
Maximum month-end balance during year	36,538	n/a	52,480	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 $11.7 billion and $12.1 billion at December 31, 2019 and 2018. These short-term bank notes, along with Federal Home Loan Bank 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 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, 2019 and 2018. 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, 2019				
Securities borrowed or purchased under agreements to resell [3]	$ 434,257	$ (159,660)	$ 274,597	$ (244,486)	$ 30,111
Securities loaned or sold under agreements to repurchase	$ 324,769	$ (159,660)	$ 165,109	$ (141,482)	$ 23,627
Other [4]	15,346	—	15,346	(15,346)	—
Total	$ 340,115	$ (159,660)	$ 180,455	$ (156,828)	$ 23,627
	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

[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 $12.9 billion and $11.5 billion reported in loans and leases on the Consolidated Balance Sheet at December 31, 2019 and 2018.
[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, 2019				
Securities sold under agreements to repurchase	$ 129,455	$ 122,685	$ 25,322	$ 21,922	$ 299,384
Securities loaned	18,766	3,329	1,241	2,049	25,385
Other	15,346	—	—	—	15,346
Total	$ 163,567	$ 126,014	$ 26,563	$ 23,971	$ 340,115
	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

[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, 2019			
U.S. government and agency securities	$ 173,533	$ 1	$ —	$ 173,534
Corporate securities, trading loans and other	10,467	2,014	258	12,739
Equity securities	14,933	20,026	15,024	49,983
Non-U.S. sovereign debt	96,576	3,344	64	99,984
Mortgage trading loans and ABS	3,875	—	—	3,875
Total	$ 299,384	$ 25,385	$ 15,346	$ 340,115
	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

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, 2019 and 2018, the Corporation held restricted cash included within cash and cash equivalents on the Consolidated Balance Sheet of $24.4 billion and $22.6 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 12 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, 2019 and 2018, and the related contractual rates and maturity dates as of December 31, 2019.

(Dollars in millions)	Weighted-average Rate	Interest Rates	Maturity Dates	December 31 2019	December 31 2018
Notes issued by Bank of America Corporation [1]					
Senior notes:					
Fixed	3.30 %	0.25 - 8.05 %	2020 - 2050	$ 140,265	$ 120,548
Floating	1.81	0.25 - 6.68	2020 - 2044	19,552	25,574
Senior structured notes				16,941	13,815
Subordinated notes:					
Fixed	4.89	2.94 - 8.57	2021 - 2045	21,632	20,843
Floating	2.74	2.56 - 2.89	2022 - 2026	782	1,742
Junior subordinated notes:					
Fixed	6.71	6.45 - 8.05	2027 - 2066	736	732
Floating [2]	2.71	2.71	2056	1	1
Total notes issued by Bank of America Corporation				199,909	183,255
Notes issued by Bank of America, N.A.					
Senior notes:					
Fixed	3.34	3.34	2023	508	—
Floating	2.18	1.99 - 2.51	2020 - 2041	6,519	1,770
Subordinated notes	6.00	6.00	2036	1,744	1,617
Advances from Federal Home Loan Banks:					
Fixed	4.98	0.01 - 7.72	2020 - 2034	112	130
Floating	1.79	1.77 - 1.84	2020	2,500	14,751
Securitizations and other BANA VIEs [3]				8,373	10,326
Other				402	442
Total notes issued by Bank of America, N.A.				20,158	29,036
Other debt					
Structured liabilities				20,442	16,483
Nonbank VIEs [3]				347	618
Total other debt				20,789	17,101
Total long-term debt				$ 240,856	$ 229,392

[1] Includes total loss-absorbing capacity compliant debt.
[2] Includes amounts related to trust preferred securities. For more information, see Trust Preferred Securities in this Note.
[3] Represents liabilities of consolidated VIEs included in total long-term debt on the Consolidated Balance Sheet.

During 2019, the Corporation issued $52.5 billion of long-term debt consisting of $29.3 billion of notes issued by Bank of America Corporation, $10.9 billion of notes issued by Bank of America, N.A. and $12.3 billion of other debt, substantially all of which was structured liabilities. During 2018, the Corporation issued $64.4 billion of long-term debt consisting of $30.7 billion of notes issued by Bank of America Corporation, $18.7 billion of notes issued by Bank of America, N.A. and $15.0 billion of other debt, substantially all of which was structured liabilities.

During 2019, the Corporation had total long-term debt maturities and redemptions in the aggregate of $50.6 billion consisting of $21.1 billion for Bank of America Corporation, $19.9 billion for Bank of America, N.A. and $9.6 billion of other debt. 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.

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, 2019 and 2018, the amount of foreign currency-denominated debt translated into U.S. dollars included in total long-term debt was $49.6 billion and $48.6 billion. Foreign currency contracts may be used to convert certain foreign currency-denominated debt into U.S. dollars.

At December 31, 2019, long-term debt of consolidated VIEs in the table above included debt from credit card, residential mortgage, home equity, other VIEs and ABS of $8.4 billion, $217 million, $64 million, $46 million and $19 million, respectively. Long-term debt of VIEs is collateralized by the assets of the VIEs. For more 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 3.26 percent, 3.55 percent and 1.92 percent, respectively, at December 31, 2019, and 3.29 percent, 3.66 percent and 2.26 percent, respectively, at December 31, 2018. 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 $5.7 billion at December 31, 2019 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.

The table below shows the carrying value for aggregate annual contractual maturities of long-term debt as of December 31, 2019. 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)	2020	2021	2022	2023	2024	Thereafter	Total
Bank of America Corporation							
Senior notes	$ 9,312	$ 15,978	$ 14,875	$ 23,045	$ 17,236	$ 79,371	**$ 159,817**
Senior structured notes	822	453	2,232	288	547	12,599	**16,941**
Subordinated notes	—	360	386	—	3,213	18,455	**22,414**
Junior subordinated notes [(1)]	—	—	—	—	—	737	**737**
Total Bank of America Corporation	10,134	16,791	17,493	23,333	20,996	111,162	**199,909**
Bank of America, N.A.							
Senior notes	3,000	3,499	—	509	—	19	**7,027**
Subordinated notes	—	—	—	—	—	1,744	**1,744**
Advances from Federal Home Loan Banks	2,509	2	3	1	—	97	**2,612**
Securitizations and other Bank VIEs [(2)]	3,099	4,080	1,185	9	—	—	**8,373**
Other	134	55	—	130	—	83	**402**
Total Bank of America, N.A.	8,742	7,636	1,188	649	—	1,943	**20,158**
Other debt							
Structured liabilities	5,275	1,884	1,057	1,372	745	10,109	**20,442**
Nonbank VIEs [(2)]	—	—	—	1	—	346	**347**
Total other debt	5,275	1,884	1,057	1,373	745	10,455	**20,789**
Total long-term debt	**$ 24,151**	**$ 26,311**	**$ 19,738**	**$ 25,355**	**$ 21,741**	**$ 123,560**	**$ 240,856**

(1) Includes amounts related to trust preferred securities. For more information, see Trust Preferred Securities in this Note.
(2) Represents liabilities of consolidated VIEs included in total long-term debt on the Consolidated Balance Sheet.

Trust Preferred Securities

At December 31, 2019, trust preferred securities (Trust Securities) with a carrying value of $1 million, issued by BAC Capital Trust XV (the Trust), a 100 percent owned, non-consolidated finance subsidiary of the Corporation, were issued and outstanding. The Trust Securities are mandatorily redeemable preferred security obligations of the Trust. The sole asset of the Trust is a junior subordinated deferrable interest note of the Corporation (the Note).

Periodic cash payments and payments upon liquidation or redemption with respect to Trust Securities are guaranteed by the Corporation to the extent of funds held by the Trust (the Preferred Securities Guarantee). The Preferred Securities Guarantee, when taken together with the Corporation's other obligations including its obligations under the Note, generally will constitute a full and unconditional guarantee, on a subordinated basis, by the Corporation of payments due on the Trust Securities.

NOTE 13 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 $10.6 billion and $10.7 billion at December 31, 2019 and 2018. At December 31, 2019, the carrying value of these commitments, excluding commitments accounted for under the fair value option, was $829 million, including deferred revenue of $16 million and a reserve for unfunded lending commitments of $813 million. At December 31, 2018, the comparable amounts were $813 million, $16 million and $797 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 includes the notional amount of commitments of $4.4 billion and $3.1 billion at December 31, 2019 and 2018 that are accounted for under the fair value option. However, the table excludes cumulative net fair value of $90 million and $169 million at December 31, 2019 and 2018 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 22 – 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, 2019		
Notional amount of credit extension commitments					
Loan commitments (1)	**$ 97,454**	**$ 148,000**	**$ 173,699**	**$ 24,487**	**$ 443,640**
Home equity lines of credit	**1,137**	**1,948**	**6,351**	**34,134**	**43,570**
Standby letters of credit and financial guarantees (2)	**21,311**	**11,512**	**3,712**	**408**	**36,943**
Letters of credit (3)	**1,156**	**254**	**65**	**25**	**1,500**
Legally binding commitments	**121,058**	**161,714**	**183,827**	**59,054**	**525,653**
Credit card lines (4)	**376,067**	**—**	**—**	**—**	**376,067**
Total credit extension commitments	**$ 497,125**	**$ 161,714**	**$ 183,827**	**$ 59,054**	**$ 901,720**
			December 31, 2018		
Notional amount of credit extension commitments					
Loan commitments (1)	$ 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 (2)	22,571	9,702	2,457	1,074	35,804
Letters of credit (3)	1,168	84	69	57	1,378
Legally binding commitments	111,227	154,306	161,354	58,516	485,403
Credit card lines (4)	371,658	—	—	—	371,658
Total credit extension commitments	$ 482,885	$ 154,306	$ 161,354	$ 58,516	$ 857,061

(1) At December 31, 2019 and 2018, $5.1 billion and $4.3 billion of these loan commitments are held in the form of a security.
(2) 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 $27.9 billion and $8.6 billion at December 31, 2019, and $28.3 billion and $7.1 billion at December 31, 2018. Amounts in the table include consumer SBLCs of $413 million and $372 million at December 31, 2019 and 2018.
(3) At December 31, 2019 and 2018, included are letters of credit of $1.4 billion and $422 million related to certain liquidity commitments of VIEs. For more information, see *Note 7 – Securitizations and Other Variable Interest Entities*.
(4) Includes business card unused lines of credit.

Other Commitments

At December 31, 2019 and 2018, the Corporation had commitments to purchase loans (e.g., residential mortgage and commercial real estate) of $86 million and $329 million, which upon settlement will be included in loans or LHFS, and commitments to purchase commercial loans of $1.1 billion and $463 million, which upon settlement will be included in trading account assets.

At December 31, 2019 and 2018, the Corporation had commitments to purchase commodities, primarily liquefied natural gas, of $830 million and $1.3 billion, which upon settlement will be included in trading account assets.

At December 31, 2019 and 2018, the Corporation had commitments to enter into resale and forward-dated resale and securities borrowing agreements of $97.2 billion and $59.7 billion, and commitments to enter into forward-dated repurchase and securities lending agreements of $24.9 billion and $21.2 billion. These commitments expire primarily within the next 12 months.

