2021
ANNUAL REPORT

JPMorgan Chase & Co.

Financial Highlights

As of or for the year ended December 31, (in millions, except per share, ratio data and headcount)	2021	2020	2019
Selected income statement data			
Total net revenue[a]	$ 121,649	$ 119,951	$ 115,720
Total noninterest expense	71,343	66,656	65,269
Pre-provision profit[b]	50,306	53,295	50,451
Provision for credit losses	(9,256)	17,480	5,585
Net income	$ 48,334	$ 29,131	$ 36,431
Per common share data			
Net income per share:			
Basic	$ 15.39	$ 8.89	$ 10.75
Diluted	15.36	8.88	10.72
Book value per share	88.07	81.75	75.98
Tangible book value per share (TBVPS)[b]	71.53	66.11	60.98
Cash dividends declared per share	3.80	3.60	3.40
Selected ratios			
Return on common equity	19%	12%	15%
Return on tangible common equity (ROTCE)[b]	23	14	19
Liquidity coverage ratio (average)[c]	111	110	116
Common equity Tier 1 capital ratio[d]	13.1	13.1	12.4
Tier 1 capital ratio[d]	15.0	15.0	14.1
Total capital ratio[d]	16.8	17.3	16.0
Selected balance sheet data (period-end)			
Loans	$1,077,714	$1,012,853	$ 997,620
Total assets[a]	3,743,567	3,384,757	2,686,477
Deposits	2,462,303	2,144,257	1,562,431
Common stockholders' equity	259,289	249,291	234,337
Total stockholders' equity	294,127	279,354	261,330
Market data			
Closing share price	$ 158.35	$ 127.07	$ 139.40
Market capitalization	466,206	387,492	429,913
Common shares at period-end	2,944.1	3,049.4	3,084.0
Headcount	271,025	255,351	256,981

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to the Income Taxes footnote on pages 277-279 for further information.
(b) Pre-provision profit, TBVPS and ROTCE are each non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for additional information on these measures.
(c) Refer to Liquidity Risk Management on pages 97-104 for additional information on this measure.
(d) Refer to Capital Risk Management on pages 86-96 for additional information on these measures.

JPMorgan Chase & Co. (NYSE: JPM) is a leading global financial services firm with assets of $3.7 trillion and operations worldwide. The firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. A component of the Dow Jones Industrial Average, JPMorgan Chase & Co. serves millions of customers in the United States and many of the world's most prominent corporate, institutional and government clients under its J.P. Morgan and Chase brands.

Information about J.P. Morgan's capabilities can be found at jpmorgan.com and about Chase's capabilities at chase.com. Information about JPMorgan Chase & Co. is available at jpmorganchase.com.

$30B
ADVANCE RACIAL EQUITY

Deployed or committed more than $18 billion of $30 billion to advance racial equity

#1
CORPORATE & INVESTMENT BANK

Generated $21 billion of net income on record revenue of $52 billion

100%
2021 DISABILITY EQUALITY INDEX

Scored 100% on the 2021 Disability Equality Index for the seventh consecutive year

#1
UNDERWRITER OF GREEN BONDS

#1 underwriter of green bonds and ESG-labeled bonds

$2.5T
SUSTAINABLE DEVELOPMENT TARGET

Targeted $2.5 trillion for sustainable development activities, including $1 trillion to advance climate action

#1
CUSTOMER SATISFACTION

#1 in J.D. Power U.S. small business banking satisfaction

#1
TRADITIONAL MIDDLE MARKET LENDER

#1 traditional Middle Market bookrunner in the U.S.

TOP 10

Named to *Fortune* magazine's Most Admired Companies list

#1
MULTIFAMILY LENDER

#1 U.S. multifamily lender

84
U.S. WEALTH MANAGEMENT ADVISORS HONORED

Record number of wealth advisors ranked best in class

$389B
AWM CLIENT ASSET INFLOWS

$389 billion in total Asset & Wealth Management client asset inflows

LAUNCHED CHASE IN THE U.K.

Expanded Consumer Bank outside the U.S. for the first time

Dear Fellow Shareholders,

Jamie Dimon,
Chairman and
Chief Executive
Officer

We are facing challenges at every turn: a pandemic, unprecedented government actions, a strong recovery after a sharp and deep global recession, a highly polarized U.S. election, mounting inflation, a war in Ukraine and dramatic economic sanctions against Russia. While all this turmoil has serious ramifications on our company, its effect on the world — with the extreme suffering of the Ukrainian people and the potential restructuring of the global order — is far more important.