At December 31, 2019 and 2018, the Corporation had a commitment to originate or purchase up to $3.3 billion and $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.

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, 2019 and 2018, the notional amount of these guarantees totaled $7.3 billion and $9.8 billion. At December 31, 2019 and 2018, the Corporation's maximum exposure related to these guarantees totaled $1.1 billion and $1.5 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 a merchant processor fails to meet its obligation regarding

disputed transactions, then the Corporation could be held liable. In 2019 and 2018, the sponsored entities processed $916.6 billion and $874.3 billion of transactions and recorded losses of $24 million and $31 million.

At December 31, 2019 and 2018, the maximum potential exposure for sponsored transactions totaled $384.2 billion and $348.1 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.

A significant portion of the Corporation's merchant processing activity is performed by a joint venture, formed in 2009, in which the Corporation holds a 49 percent ownership interest. The carrying value of the Corporation's investment was $640 million and $2.8 billion at December 31, 2019 and 2018. The joint venture is accounted for as an equity method investment and reported in *All Other*. On July 29, 2019, the Corporation gave notice to the joint venture partner of the termination of the joint venture upon the conclusion of its current term in June 2020. As a result, the Corporation incurred a non-cash, pretax impairment charge in 2019 of $2.1 billion, included in other general operating expense.

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 Corporation 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 payments under these agreements are approximately $8.7 billion and $5.9 billion at December 31, 2019 and 2018. The estimated maturity dates of these obligations extend up to 2049. The Corporation has made no material payments under these guarantees. For more information on maximum potential future payments under VIE-related liquidity commitments, see *Note 7 – Securitizations and Other Variable Interest Entities*.

During 2019, the Corporation recognized a loss of $210 million in other income under its indemnity obligation in connection with the 2017 sale of its non-U.S. consumer credit card business (payment protection insurance).

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.

Guarantees of Certain Long-term Debt

The Corporation, as the parent company, fully and unconditionally guarantees the securities issued by BofA Finance LLC, a 100 percent owned finance subsidiary of the Corporation, and effectively provides for the full and unconditional guarantee of trust securities issued by certain statutory trust companies that are 100 percent owned finance subsidiaries of the Corporation.

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.

The notional amount of unresolved repurchase claims at December 31, 2019 and 2018 was $10.7 billion and $14.4 billion. These balances included $3.7 billion and $6.2 billion at December 31, 2019 and 2018 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 for 2019 also includes $1.6 billion of repurchase claims related to a single monoline insurer and is the subject of litigation.

During 2019, the Corporation received $461 million in new repurchase claims that were not time-barred. During 2019, $4.2 billion in claims were resolved, including $2.1 billion of claims that were deemed time-barred.

Reserve and Related Provision

The reserve for representations and warranties obligations and corporate guarantees was $1.8 billion and $2.0 billion at December 31, 2019 and 2018 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, is based on our experience in previous negotiations, and is subject to judgment, a variety of assumptions, and known or unknown uncertainties. 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 to the Corporation's financial condition and liquidity. See Litigation and Regulatory Matters in this Note below for the Corporation's combined range of possible loss in excess of the reserve for representations and warranties, and the accrued liability for litigation.

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 $681 million and $469 million was recognized in 2019 and 2018.

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 $1.6 billion in excess of the accrued liability, if any.

The estimated range of possible loss, as well as the Corporation's accrued liability, is based upon currently available information and is subject to significant judgment, a variety of assumptions and known and unknown uncertainties. The matters underlying the estimated range of possible loss and liability accrual are unpredictable and will change from time to time, and actual losses may vary significantly from the current estimate and accrual. The estimated range of possible loss does not represent the Corporation's maximum loss exposure.

Information is provided below regarding the nature of the litigation and associated claimed damages. Based on current knowledge, and taking into account accrued liabilities, 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 condition or liquidity of the Corporation. However, in light of the significant judgment, variety of assumptions and 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 business or results of operations for any particular reporting period, or cause significant reputational harm.

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. These actions are at various procedural stages with material developments provided below.

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, 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 the 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 and its Enforcement Section is also conducting a parallel investigation related to the same alleged reporting error. 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 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, named Visa, MasterCard, the Corporation, BANA and other banks as defendants. Plaintiffs alleged antitrust claims and sought compensatory and treble damages as well as injunctive relief.

In 2018, defendants reached a settlement of the putative Rule 23(b)(3) damages class. Defendants agreed to pay an additional amount to participating class members by contribution to the escrow fund established as part of the settlement previously rejected by the U.S. Court of Appeals for the Second Circuit. The Corporation's additional contribution was not material. The District Court granted final approval of the settlement in December 2019. Beginning in January 2020, a number of class members who objected to the settlement appealed to the U.S. Court of Appeals for the Second Circuit.

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 of, 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.

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, Commodity Exchange Act, 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, Commodity Exchange Act 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, Countrywide and certain affiliates are named as defendants in two consolidated putative class action lawsuits filed in the U.S. District Court for the Central District of California (Waldrup and Williams, et al.). Plaintiffs allege that Countrywide and 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 assert a RICO claim and 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.

On January 21, 2020, the parties agreed to resolve the litigation for an amount that is not material to the Corporation, and which was fully accrued as of December 31, 2019. The agreement is subject to court approval.

U.S. Bank - Harborview and SURF/OWNIT Repurchase Litigation

Beginning in 2011, U.S. Bank, National Association (U.S. Bank), as trustee for the HarborView Mortgage Loan Trust 2005-10 and various SURF/OWNIT RMBS trusts filed complaints against the Corporation, Countrywide entities, Merrill Lynch entities and other affiliates in New York Supreme Court alleging breaches of representations and warranties. The defendants and certain certificate-holders in the trusts agreed to settle the respective matters in amounts not material to the Corporation, subject to acceptance by U.S. Bank. The litigations have been stayed pending finalization of the settlements.

NOTE 14 Shareholders' Equity

Common Stock

Declared Quarterly Cash Dividends on Common Stock [1]

Declaration Date	Record Date	Payment Date	Dividend Per Share
January 29, 2020	March 6, 2020	March 27, 2020	$ 0.18
October 22, 2019	December 6, 2019	December 27, 2019	0.18
July 25, 2019	September 6, 2019	September 27, 2019	0.18
April 24, 2019	June 7, 2019	June 28, 2019	0.15
January 30, 2019	March 1, 2019	March 29, 2019	0.15

(1) In 2019, and through February 19, 2020.

The cash dividends paid per share of common stock were $0.66, $0.54 and $0.39 for 2019, 2018 and 2017, respectively.

The following table summarizes common stock repurchases during 2019, 2018 and 2017.

Common Stock Repurchase Summary

(in millions)	2019	2018	2017
Total share repurchases, including CCAR capital plan repurchases	956	676	509
Purchase price of shares repurchased and retired			
CCAR capital plan repurchases	$ 25,644	$16,754	$ 9,347
Other authorized repurchases	2,500	3,340	3,467
Total shares repurchased	$ 28,144	$20,094	$12,814

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 Corporation's Board of Directors (Board) authorized the repurchase of approximately $20.6 billion in common stock from July 1, 2018 through June 30, 2019, which included approximately $600 million in repurchases to offset shares awarded under equity-based compensation plans during the same period. On February 7, 2019, following approval by the Federal Reserve, the Board authorized the repurchase of an additional $2.5 billion of common stock by June 30, 2019.

On June 27, 2019, following the Federal Reserve's non-objection to the Corporation's 2019 CCAR capital plan, the Board authorized the repurchase of approximately $30.9 billion in common stock from July 1, 2019 through June 30, 2020, which includes approximately $900 million in repurchases to offset shares awarded under equity-based compensation plans during the same period.

During 2019, the Corporation repurchased 956 million shares of common stock in connection with the Board's 2018 and 2019 repurchase authorizations, which reduced shareholders' equity by $28.1 billion.

In connection with employee stock plans, in 2019, the Corporation issued 91 million shares of its common stock and, to satisfy tax withholding obligations, repurchased 35 million shares of its common stock. At December 31, 2019, the Corporation had reserved 579 million unissued shares of common stock for future issuances under employee stock plans, convertible notes and preferred stock.

Preferred Stock

The cash dividends declared on preferred stock were $1.4 billion, $1.5 billion and $1.6 billion for 2019, 2018 and 2017, respectively.

On June 20, 2019, the Corporation issued 40,000 shares of 5.125% Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series JJ for $1.0 billion. On June 25, 2019, the Corporation issued 55,900 shares of 5.375% Non-Cumulative Preferred Stock, Series KK for $1.4 billion. On September 17, 2019, the Corporation issued 52,400 shares of 5.000% Non-Cumulative Preferred Stock, Series LL for $1.3 billion. Additionally, on January 24, 2020, the Corporation issued 44,000 shares of 4.300% Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series MM for $1.1 billion.

In 2019, the Corporation fully redeemed Series V and Series W preferred stock for $2.6 billion. Additionally, on January 27, 2020, the Corporation fully redeemed Series Y preferred stock for $1.1 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 below presents a summary of perpetual preferred stock outstanding at December 31, 2019.

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 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	58.75	138	On or after March 15, 2028
Series GG [2]	6.000% Non-Cumulative	May 2018	54,000	25,000	1,350	6.000%	1.50	81	On or after May 16, 2023
Series HH [2]	5.875% Non-Cumulative	July 2018	34,160	25,000	854	5.875%	1.47	50	On or after July 24, 2023
Series JJ [4]	Fixed-to-Floating Rate Non-Cumulative	June 2019	40,000	25,000	1,000	5.125% to, but excluding, 6/20/24; 3-mo. LIBOR + 329.2 bps thereafter	25.63	26	On or after June 20, 2024
Series KK [2]	5.375% Non-Cumulative	June 2019	55,900	25,000	1,398	5.375%	0.67	38	On or after June 25, 2024
Series LL [2]	5.000% Non-Cumulative	September 2019	52,400	25,000	1,310	5.000%	0.31	16	On or after September 17, 2024
Series 1 [5]	Floating Rate Non-Cumulative	November 2004	3,275	30,000	98	3-mo. LIBOR + 75 bps [6]	0.82	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]	0.81	10	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					(357)				
Total			3,887,440		$ 23,401				

(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 15 Accumulated Other Comprehensive Income (Loss)

The table below presents the changes in accumulated OCI after-tax for 2019, 2018 and 2017.

(Dollars in millions)	Debt Securities	Debit Valuation Adjustments	Derivatives	Employee Benefit Plans	Foreign Currency	Total
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	(393)	(220)	(189)	(707)	239	(1,270)
Cumulative adjustment for hedge accounting change	—	—	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)
Net change	**5,875**	**(963)**	**616**	**136**	**(86)**	**5,578**
Balance, December 31, 2019	**$ 323**	**$ (1,494)**	**$ (400)**	**$ (4,168)**	**$ (894)**	**$ (6,633)**

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 2019, 2018 and 2017.

	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax	Pretax	Tax effect	After-tax
(Dollars in millions)		2019			2018			2017	
Debt securities:									
Net increase (decrease) in fair value	**$ 8,020**	**$ (2,000)**	**$ 6,020**	$ (5,189)	$ 1,329	$ (3,860)	$ 240	$ 14	$ 254
Net realized (gains) reclassified into earnings [1]	**(193)**	**48**	**(145)**	(123)	30	(93)	(304)	111	(193)
Net change	**7,827**	**(1,952)**	**5,875**	(5,312)	1,359	(3,953)	(64)	125	61
Debit valuation adjustments:									
Net increase (decrease) in fair value	**(1,276)**	**289**	**(987)**	952	(224)	728	(490)	171	(319)
Net realized losses reclassified into earnings [1]	**18**	**6**	**24**	26	(5)	21	42	(16)	26
Net change	**(1,258)**	**295**	**(963)**	978	(229)	749	(448)	155	(293)
Derivatives:									
Net increase (decrease) in fair value	**692**	**(156)**	**536**	(232)	74	(158)	(50)	1	(49)
Reclassifications into earnings:									
Net interest income	**104**	**(26)**	**78**	165	(40)	125	327	(122)	205
Compensation and benefits expense	**2**	**—**	**2**	(27)	7	(20)	(148)	56	(92)
Net realized losses reclassified into earnings	**106**	**(26)**	**80**	138	(33)	105	179	(66)	113
Net change	**798**	**(182)**	**616**	(94)	41	(53)	129	(65)	64
Employee benefit plans:									
Net increase (decrease) in fair value	**41**	**(21)**	**20**	(703)	164	(539)	223	(55)	168
Net actuarial losses and other reclassified into earnings [2]	**150**	**(36)**	**114**	171	(46)	125	179	(61)	118
Settlements, curtailments and other	**3**	**(1)**	**2**	11	(2)	9	3	(1)	2
Net change	**194**	**(58)**	**136**	(521)	116	(405)	405	(117)	288
Foreign currency:									
Net (decrease) in fair value	**(13)**	**(52)**	**(65)**	(8)	(195)	(203)	(439)	430	(9)
Net realized (gains) losses reclassified into earnings [3]	**(110)**	**89**	**(21)**	(149)	98	(51)	(606)	701	95
Net change	**(123)**	**37**	**(86)**	(157)	(97)	(254)	(1,045)	1,131	86
Total other comprehensive income (loss)	**$ 7,438**	**$ (1,860)**	**$ 5,578**	$ (5,106)	$ 1,190	$ (3,916)	$ (1,023)	$ 1,229	$ 206

[1] Reclassifications of pretax debt securities and DVA 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.
[3] Reclassifications of pretax debt securities, DVA and foreign currency (gains) losses are recorded in other income in the Consolidated Statement of Income.

NOTE 16 Earnings Per Common Share

The calculation of EPS and diluted EPS for 2019, 2018 and 2017 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)	2019	2018	2017
Earnings per common share			
Net income	$ 27,430	$ 28,147	$ 18,232
Preferred stock dividends	(1,432)	(1,451)	(1,614)
Net income applicable to common shareholders	$ 25,998	$ 26,696	$ 16,618
Average common shares issued and outstanding	9,390.5	10,096.5	10,195.6
Earnings per common share	$ 2.77	$ 2.64	$ 1.63
Diluted earnings per common share			
Net income applicable to common shareholders	$ 25,998	$ 26,696	$ 16,618
Add preferred stock dividends due to assumed conversions [1]	—	—	186
Net income allocated to common shareholders	$ 25,998	$ 26,696	$ 16,804
Average common shares issued and outstanding	9,390.5	10,096.5	10,195.6
Dilutive potential common shares [2]	52.4	140.4	582.8
Total diluted average common shares issued and outstanding	9,442.9	10,236.9	10,778.4
Diluted earnings per common share	$ 2.75	$ 2.61	$ 1.56

[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.

For 2019, 2018 and 2017, 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 and 2017, average options to purchase four million and 21 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. For 2017, 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 2019, 2018 and 2017, average warrants to purchase three million, 136 million and 143 million shares of common stock, respectively, were included in the diluted EPS calculation under the treasury stock method. Substantially all of these warrants were exercised on or before their expiration date of January 16, 2019.

NOTE 17 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, 2019 and 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.

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, 2019 and 2018 for the Corporation and BANA.

Regulatory Capital under Basel 3

	Bank of America Corporation			Bank of America, N.A.		
	Standardized Approach	Advanced Approaches	Regulatory Minimum [1]	Standardized Approach	Advanced Approaches	Regulatory Minimum [2]
(Dollars in millions, except as noted)	December 31, 2019					
Risk-based capital metrics:						
Common equity tier 1 capital	**$ 166,760**	**$ 166,760**		**$ 154,626**	**$ 154,626**	
Tier 1 capital	**188,492**	**188,492**		**154,626**	**154,626**	
Total capital [3]	**221,230**	**213,098**		**166,567**	**158,665**	
Risk-weighted assets (in billions)	**1,493**	**1,447**		**1,241**	**991**	
Common equity tier 1 capital ratio	**11.2%**	**11.5%**	**9.5%**	**12.5%**	**15.6%**	**7.0%**
Tier 1 capital ratio	**12.6**	**13.0**	**11.0**	**12.5**	**15.6**	**8.5**
Total capital ratio	**14.8**	**14.7**	**13.0**	**13.4**	**16.0**	**10.5**
Leverage-based metrics:						
Adjusted quarterly average assets (in billions) [4]	**$ 2,374**	**$ 2,374**		**$ 1,780**	**$ 1,780**	
Tier 1 leverage ratio	**7.9%**	**7.9%**	**4.0**	**8.7%**	**8.7%**	**5.0**
SLR leverage exposure (in billions)		**$ 2,946**			**$ 2,177**	
SLR		**6.4%**	**5.0**		**7.1%**	**6.0**
	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 [3]	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) [4]	$ 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

(1) The capital conservation buffer and global systemically important bank surcharge were 2.5 percent at December 31, 2019 and 1.875 percent at December 31, 2018. The countercyclical capital buffer for both periods was zero. The SLR minimum includes a leverage buffer of 2.0 percent.

(2) Risk-based capital regulatory minimums at December 31, 2019 are the minimum ratios under Basel 3 including a capital conservation buffer of 2.5 percent. The regulatory minimums for the leverage ratios as of both period ends and risk-based capital ratios as of December 31, 2018 are the percent required to be considered well capitalized under the PCA framework.

(3) 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.

(4) Reflects total average assets adjusted for certain Tier 1 capital deductions.

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, 2019 and 2018, 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 $14.6 billion and $11.4 billion for 2019 and 2018. At December 31, 2019 and 2018, the Corporation had cash and cash equivalents in the amount of $6.3 billion and $5.8 billion, and securities with a fair value of $14.7 billion and $16.6 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 more information, see *Note 11 – Federal Funds Sold or Purchased, Securities Financing Agreements, Short-term Borrowings and Restricted Cash*. In addition, at December 31, 2019 and 2018, the Corporation had cash deposited with clearing organizations of $7.6 billion and $8.1 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 2019, the Corporation received dividends of $20.5 billion from BANA and $215 million from Bank of America California, N.A. In addition, BANA returned capital of $8.0 billion to the Corporation in 2019.

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 2020, BANA can declare and pay dividends of approximately $9.4 billion to the Corporation plus an additional amount equal to its retained net profits for 2020 up to the date of any such dividend declaration. Bank of America California, N.A. can pay dividends of $94 million in 2020 plus an additional amount equal to its retained net profits for 2020 up to the date of any such dividend declaration.

NOTE 18 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 2019 or 2018. 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.

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, 2019 and 2018. 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 decreases in the weighted-average discount rates in 2019 resulted in increases to the PBO of approximately $2.2 billion at December 31, 2019. 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. Significant gains and losses related to changes in the PBO for 2019 and 2018 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)	2019	2018	2019	2018	2019	2018	2019	2018
Fair value, January 1	**$ 18,178**	$ 19,708	**$ 2,461**	$ 2,943	**$ 2,584**	$ 2,724	**$ 252**	$ 300
Actual return on plan assets	**3,187**	(550)	**273**	(181)	**228**	8	**5**	5
Company contributions	**—**	—	**20**	22	**91**	91	**24**	43
Plan participant contributions	**—**	—	**1**	1	**—**	—	**103**	115
Settlements and curtailments	**—**	—	**(42)**	(107)	**—**	—	**—**	—
Benefits paid	**(1,090)**	(980)	**(108)**	(52)	**(237)**	(239)	**(185)**	(214)
Federal subsidy on benefits paid	**n/a**	n/a	**n/a**	n/a	**n/a**	n/a	**—**	3
Foreign currency exchange rate changes	**n/a**	n/a	**91**	(165)	**n/a**	n/a	**n/a**	n/a
Fair value, December 31	**$ 20,275**	$ 18,178	**$ 2,696**	$ 2,461	**$ 2,666**	$ 2,584	**$ 199**	$ 252
Change in projected benefit obligation								
Projected benefit obligation, January 1	**$ 14,144**	$ 15,706	**$ 2,589**	$ 2,814	**$ 2,779**	$ 3,047	**$ 928**	$ 1,056
Service cost	**—**	—	**17**	19	**1**	1	**5**	6
Interest cost	**593**	563	**65**	65	**113**	105	**38**	36
Plan participant contributions	**—**	—	**1**	1	**—**	—	**103**	115
Plan amendments	**—**	—	**2**	13	**—**	—	**—**	—
Settlements and curtailments	**—**	—	**(42)**	(107)	**—**	—	**—**	—
Actuarial loss (gain)	**1,714**	(1,145)	**288**	(29)	**263**	(135)	**99**	(73)
Benefits paid	**(1,090)**	(980)	**(108)**	(52)	**(237)**	(239)	**(185)**	(214)
Federal subsidy on benefits paid	**n/a**	n/a	**n/a**	n/a	**n/a**	n/a	**—**	3
Foreign currency exchange rate changes	**n/a**	n/a	**75**	(135)	**n/a**	n/a	**1**	(1)
Projected benefit obligation, December 31	**$ 15,361**	$ 14,144	**$ 2,887**	$ 2,589	**$ 2,919**	$ 2,779	**$ 989**	$ 928
Amounts recognized on Consolidated Balance Sheet								
Other assets	**$ 4,914**	$ 4,034	**$ 364**	$ 316	**$ 733**	$ 754	**$ —**	$ —
Accrued expenses and other liabilities	**—**	—	**(555)**	(444)	**(986)**	(949)	**(790)**	(676)
Net amount recognized, December 31	**$ 4,914**	$ 4,034	**$ (191)**	$ (128)	**$ (253)**	$ (195)	**$ (790)**	$ (676)
Funded status, December 31								
Accumulated benefit obligation	**$ 15,361**	$ 14,144	**$ 2,841**	$ 2,542	**$ 2,919**	$ 2,778	**n/a**	n/a
Overfunded (unfunded) status of ABO	**4,914**	4,034	**(145)**	(81)	**(253)**	(194)	**n/a**	n/a
Provision for future salaries	**—**	—	**46**	47	**—**	1	**n/a**	n/a
Projected benefit obligation	**15,361**	14,144	**2,887**	2,589	**2,919**	2,779	**$ 989**	$ 928
Weighted-average assumptions, December 31								
Discount rate	**3.32%**	4.32%	**1.81%**	2.60%	**3.20%**	4.26%	**3.27%**	4.25%
Rate of compensation increase	**n/a**	n/a	**4.10**	4.49	**4.00**	4.00	**n/a**	n/a
Interest-crediting rate	**5.06**	5.18	**1.53**	1.47	**4.52**	4.50	**n/a**	n/a

(1) The measurement date for all of the above 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 2020 is $21 million, $92 million and $15 million, respectively. The Corporation does not expect to make a contribution to the Qualified Pension Plan in 2020. 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, 2019 and 2018 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 2019	Non-U.S. Pension Plans 2018	Nonqualified and Other Pension Plans 2019	Nonqualified and Other Pension Plans 2018
PBO	**$ 744**	$ 615	**$ 988**	$ 950
ABO	**720**	605	**988**	949
Fair value of plan assets	**191**	173	**1**	1

Components of Net Periodic Benefit Cost

(Dollars in millions)	Qualified Pension Plan 2019	Qualified Pension Plan 2018	Qualified Pension Plan 2017	Non-U.S. Pension Plans 2019	Non-U.S. Pension Plans 2018	Non-U.S. Pension Plans 2017
Components of net periodic benefit cost (income)						
Service cost	**$ —**	$ —	$ —	**$ 17**	$ 19	$ 24
Interest cost	**593**	563	606	**65**	65	72
Expected return on plan assets	**(1,088)**	(1,136)	(1,068)	**(99)**	(126)	(136)
Amortization of net actuarial loss	**135**	147	154	**6**	10	8
Other	**—**	—	—	**4**	12	(7)
Net periodic benefit cost (income)	**$ (360)**	$ (426)	$ (308)	**$ (7)**	$ (20)	$ (39)
Weighted-average assumptions used to determine net cost for years ended December 31						
Discount rate	**4.32%**	3.68%	4.16%	**2.60%**	2.39%	2.56%
Expected return on plan assets	**6.00**	6.00	6.00	**4.13**	4.37	4.73
Rate of compensation increase	**n/a**	n/a	n/a	**4.49**	4.31	4.51

(Dollars in millions)	Nonqualified and Other Pension Plans 2019	Nonqualified and Other Pension Plans 2018	Nonqualified and Other Pension Plans 2017	Postretirement Health and Life Plans 2019	Postretirement Health and Life Plans 2018	Postretirement Health and Life Plans 2017
Components of net periodic benefit cost (income)						
Service cost	**$ 1**	$ 1	$ 1	**$ 5**	$ 6	$ 6
Interest cost	**113**	105	117	**38**	36	43
Expected return on plan assets	**(95)**	(84)	(95)	**(5)**	(6)	—
Amortization of net actuarial loss (gain)	**34**	43	34	**(24)**	(27)	(21)
Other	**—**	—	—	**(2)**	(3)	4
Net periodic benefit cost (income)	**$ 53**	$ 65	$ 57	**$ 12**	$ 6	$ 32
Weighted-average assumptions used to determine net cost for years ended December 31						
Discount rate	**4.26%**	3.58%	4.01%	**4.25%**	3.58%	3.99%
Expected return on plan assets	**3.73**	3.19	3.50	**2.00**	2.00	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 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 2020, reducing in steps to 5.00 percent in 2026 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 had a significant impact on the net periodic benefit cost for 2019.

Pretax Amounts included in Accumulated OCI and OCI

(Dollars in millions)	Qualified Pension Plan 2019	Qualified Pension Plan 2018	Non-U.S. Pension Plans 2019	Non-U.S. Pension Plans 2018	Nonqualified and Other Pension Plans 2019	Nonqualified and Other Pension Plans 2018	Postretirement Health and Life Plans 2019	Postretirement Health and Life Plans 2018	Total 2019	Total 2018
Net actuarial loss (gain)	**$ 3,865**	$ 4,386	**$ 559**	$ 454	**$ 1,008**	$ 912	**$ 48**	$ (75)	**$ 5,480**	$ 5,677
Prior service cost (credits)	**—**	—	**18**	18	**—**	—	**(6)**	(9)	**12**	9
Amounts recognized in accumulated OCI	**$ 3,865**	$ 4,386	**$ 577**	$ 472	**$ 1,008**	$ 912	**$ 42**	$ (84)	**$ 5,492**	$ 5,686
Current year actuarial loss (gain)	**$ (385)**	$ 541	**$ 110**	$ 270	**$ 130**	$ (59)	**$ 99**	$ (73)	**$ (46)**	$ 679
Amortization of actuarial gain (loss) and prior service cost	**(135)**	(147)	**(7)**	(11)	**(34)**	(43)	**26**	30	**(150)**	(171)
Current year prior service cost (credit)	**—**	—	**2**	13	**—**	—	**—**	—	**2**	13
Amounts recognized in OCI	**$ (520)**	$ 394	**$ 105**	$ 272	**$ 96**	$ (102)	**$ 125**	$ (43)	**$ (194)**	$ 521

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 plans' 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 2020 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 $315 million (1.55 percent of total plan assets) and $221 million (1.22 percent of total plan assets) at December 31, 2019 and 2018.

2020 Target Allocation

	Percentage		
Asset Category	**Qualified Pension Plan**	**Non-U.S. Pension Plans**	**Nonqualified and Other Pension Plans**
Equity securities	15 - 50%	5 - 30%	0 - 5%
Debt securities	45 - 80%	40 - 70%	95 - 100%
Real estate	0 - 10%	0 - 15%	0 - 5%
Other	0 - 5%	10 - 40%	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 21 – Fair Value Measurements*. Combined plan investment assets measured at fair value by level and in total at December 31, 2019 and 2018 are summarized in the Fair Value Measurements table.

Fair Value Measurements

(Dollars in millions)	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
	December 31, 2019				December 31, 2018			
Cash and short-term investments								
Money market and interest-bearing cash	$ 1,426	$ —	$ —	$ 1,426	$ 1,530	$ —	$ —	$ 1,530
Cash and cash equivalent commingled/mutual funds	—	250	—	250	—	644	—	644
Fixed income								
U.S. government and agency securities	4,403	890	8	5,301	3,637	805	9	4,451
Corporate debt securities	—	3,676	—	3,676	—	2,852	—	2,852
Asset-backed securities	—	2,684	—	2,684	—	2,119	—	2,119
Non-U.S. debt securities	748	1,015	—	1,763	539	961	—	1,500
Fixed income commingled/mutual funds	804	1,439	—	2,243	933	1,177	—	2,110
Equity								
Common and preferred equity securities	4,655	—	—	4,655	4,414	—	—	4,414
Equity commingled/mutual funds	147	1,355	—	1,502	288	1,275	—	1,563
Public real estate investment trusts	91	—	—	91	104	—	—	104
Real estate								
Private real estate	—	—	—	—	—	—	5	5
Real estate commingled/mutual funds	—	18	927	945	—	13	885	898
Limited partnerships	—	173	90	263	—	158	82	240
Other investments [1]	11	390	636	1,037	93	364	588	1,045
Total plan investment assets, at fair value	$ 12,285	$ 11,890	$ 1,661	$ 25,836	$ 11,538	$ 10,368	$ 1,569	$ 23,475

[1] Other investments include commodity and balanced funds of $233 million and $305 million, insurance annuity contracts of $614 million and $562 million and other various investments of $190 million and $178 million at December 31, 2019 and 2018.

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 2019, 2018 and 2017.

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
	2019			
Fixed income				
U.S. government and agency securities	$ 9	$ —	$ (1)	$ 8
Real estate				
Private real estate	5	—	(5)	—
Real estate commingled/mutual funds	885	33	9	927
Limited partnerships	82	—	8	90
Other investments	588	6	42	636
Total	$ 1,569	$ 39	$ 53	$ 1,661
	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

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)
2020	$ 917	$ 108	$ 242	$ 83
2021	926	107	245	80
2022	927	110	232	77
2023	917	116	230	74
2024	924	126	223	72
2025 - 2029	4,409	594	1,011	313

(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 2019, 2018 and 2017 related to the qualified defined contribution plans. At December 31, 2019 and 2018, 189 million and 212 million shares of the Corporation's common stock were held by these plans. Payments to the plans for dividends on common stock were $133 million, $115 million and $86 million in 2019, 2018 and 2017, respectively.

Certain non-U.S. employees are covered under defined contribution pension plans that are separately administered in accordance with local laws.

NOTE 19 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). On April 24, 2019, Bank of America's shareholders approved an amendment to the KEEP to increase the number of shares available for grant by 150 million. Subsequent to this amendment, 600 million shares of the Corporation's common stock are authorized to be used for grants of awards.

During 2019 and 2018, the Corporation granted 94 million and 71 million RSU awards to certain employees under the KEEP. These 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 2019 and 2018, 71 million and 63 million will vest predominantly over three years with most vesting occurring 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. For RSUs granted to employees who are retirement eligible, the awards are deemed authorized as of the beginning of the year preceding the grant date when the incentive award plans are generally approved. As a result, the estimated value is expensed ratably over the year preceding the grant date. Additionally, 23 million and eight million of the RSUs granted in 2019 and 2018 will vest predominantly over four years with most vesting occurring 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.

The compensation cost for the stock-based plans was $2.1 billion, $1.8 billion and $2.2 billion and the related income tax benefit was $511 million, $433 million and $829 million for 2019, 2018 and 2017, respectively.

Restricted Stock/Units

The table below presents the status at December 31, 2019 of the share-settled restricted stock/units and changes during 2019.

Stock-settled Restricted Stock/Units

	Shares/Units	Weighted-average Grant Date Fair Value
Outstanding at January 1, 2019	165,621,246	$ 23.22
Granted	91,164,482	27.72
Vested	(92,215,549)	19.30
Canceled	(6,660,864)	27.49
Outstanding at December 31, 2019	**157,909,315**	**27.93**

The table below presents the status at December 31, 2019 of the cash-settled RSUs and changes during 2019.

Cash-settled Restricted Units

	Units
Outstanding at January 1, 2019	2,609,122
Granted	2,455,177
Vested	(3,006,707)
Canceled	(93,170)
Outstanding at December 31, 2019	**1,964,422**

At December 31, 2019, there was an estimated $1.6 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 2.2 years. The total fair value of restricted stock vested in 2019, 2018 and 2017 was $2.6 billion, $2.3 billion and $1.3 billion, respectively. In 2019, 2018 and 2017, the amount of cash paid to settle equity-based awards for all equity compensation plans was $84 million, $1.3 billion and $1.9 billion, respectively.

NOTE 20 Income Taxes

The components of income tax expense for 2019, 2018 and 2017 are presented in the table below.

Income Tax Expense

(Dollars in millions)	2019	2018	2017
Current income tax expense			
U.S. federal	**$ 1,136**	$ 816	$ 1,310
U.S. state and local	**901**	1,377	557
Non-U.S.	**852**	1,203	939
Total current expense	**2,889**	3,396	2,806
Deferred income tax expense			
U.S. federal	**2,001**	2,579	7,238
U.S. state and local	**223**	240	835
Non-U.S.	**211**	222	102
Total deferred expense	**2,435**	3,041	8,175
Total income tax expense	**$ 5,324**	$ 6,437	$ 10,981

Total income tax expense does not reflect the tax effects of items that are included in OCI each period. For more information, see *Note 15 – Accumulated Other Comprehensive Income (Loss)*. Other tax effects included in OCI each period resulted in an expense of $1.9 billion in 2019 and a benefit of $1.2 billion in both 2018 and 2017.

Income tax expense for 2019, 2018 and 2017 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 2019 and 2018, and 35 percent for 2017. 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 2019, 2018 and 2017 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.

Reconciliation of Income Tax Expense

	2019		2018		2017	
(Dollars in millions)	**Amount**	**Percent**	Amount	Percent	Amount	Percent
Expected U.S. federal income tax expense	**$ 6,878**	**21.0%**	$ 7,263	21.0%	$ 10,225	35.0%
Increase (decrease) in taxes resulting from:						
State tax expense, net of federal benefit	**1,283**	**3.9**	1,367	4.0	881	3.0
Affordable housing/energy/other credits	**(2,365)**	**(7.2)**	(1,888)	(5.5)	(1,406)	(4.8)
Changes in prior-period UTBs, including interest	**(613)**	**(1.9)**	144	0.4	133	0.5
Tax-exempt income, including dividends	**(433)**	**(1.3)**	(413)	(1.2)	(672)	(2.3)
Stock-based compensation	**(225)**	**(0.7)**	(257)	(0.7)	(236)	(0.8)
Rate differential on non-U.S. earnings	**504**	**1.5**	98	0.3	(272)	(0.9)
Nondeductible expenses	**290**	**0.9**	302	0.9	97	0.3
Tax law changes	**—**	**—**	—	—	2,281	7.8
Other	**5**	**0.1**	(179)	(0.6)	(50)	(0.2)
Total income tax expense	**$ 5,324**	**16.3%**	$ 6,437	18.6%	$ 10,981	37.6%

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)	2019	2018	2017
Balance, January 1	**$ 2,197**	$ 1,773	$ 875
Increases related to positions taken during the current year	**238**	395	292
Increases related to positions taken during prior years [(1)]	**401**	406	750
Decreases related to positions taken during prior years [(1)]	**(1,102)**	(371)	(122)
Settlements	**(541)**	(6)	(17)
Expiration of statute of limitations	**(18)**	—	(5)
Balance, December 31	**$ 1,175**	$ 2,197	$ 1,773

(1) The sum of the positions taken during prior years differs from the $(613) million, $144 million and $133 million in the Reconciliation of Income Tax Expense table due to temporary items, state items and jurisdictional offsets, as well as the inclusion of interest in the Reconciliation of Income Tax Expense table.

At December 31, 2019, 2018 and 2017, the balance of the Corporation's UTBs which would, if recognized, affect the Corporation's effective tax rate was $814 million, $1.6 billion and $1.2 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.

It is reasonably possible that the UTB balance may decrease by as much as $64 million 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 an interest benefit of $19 million in 2019 and interest expense of $43 million and $1 million in 2018 and 2017. At December 31, 2019 and 2018, the Corporation's accrual for interest and penalties that related to income taxes, net of taxes and remittances, was $147 million and $218 million.

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, 2019.

Tax Examination Status

	Years under Examination (1)	Status at December 31 2019
United States	2017-2018	To begin in 2020
California	2012-2017	Field examination
New York	2016-2018	Field examination
United Kingdom	2018	Field examination

(1) All tax years subsequent to the years shown remain subject to examination.

Significant components of the Corporation's net deferred tax assets and liabilities at December 31, 2019 and 2018 are presented in the following table.

Deferred Tax Assets and Liabilities

	December 31	
(Dollars in millions)	2019	2018
Deferred tax assets		
Net operating loss carryforwards	$ **7,417**	$ 7,993
Allowance for credit losses	**2,354**	2,400
Lease liability	**2,321**	—
Security, loan and debt valuations	**1,860**	1,818
Accrued expenses	**1,719**	1,875
Employee compensation and retirement benefits	**1,622**	1,564
Credit carryforwards	**183**	623
Available-for-sale securities	**—**	1,854
Other	**1,203**	1,037
Gross deferred tax assets	**18,679**	19,164
Valuation allowance	**(1,989)**	(1,569)
Total deferred tax assets, net of valuation allowance	**16,690**	17,595
Deferred tax liabilities		
Equipment lease financing	**2,933**	2,684
Right-to-use asset	**2,246**	—
Tax credit investments	**1,577**	940
Fixed assets	**1,505**	1,104
Available-for-sale securities	**100**	—
Other	**1,885**	2,126
Gross deferred tax liabilities	**10,246**	6,854
Net deferred tax assets	$ **6,444**	$ 10,741

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, 2019.

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.	$ 312	$ —	$ **312**	After 2028
Net operating losses - U.K. (1)	5,276	—	**5,276**	None
Net operating losses - other non-U.S.	493	(423)	**70**	Various
Net operating losses - U.S. states (2)	1,336	(580)	**756**	Various
Foreign tax credits	183	(183)	**—**	2028

(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 $1.7 billion and $734 million.

Management concluded that no valuation allowance was necessary to reduce the deferred tax assets related to the U.K. NOL carryforwards and U.S. federal and certain state NOL 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, 2019, U.S. federal income taxes had not been provided on approximately $5.0 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 $1.0 billion.

NOTE 21 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 and conducts a review of 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 become 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 more information, see *Note 22 – 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 2019, there were no significant 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, and 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 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, interest rates, 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, 2019 and 2018, including financial instruments that the Corporation accounts for under the fair value option, are summarized in the following tables.

	December 31, 2019				
	Fair Value Measurements				
(Dollars in millions)	Level 1	Level 2	Level 3	Netting Adjustments (1)	Assets/Liabilities at Fair Value
Assets					
Time deposits placed and other short-term investments	$ 1,000	$ —	$ —	$ —	$ 1,000
Federal funds sold and securities borrowed or purchased under agreements to resell	—	50,364	—	—	50,364
Trading account assets:					
U.S. Treasury and agency securities (2)	49,517	4,157	—	—	53,674
Corporate securities, trading loans and other	—	25,226	1,507	—	26,733
Equity securities	53,597	32,619	239	—	86,455
Non-U.S. sovereign debt	3,965	23,854	482	—	28,301
Mortgage trading loans, MBS and ABS:					
U.S. government-sponsored agency guaranteed (2)	—	24,324	—	—	24,324
Mortgage trading loans, ABS and other MBS	—	8,786	1,553	—	10,339
Total trading account assets (3)	107,079	118,966	3,781	—	229,826
Derivative assets	14,079	328,442	2,226	(304,262)	40,485
AFS debt securities:					
U.S. Treasury and agency securities	67,332	1,196	—	—	68,528
Mortgage-backed securities:					
Agency	—	122,528	—	—	122,528
Agency-collateralized mortgage obligations	—	4,641	—	—	4,641
Non-agency residential	—	653	424	—	1,077
Commercial	—	15,021	—	—	15,021
Non-U.S. securities	—	11,989	2	—	11,991
Other taxable securities	—	3,876	65	—	3,941
Tax-exempt securities	—	17,804	108	—	17,912
Total AFS debt securities	67,332	177,708	599	—	245,639
Other debt securities carried at fair value:					
U.S. Treasury and agency securities	3	—	—	—	3
Agency MBS	—	3,003	—	—	3,003
Non-agency residential MBS	—	1,035	299	—	1,334
Non-U.S. and other securities	400	6,088	—	—	6,488
Total other debt securities carried at fair value	403	10,126	299	—	10,828
Loans and leases	—	7,642	693	—	8,335
Loans held-for-sale	—	3,334	375	—	3,709
Other assets (4)	11,782	1,376	2,360	—	15,518
Total assets (5)	$ 201,675	$ 697,958	$ 10,333	$ (304,262)	$ 605,704
Liabilities					
Interest-bearing deposits in U.S. offices	$ —	$ 508	$ —	$ —	$ 508
Federal funds purchased and securities loaned or sold under agreements to repurchase	—	16,008	—	—	16,008
Trading account liabilities:					
U.S. Treasury and agency securities	13,140	282	—	—	13,422
Equity securities	38,148	4,144	2	—	42,294
Non-U.S. sovereign debt	10,751	11,310	—	—	22,061
Corporate securities and other	—	5,478	15	—	5,493
Total trading account liabilities	62,039	21,214	17	—	83,270
Derivative liabilities	11,904	320,479	4,764	(298,918)	38,229
Short-term borrowings	—	3,941	—	—	3,941
Accrued expenses and other liabilities	13,927	1,507	—	—	15,434
Long-term debt	—	33,826	1,149	—	34,975
Total liabilities (5)	$ 87,870	$ 397,483	$ 5,930	$ (298,918)	$ 192,365

(1) Amounts represent the impact of legally enforceable master netting agreements and also cash collateral held or placed with the same counterparties.
(2) Includes $26.7 billion of GSE obligations.
(3) Includes securities with a fair value of $14.7 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 $1.5 billion which are classified as Level 3 assets.
(5) Total recurring Level 3 assets were 0.42 percent of total consolidated assets, and total recurring Level 3 liabilities were 0.27 percent of total consolidated liabilities.

(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 [2]	—	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
Non-agency residential MBS	—	1,434	172	—	1,606
Non-U.S. and other securities	490	5,357	—	—	5,847
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	—	26,872	817	—	27,689
Total liabilities [5]	$ 77,112	$ 382,424	$ 5,236	$ (279,882)	$ 184,890

(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.

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 2019, 2018 and 2017, including net realized and unrealized gains (losses) included in earnings and accumulated OCI. Transfers into Level 3 occur primarily due to decreased price observability, and transfers out of Level 3 occur primarily due to increased price observability. 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.

Level 3 – Fair Value Measurements [1]

(Dollars in millions)	Balance January 1	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	Change in Unrealized Gains (Losses) in Net Income Related to Financial Instruments Still Held [2]
				Purchases	Sales	Issuances	Settlements				
Year Ended December 31, 2019											
Trading account assets:											
Corporate securities, trading loans and other	$ 1,558	$ 105	$ —	$ 534	$ (390)	$ 18	$ (578)	$ 699	$ (439)	$ 1,507	$ 29
Equity securities	276	(12)	—	38	(87)	—	(9)	79	(46)	239	(18)
Non-U.S. sovereign debt	465	46	(12)	1	—	—	(51)	39	(6)	482	47
Mortgage trading loans, ABS and other MBS	1,635	99	(2)	662	(899)	—	(175)	738	(505)	1,553	26
Total trading account assets	3,934	238	(14)	1,235	(1,376)	18	(813)	1,555	(996)	3,781	84
Net derivative assets (liabilities) [4,5]	(935)	(37)	—	298	(837)	—	(97)	147	(1,077)	(2,538)	228
AFS debt securities:											
Non-agency residential MBS	597	13	64	—	(73)	—	(40)	206	(343)	424	—
Non-U.S. securities	2	—	—	—	—	—	—	—	—	2	—
Other taxable securities	7	2	—	—	—	—	(5)	61	—	65	—
Tax-exempt securities	—	—	—	—	—	—	—	108	—	108	—
Total AFS debt securities	606	15	64	—	(73)	—	(45)	375	(343)	599	—
Other debt securities carried at fair value – Non-agency residential MBS	172	36	—	—	—	—	(17)	155	(47)	299	38
Loans and leases [6,7]	338	—	—	230	(35)	217	(57)	—	—	693	(1)
Loans held-for-sale [6,7]	542	48	(6)	12	(71)	36	(245)	59	—	375	22
Other assets [7]	2,932	(81)	19	—	(10)	179	(683)	5	(1)	2,360	(267)
Trading account liabilities – Equity securities	—	(2)	—	—	—	—	—	—	—	(2)	(2)
Trading account liabilities – Corporate securities and other	(18)	8	—	(1)	(3)	(1)	—	—	—	(15)	—
Long-term debt [5,6]	(817)	(59)	(64)	—	—	(40)	180	(350)	1	(1,149)	(55)
Year Ended December 31, 2018											
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 (liabilities) [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 [8]	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 [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 market making and similar activities; Net derivative assets (liabilities) - market making and similar activities and other income; Other debt securities carried at fair value - other income; Loans and leases - predominantly other income; Loans held-for-sale - other income; Other assets - primarily other income related to MSRs; Long-term debt - primarily market making and similar activities.

(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. Amounts include net unrealized gains (losses) of $3 million and $(105) million related to financial instruments still held at December 31, 2019 and 2018.

(4) Net derivative assets (liabilities) include derivative assets of $2.2 billion and $3.5 billion and derivative liabilities of $4.8 billion and $4.4 billion at December 31, 2019 and 2018.

(5) Transfers into long-term debt include a $1.4 billion transfer in of Level 3 derivative assets to reflect the Corporation's change to present bifurcated embedded derivatives with their respective host instruments.

(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) Transfers out of AFS debt securities and into other assets primarily relate to the reclassification of certain securities.

Level 3 – Fair Value Measurements [1]

(Dollars in millions)	Balance January 1	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	Change in Unrealized Gains/ (Losses) in Net Income Related to Financial Instruments Still Held [2]
Year Ended December 31, 2017											
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 (liabilities) [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]	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 - market making and similar activities; Net derivative assets (liabilities) - primarily market making and similar activities 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 market making and similar activities.
(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.
(4) Net derivative assets (liabilities) 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.

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, 2019 and 2018.

Quantitative Information about Level 3 Fair Value Measurements at December 31, 2019

(Dollars in millions)

			Inputs		
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	**$ 1,407**	Discounted cash flow, Market comparables	Yield	0% to 25%	6%
Trading account assets – Mortgage trading loans, ABS and other MBS	332		Prepayment speed	1% to 27% CPR	17% CPR
Loans and leases	281		Default rate	0% to 3% CDR	1% CDR
Loans held-for-sale	4		Loss severity	0% to 47%	14%
AFS debt securities, primarily non-agency residential	491		Price	$0 to $160	$94
Other debt securities carried at fair value - Non-agency residential	299				
Instruments backed by commercial real estate assets	**$ 303**	Discounted cash flow	Yield	0% to 30%	14%
Trading account assets – Corporate securities, trading loans and other	201		Price	$0 to $100	$55
Trading account assets – Mortgage trading loans, ABS and other MBS	85				
Loans held-for-sale	17				
Commercial loans, debt securities and other	**$ 3,798**	Discounted cash flow, Market comparables	Yield	1% to 20%	6%
Trading account assets – Corporate securities, trading loans and other	1,306		Prepayment speed	10% to 20%	13%
Trading account assets – Non-U.S. sovereign debt	482		Default rate	3% to 4%	4%
Trading account assets – Mortgage trading loans, ABS and other MBS	1,136		Loss severity	35% to 40%	38%
AFS debt securities – Other taxable securities	108		Price	$0 to $142	$72
Loans and leases	412		Long-dated equity volatilities	35%	n/a
Loans held-for-sale	354				
Other assets, primarily auction rate securities	**$ 815**	Discounted cash flow, Market comparables	Price	$10 to $100	$96
MSRs	**$ 1,545**	Discounted cash flow	Weighted-average life, fixed rate [5]	0 to 14 years	5 years
			Weighted-average life, variable rate [5]	0 to 9 years	3 years
			Option-adjusted spread, fixed rate	7% to 14%	9%
			Option-adjusted spread, variable rate	9% to 15%	11%
Structured liabilities					
Long-term debt	**$ (1,149)**	Discounted cash flow, Market comparables, Industry standard derivative pricing [3]	Yield	2% to 6%	5%
			Equity correlation	9% to 100%	63%
			Long-dated equity volatilities	4% to 101%	32%
			Price	$0 to $116	$74
			Natural gas forward price	$1/MMBtu to $5/MMBtu	$3/MMBtu
Net derivative assets (liabilities)					
Credit derivatives	**$ 13**	Discounted cash flow, Stochastic recovery correlation model	Yield	5%	n/a
			Upfront points	0 to 100 points	63 points
			Prepayment speed	15% to 100% CPR	22% CPR
			Default rate	1% to 4% CDR	2% CDR
			Loss severity	35%	n/a
			Price	$0 to $104	$73
Equity derivatives	**$ (1,081)**	Industry standard derivative pricing [3]	Equity correlation	9% to 100%	63%
			Long-dated equity volatilities	4% to 101%	32%
Commodity derivatives	**$ (1,357)**	Discounted cash flow, Industry standard derivative pricing [3]	Natural gas forward price	$1/MMBtu to $5/MMBtu	$3/MMBtu
			Correlation	30% to 69%	68%
			Volatilities	14% to 54%	27%
Interest rate derivatives	**$ (113)**	Industry standard derivative pricing [4]	Correlation (IR/IR)	15% to 94%	52%
			Correlation (FX/IR)	0% to 46%	2%
			Long-dated inflation rates	-23% to 56%	16%
			Long-dated inflation volatilities	0% to 1%	1%
Total net derivative assets (liabilities)	**$ (2,538)**				

(1) For loans and securities, structured liabilities and net derivative assets (liabilities), 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 $1.5 billion, Trading account assets – Non-U.S. sovereign debt of $482 million, Trading account assets – Mortgage trading loans, ABS and other MBS of $1.6 billion, AFS debt securities of $599 million, Other debt securities carried at fair value - Non-agency residential of $299 million, Other assets, including MSRs, of $2.4 billion, Loans and leases of $693 million and LHFS of $375 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, 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% CPR
Loans and leases	338		Default rate	0% to 3% CDR	1% CDR
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 (liabilities)					
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% CPR
			Default rate	1% to 4% CDR	2% CDR
			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 (liabilities)	$ (935)				

[1] For loans and securities, structured liabilities and net derivative assets (liabilities), 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 169: 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

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 result 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.

Nonrecurring Fair Value

The Corporation holds certain assets that are measured at fair value only in certain situations (e.g., the impairment of an asset), 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 2019, 2018 and 2017. In the tables below, other assets includes the measurement of the Corporation's merchant services equity method investment on which the Corporation recorded an impairment charge of $2.1 billion during 2019. For more information, see *Note 13 – Commitments and Contingencies*.

Assets Measured at Fair Value on a Nonrecurring Basis

	December 31, 2019		December 31, 2018	
(Dollars in millions)	**Level 2**	**Level 3**	Level 2	Level 3
Assets				
Loans held-for-sale	**$ 53**	**$ 102**	$ 274	$ —
Loans and leases [(1)]	**—**	**257**	—	474
Foreclosed properties [(2, 3)]	**—**	**17**	—	42
Other assets	**178**	**646**	331	14

	Gains (Losses)		
	2019	2018	2017
Assets			
Loans held-for-sale	**$ (14)**	$ (18)	$ (6)
Loans and leases [(1)]	**(81)**	(202)	(336)
Foreclosed properties	**(9)**	(24)	(41)
Other assets	**(2,145)**	(64)	(124)

(1) Includes $36 million, $83 million and $135 million of losses on loans that were written down to a collateral value of zero during 2019, 2018 and 2017, 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 $260 million and $488 million of properties acquired upon foreclosure of certain government-guaranteed loans (principally FHA-insured loans) at December 31, 2019 and 2018.

The table below presents information about significant unobservable inputs at December 31, 2019 and 2018.

Quantitative Information about Nonrecurring Level 3 Fair Value Measurements

			Inputs		
Financial Instrument	Fair Value	Valuation Technique	Significant Unobservable Inputs	Ranges of Inputs	Weighted Average [(1)]
(Dollars in millions)			**December 31, 2019**		
Loans held-for-sale	$ **102**	Discounted cash flow	Price	$85 to $97	$88
Loans and leases [(2)]	**257**	Market comparables	OREO discount	13% to 59%	24%
			Costs to sell	8% to 26%	9%
Other assets [(3)]	**640**	Discounted cash flow	Customer attrition	0% to 19%	5%
			Costs to service	11% to 19%	15%
			December 31, 2018		
Loans and leases [(2)]	$ 474	Market comparables	OREO discount	13% to 59%	25%
			Costs to sell	8% to 26%	9%

(1) The weighted average is calculated based upon the fair value of the loans.
(2) Represents residential mortgages where the loan has been written down to the fair value of the underlying collateral.
(3) The fair value of the merchant services joint venture was measured using a discounted cash flow method in which the two primary drivers of fair value were the customer attrition rate and certain costs to service the customers. The weighted averages are calculated based on variations of the attrition rates and costs to service the customers.

NOTE 22 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. 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. 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. 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 following tables provide 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, 2019 and 2018, and 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 2019, 2018 and 2017.

Fair Value Option Elections

	December 31, 2019			December 31, 2018		
(Dollars in millions)	**Fair Value Carrying Amount**	**Contractual Principal Outstanding**	**Fair Value Carrying Amount Less Unpaid Principal**	Fair Value Carrying Amount	Contractual Principal Outstanding	Fair Value Carrying Amount Less Unpaid Principal
Federal funds sold and securities borrowed or purchased under agreements to resell	**$ 50,364**	**$ 50,318**	**$ 46**	$ 56,399	$ 56,376	$ 23
Loans reported as trading account assets [1]	**6,989**	**14,703**	**(7,714)**	6,195	13,088	(6,893)
Trading inventory – other	**19,574**	**n/a**	**n/a**	13,778	n/a	n/a
Consumer and commercial loans	**8,335**	**8,372**	**(37)**	4,349	4,399	(50)
Loans held-for-sale [1]	**3,709**	**4,879**	**(1,170)**	2,942	4,749	(1,807)
Other assets	**4**	**n/a**	**n/a**	3	n/a	n/a
Long-term deposits	**508**	**496**	**12**	492	454	38
Federal funds purchased and securities loaned or sold under agreements to repurchase	**16,008**	**16,029**	**(21)**	28,875	28,881	(6)
Short-term borrowings	**3,941**	**3,930**	**11**	1,648	1,648	—
Unfunded loan commitments	**90**	**n/a**	**n/a**	169	n/a	n/a
Long-term debt [2]	**34,975**	**35,730**	**(755)**	27,689	29,198	(1,509)

[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 $34.6 billion and $27.3 billion, and contractual principal outstanding of $35.3 billion and $28.8 billion at December 31, 2019 and 2018.

n/a = not applicable

Gains (Losses) Relating to Assets and Liabilities Accounted for Under the Fair Value Option

(Dollars in millions)	**Market making and similar activities**	**Other Income**	**Total**
		2019	
Loans reported as trading account assets	**$ 203**	**$ —**	**$ 203**
Trading inventory – other [1]	**5,795**	**—**	**5,795**
Consumer and commercial loans	**92**	**12**	**104**
Loans held-for-sale [2]	**—**	**98**	**98**
Long-term debt [3]	**(1,098)**	**(78)**	**(1,176)**
Other [4]	**(15)**	**52**	**37**
Total [5]	**$ 4,977**	**$ 84**	**$ 5,061**
		2018	
Loans reported as trading account assets	$ 8	$ —	$ 8
Trading inventory – other [1]	1,750	—	1,750
Consumer and commercial loans	(422)	(53)	(475)
Loans held-for-sale [2]	1	24	25
Long-term debt [3]	2,157	(93)	2,064
Other [4]	8	(31)	(23)
Total [5]	$ 3,502	$ (153)	$ 3,349
		2017	
Loans reported as trading account assets	$ 318	$ —	$ 318
Trading inventory – other [1]	3,821	—	3,821
Consumer and commercial loans	(9)	35	26
Loans held-for-sale [2]	—	298	298
Long-term debt [3]	(1,044)	(146)	(1,190)
Other [4]	(93)	49	(44)
Total [5]	$ 2,993	$ 236	$ 3,229

[1] The gains in market making and similar activities are primarily offset by losses on trading liabilities that hedge these assets.

[2] Includes the value of IRLCs on funded loans, including those sold during the period.

[3] The net gains (losses) in market making and similar activities relate to the embedded derivatives in structured liabilities and are typically offset by (losses) gains on derivatives and securities that hedge these liabilities. For the cumulative impact of changes in the Corporation's own credit spreads and the amount recognized in accumulated OCI, see *Note 15 – Accumulated Other Comprehensive Income (Loss)*. For more information on how the Corporation's own credit spread is determined, see *Note 21 – Fair Value Measurements.*

[4] Includes gains (losses) on federal funds sold and securities borrowed or purchased under agreements to resell, long-term deposits, federal funds purchased and securities loaned or sold under agreements to repurchase, short-term borrowings and unfunded loan commitments.

[5] Gains (losses) related to borrower-specific credit risk were $194 million, $(148) million and $38 million in 2019, 2018 and 2017, respectively.

NOTE 23 Fair Value of Financial Instruments

Financial instruments are classified within the fair value hierarchy using the methodologies described in *Note 21 – Fair Value Measurements*. Certain loans, deposits, long-term debt and unfunded lending commitments are accounted for under the fair value option. For more information, see *Note 22 – 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, 2019 and 2018 are presented in the following table.

Fair Value of Financial Instruments

		Fair Value		
	Carrying Value	Level 2	Level 3	Total
(Dollars in millions)	December 31, 2019			
Financial assets				
Loans	$ 950,093	$ 63,633	$ 914,597	$ 978,230
Loans held-for-sale	9,158	8,439	719	9,158
Financial liabilities				
Deposits [1]	1,434,803	1,434,809	—	1,434,809
Long-term debt	240,856	247,376	1,149	248,525
Commercial unfunded lending commitments [2]	903	90	4,777	4,867
	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	229,392	230,019	817	230,836
Commercial unfunded lending commitments [2]	966	169	5,558	5,727

[1] Includes demand deposits of $545.5 billion and $531.9 billion with no stated maturities at December 31, 2019 and 2018.

[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 13 – Commitments and Contingencies*.

NOTE 24 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, liquidating businesses and certain expenses not otherwise allocated to business segments. ALM activities encompass certain residential mortgages, debt securities, interest rate and foreign currency risk management activities. Substantially all of the results of 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 substantially all 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 2019, 2018 and 2017, and total assets at December 31, 2019 and 2018 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)	2019	2018	2017	2019	2018	2017
Net interest income	$ 49,486	$ 48,772	$ 46,164	$ 28,158	$ 27,025	$ 24,203
Noninterest income	42,353	42,858	41,887	10,429	10,593	10,101
Total revenue, net of interest expense	91,839	91,630	88,051	38,587	37,618	34,304
Provision for credit losses	3,590	3,282	3,396	3,772	3,664	3,525
Noninterest expense	54,900	53,154	54,517	17,618	17,672	17,847
Income before income taxes	33,349	35,194	30,138	17,197	16,282	12,932
Income tax expense	5,919	7,047	11,906	4,213	4,150	4,897
Net income	$ 27,430	$ 28,147	$ 18,232	$ 12,984	$ 12,132	$ 8,035
Period-end total assets	$ 2,434,079	$ 2,354,507		$ 804,019	$ 768,881	
	Global Wealth & Investment Management			**Global Banking**		
	2019	2018	2017	2019	2018	2017
Net interest income	$ 6,504	$ 6,265	$ 6,152	$ 10,675	$ 10,993	$ 10,615
Noninterest income	13,033	13,188	12,447	9,808	9,008	9,510
Total revenue, net of interest expense	19,537	19,453	18,599	20,483	20,001	20,125
Provision for credit losses	82	86	56	414	8	212
Noninterest expense	13,823	14,015	13,770	9,017	8,745	8,811
Income before income taxes	5,632	5,352	4,773	11,052	11,248	11,102
Income tax expense	1,380	1,364	1,807	2,984	2,923	4,204
Net income	$ 4,252	$ 3,988	$ 2,966	$ 8,068	$ 8,325	$ 6,898
Period-end total assets	$ 299,756	$ 305,907		$ 464,032	$ 442,330	
	Global Markets			**All Other**		
	2019	2018	2017	2019	2018	2017
Net interest income	$ 3,915	$ 3,857	$ 4,264	$ 234	$ 632	$ 930
Noninterest income	11,699	12,326	11,698	(2,616)	(2,257)	(1,869)
Total revenue, net of interest expense	15,614	16,183	15,962	(2,382)	(1,625)	(939)
Provision for credit losses	(9)	—	164	(669)	(476)	(561)
Noninterest expense	10,722	10,835	10,997	3,720	1,887	3,092
Income (loss) before income taxes	4,901	5,348	4,801	(5,433)	(3,036)	(3,470)
Income tax expense (benefit)	1,397	1,390	1,666	(4,055)	(2,780)	(668)
Net income (loss)	$ 3,504	$ 3,958	$ 3,135	$ (1,378)	$ (256)	$ (2,802)
Period-end total assets	$ 641,806	$ 641,923		$ 224,466	$ 195,466	

[1] There were no material intersegment revenues.

The table below presents noninterest income and the components thereto for 2019, 2018 and 2017 for each business segment, *All Other* and the total Corporation. For more information, see *Note 2 – Net Interest Income and Noninterest Income.*

Noninterest Income by Business Segment and All Other

	Total Corporation			Consumer Banking			Global Wealth & Investment Management		
(Dollars in millions)	**2019**	2018	2017	**2019**	2018	2017	**2019**	2018	2017
Fees and commissions:									
Card income									
Interchange fees	**$ 3,834**	$ 3,866	$ 3,777	**$ 3,174**	$ 3,196	$ 3,038	**$ 60**	$ 81	$ 109
Other card income	**1,963**	1,958	1,899	**1,910**	1,906	1,846	**41**	46	44
Total card income	**5,797**	5,824	5,676	**5,084**	5,102	4,884	**101**	127	153
Service charges									
Deposit-related fees	**6,588**	6,667	6,708	**4,219**	4,300	4,266	**68**	73	77
Lending-related fees	**1,086**	1,100	1,110	**—**	—	—	**—**	—	—
Total service charges	**7,674**	7,767	7,818	**4,219**	4,300	4,266	**68**	73	77
Investment and brokerage services									
Asset management fees	**10,241**	10,189	9,310	**144**	147	133	**10,130**	10,042	9,177
Brokerage fees	**3,661**	3,971	4,526	**149**	172	184	**1,740**	1,917	2,217
Total investment and brokerage services	**13,902**	14,160	13,836	**293**	319	317	**11,870**	11,959	11,394
Investment banking fees									
Underwriting income	**2,998**	2,722	2,821	**—**	(1)	—	**401**	335	316
Syndication fees	**1,184**	1,347	1,499	**—**	—	—	**—**	—	—
Financial advisory services	**1,460**	1,258	1,691	**—**	—	—	**—**	2	2
Total investment banking fees	**5,642**	5,327	6,011	**—**	(1)	—	**401**	337	318
Total fees and commissions	**33,015**	33,078	33,341	**9,596**	9,720	9,467	**12,440**	12,496	11,942
Market making and similar activities	**9,034**	9,008	7,102	**6**	8	3	**113**	112	144
Other income	**304**	772	1,444	**827**	865	631	**480**	580	361
Total noninterest income	**$ 42,353**	$ 42,858	$ 41,887	**$ 10,429**	$ 10,593	$ 10,101	**$ 13,033**	$ 13,188	$ 12,447

	Global Banking			Global Markets			All Other [1]		
	2019	2018	2017	**2019**	2018	2017	**2019**	2018	2017
Fees and commissions:									
Card income									
Interchange fees	**$ 519**	$ 503	$ 478	**$ 81**	$ 86	$ 86	**$ —**	$ —	$ 66
Other card income	**13**	8	12	**(1)**	(2)	(2)	**—**	—	(1)
Total card income	**532**	511	490	**80**	84	84	**—**	—	65
Service charges									
Deposit-related fees	**2,121**	2,111	2,197	**156**	161	147	**24**	22	21
Lending-related fees	**894**	916	928	**192**	184	182	**—**	—	—
Total service charges	**3,015**	3,027	3,125	**348**	345	329	**24**	22	21
Investment and brokerage services									
Asset management fees	**—**	—	—	**—**	—	—	**(33)**	—	—
Brokerage fees	**34**	94	97	**1,738**	1,780	2,049	**—**	8	(21)
Total investment and brokerage services	**34**	94	97	**1,738**	1,780	2,049	**(33)**	8	(21)
Investment banking fees									
Underwriting income	**1,227**	1,090	1,172	**1,555**	1,495	1,588	**(185)**	(197)	(255)
Syndication fees	**574**	648	742	**610**	698	756	**—**	1	1
Financial advisory services	**1,336**	1,153	1,557	**123**	103	133	**1**	—	(1)
Total investment banking fees	**3,137**	2,891	3,471	**2,288**	2,296	2,477	**(184)**	(196)	(255)
Total fees and commissions	**6,718**	6,523	7,183	**4,454**	4,505	4,939	**(193)**	(166)	(190)
Market making and similar activities	**235**	260	134	**7,065**	7,260	6,203	**1,615**	1,368	618
Other income	**2,855**	2,225	2,193	**180**	561	556	**(4,038)**	(3,459)	(2,297)
Total noninterest income	**$ 9,808**	$ 9,008	$ 9,510	**$ 11,699**	$ 12,326	$ 11,698	**$ (2,616)**	$ (2,257)	$ (1,869)

[1] *All Other* includes eliminations of intercompany transactions.

Business Segment Reconciliations

(Dollars in millions)	2019	2018	2017
Segments' total revenue, net of interest expense	$ 94,221	$ 93,255	$ 88,990
Adjustments [1]:			
ALM activities	241	(325)	161
Liquidating businesses, eliminations and other	(2,623)	(1,300)	(1,100)
FTE basis adjustment	(595)	(610)	(925)
Consolidated revenue, net of interest expense	$ 91,244	$ 91,020	$ 87,126
Segments' total net income	28,808	28,403	21,034
Adjustments, net-of-tax [1]:			
ALM activities	202	(222)	154
Liquidating businesses, eliminations and other	(1,580)	(34)	(2,956)
Consolidated net income	$ 27,430	$ 28,147	$ 18,232

	December 31	
	2019	2018
Segments' total assets	$ 2,209,613	$ 2,159,041
Adjustments [1]:		
ALM activities, including securities portfolio	721,806	669,204
Elimination of segment asset allocations to match liabilities	(565,346)	(540,798)
Other	68,006	67,060
Consolidated total assets	$ 2,434,079	$ 2,354,507

[1] Adjustments include consolidated income, expense and asset amounts not specifically allocated to individual business segments.

NOTE 25 Parent Company Information

The following tables present the Parent Company-only financial information.

Condensed Statement of Income

(Dollars in millions)	2019	2018	2017
Income			
Dividends from subsidiaries:			
Bank holding companies and related subsidiaries	$ 27,820	$ 28,575	$ 12,088
Nonbank companies and related subsidiaries	—	91	202
Interest from subsidiaries	9,502	8,425	7,043
Other income (loss)	74	(1,025)	28
Total income	37,396	36,066	19,361
Expense			
Interest on borrowed funds from related subsidiaries	451	235	189
Other interest expense	5,899	6,425	5,555
Noninterest expense	1,641	1,600	1,672
Total expense	7,991	8,260	7,416
Income before income taxes and equity in undistributed earnings of subsidiaries	29,405	27,806	11,945
Income tax expense (benefit)	341	(281)	950
Income before equity in undistributed earnings of subsidiaries	29,064	28,087	10,995
Equity in undistributed earnings (losses) of subsidiaries:			
Bank holding companies and related subsidiaries	(1,717)	306	8,725
Nonbank companies and related subsidiaries	83	(246)	(1,488)
Total equity in undistributed earnings of subsidiaries	(1,634)	60	7,237
Net income	$ 27,430	$ 28,147	$ 18,232

Condensed Balance Sheet

(Dollars in millions)	December 31 2019	2018
Assets		
Cash held at bank subsidiaries [1]	**$ 5,695**	$ 5,141
Securities	**656**	628
Receivables from subsidiaries:		
Bank holding companies and related subsidiaries	**173,301**	152,905
Banks and related subsidiaries	**51**	195
Nonbank companies and related subsidiaries	**391**	969
Investments in subsidiaries:		
Bank holding companies and related subsidiaries	**297,465**	293,045
Nonbank companies and related subsidiaries	**3,663**	3,432
Other assets	**9,438**	14,696
Total assets	**$ 490,660**	$ 471,011
Liabilities and shareholders' equity		
Accrued expenses and other liabilities	**$ 13,381**	$ 8,828
Payables to subsidiaries:		
Banks and related subsidiaries	**458**	349
Nonbank companies and related subsidiaries	**12,102**	13,301
Long-term debt	**199,909**	183,208
Total liabilities	**225,850**	205,686
Shareholders' equity	**264,810**	265,325
Total liabilities and shareholders' equity	**$ 490,660**	$ 471,011

[1] Balance includes third-party cash held of $4 million and $389 million at December 31, 2019 and 2018.

Condensed Statement of Cash Flows

(Dollars in millions)	2019	2018	2017
Operating activities			
Net income	**$ 27,430**	$ 28,147	$ 18,232
Reconciliation of net income to net cash provided by (used in) operating activities:			
Equity in undistributed (earnings) losses of subsidiaries	**1,634**	(60)	(7,237)
Other operating activities, net	**16,973**	(3,706)	(2,593)
Net cash provided by operating activities	**46,037**	24,381	8,402
Investing activities			
Net sales (purchases) of securities	**(17)**	51	312
Net payments to subsidiaries	**(19,121)**	(2,262)	(7,087)
Other investing activities, net	**7**	48	(1)
Net cash used in investing activities	**(19,131)**	(2,163)	(6,776)
Financing activities			
Net increase (decrease) in other advances	**(1,625)**	3,867	(6,672)
Proceeds from issuance of long-term debt	**29,315**	30,708	37,704
Retirement of long-term debt	**(21,039)**	(29,413)	(29,645)
Proceeds from issuance of preferred stock	**3,643**	4,515	—
Redemption of preferred stock	**(2,568)**	(4,512)	—
Common stock repurchased	**(28,144)**	(20,094)	(12,814)
Cash dividends paid	**(5,934)**	(6,895)	(5,700)
Net cash used in financing activities	**(26,352)**	(21,824)	(17,127)
Net increase (decrease) in cash held at bank subsidiaries	**554**	394	(15,501)
Cash held at bank subsidiaries at January 1	**5,141**	4,747	20,248
Cash held at bank subsidiaries at December 31	**$ 5,695**	$ 5,141	$ 4,747

NOTE 26 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]	**2019**	**$ 2,122,734**	**$ 81,236**	**$ 30,699**	**$ 25,937**
	2018	2,051,182	80,777	31,904	26,407
	2017		74,604	25,108	15,550
Asia	**2019**	**102,440**	**3,491**	**765**	**570**
	2018	94,865	3,507	865	520
	2017		3,405	676	464
Europe, Middle East and Africa	**2019**	**178,889**	**5,310**	**921**	**672**
	2018	185,285	5,632	1,543	1,126
	2017		7,907	2,990	1,926
Latin America and the Caribbean	**2019**	**30,016**	**1,207**	**369**	**251**
	2018	23,175	1,104	272	94
	2017		1,210	439	292
Total Non-U.S.	**2019**	**311,345**	**10,008**	**2,055**	**1,493**
	2018	303,325	10,243	2,680	1,740
	2017		12,522	4,105	2,682
Total Consolidated	**2019**	**$ 2,434,079**	**$ 91,244**	**$ 32,754**	**$ 27,430**
	2018	2,354,507	91,020	34,584	28,147
	2017		87,126	29,213	18,232

(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
ARR	Alternative reference rates
AUM	Assets under management
AVM	Automated valuation model
BANA	Bank of America, National Association
BHC	Bank holding company
BofAS	BofA Securities, Inc.
BofASE	BofA Securities Europe SA
bps	basis points
CAE	Chief Audit Executive
CAO	Chief Administrative Officer
CCAR	Comprehensive Capital Analysis and Review
CDO	Collateralized debt obligation
CDS	Credit default swap
CET1	Common equity tier 1
CFPB	Consumer Financial Protection Bureau
CLO	Collateralized loan obligation
CFTC	Commodity Futures Trading Commission
CLTV	Combined loan-to-value
CRO	Chief Risk Officer
CVA	Credit valuation adjustment
DIF	Deposit Insurance Fund
DVA	Debit valuation adjustment
EAD	Exposure at default
EMRC	Enterprise Model Risk Committee
EPS	Earnings per common share
ERC	Enterprise Risk Committee
EU	European Union
FCA	Financial Conduct Authority
FDIC	Federal Deposit Insurance Corporation
FDICIA	Federal Deposit Insurance Corporation Improvement Act of 1991
FHA	Federal Housing Administration
FHFA	Federal Housing Finance Agency
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
GDPR	General Data Protection Regulation
GLS	Global Liquidity Sources
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
IBOR	Interbank Offered Rates
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
NOL	Net operating loss
NSFR	Net Stable Funding Ratio
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
RMBS	Residential mortgage-backed securities
RSU	Restricted stock unit
SBLC	Standby letter of credit
SCCL	Single-counterparty credit limits
SBSDs	Security-based swap dealers
SEC	Securities and Exchange Commission
SLR	Supplementary leverage ratio
SOFR	Secured Overnight Financing Rate
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, Private Bank

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 and President of
European Union and Switzerland

Management Committee**

Michael C. Ankrom, Jr.
Global Banking Chief Risk Officer
and Enterprise Credit Risk Executive

Keith T. Banks
Vice Chairman, Wealth Management &
Head of Investment Solutions Group

Aditya Bhasin
Consumer, Small Business & Wealth
Management, Global Human Resources,
Corporate Audit & Credit Review, Legal
Technology, Third-Party Management
and Workspace Services Executive

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

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Central & Eastern Europe, the Middle
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Commodities Trading

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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

Holly O'Neill
Head of Consumer, Small Business &
Wealth Management Client Care

David Reilly
Global Banking & Markets, Enterprise
Risk & Finance Technology, and Core
Technology Infrastructure Executive

Lorna R. Sabbia
Head of Retirement and Personal
Wealth Solutions

Robert A. Schleusner
Head of Wholesale Credit

April Schneider
Head of Consumer & Small Business
Products

Thomas M. Scrivener
Consumer, Small Business & Wealth
Management Operations Executive

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Co-President of Asia Pacific, and
Head of Asia Pacific Global Corporate
and Investment Banking

Jin Su
Co-President, Asia Pacific and
Co-Head of Asia Pacific Fixed Income,
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David C. Tyrie
Head of Consumer & Small Business
Advanced Solutions and Digital Banking

Anne Walker
Global Real Estate and Strategic
Initiatives Executive

Ather Williams III
Head of Business Banking and Global
Banking and Markets Anti-Money
Laundering

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

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Bank of America Corporation

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Bank of America Corporation

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AmerisourceBergen Corporation

Maria T. Zuber
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E.A. Griswold Professor of Geophysics,
Massachusetts Institute of Technology

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, 2019, there were 163,072 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 2019 Annual Report on Form 10-K is available at http://investor.bankofamerica.com. The Corporation also will provide a copy of the 2019 Annual Report on Form 10-K (without exhibits) upon written request addressed to:

Bank of America Corporation
Office of the Corporate Secretary
Bank of America Corporate Center
100 North Tryon Street
NC1-007-56-06
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 Wealth Management 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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Are Not FDIC Insured	May Lose Value	Are Not Bank Guaranteed

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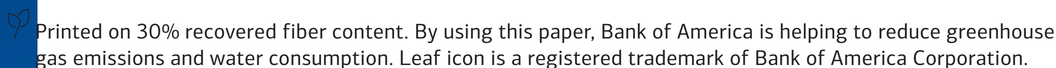

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