Adding to the disruption, these events are unfolding while America remains divided within its borders, with many arguing that it has lost its essential leadership role outside of its borders and around the world. But during this difficult time, we have a moment to put aside our differences, offer solutions and work with others in the Western world to come together in defense of democracy and essential freedoms, including free enterprise. We have seen America, in partnership with other countries around the globe, come together previously during instances of conflict and crisis. This juncture is also a moment when our country needs to work across the private and public sectors to lead once again by, among other remediations, improving American competitiveness and better fulfilling equal access to opportunity for all. JPMorgan Chase, a company that has historically worked across borders and boundaries, will do its part to ensure the global economy is safe and secure. I discuss these themes later in this letter.

Although I begin this annual letter to shareholders in a challenging landscape, I remain proud of what our company and our hundreds of thousands of employees around the world have achieved, collectively and individually. As you know, we have long championed the essential role of banking in a community — its potential for bringing people together, for enabling companies and individuals to reach for their dreams, and for being a source of strength in difficult times. Throughout these past two challenging years, we never stopped doing all the things we should be doing to serve our clients and our communities.

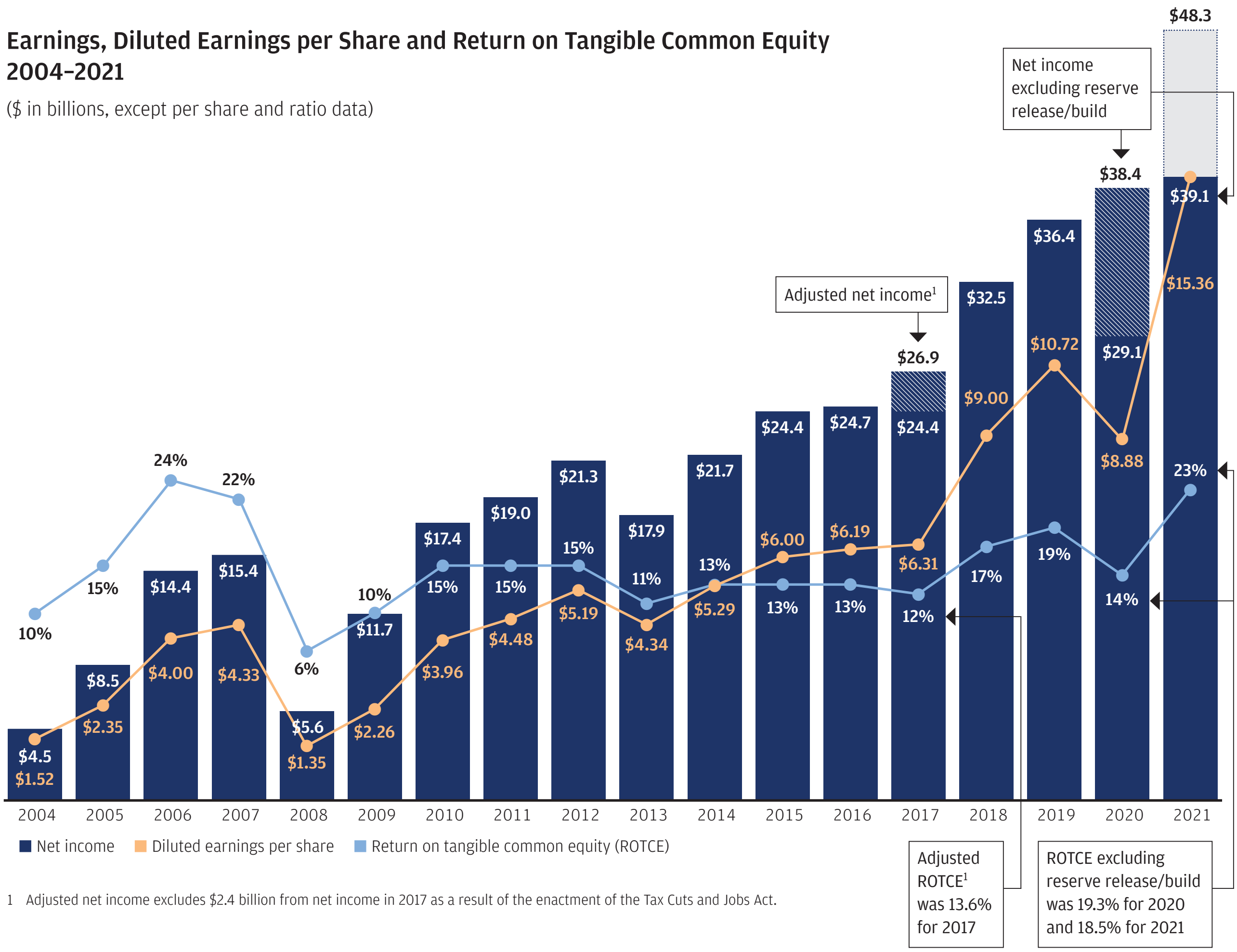
Looking back on the last year and the past two decades — starting from my time as CEO of Bank One in 2000 — it is clear that our financial discipline, constant investment in innovation and ongoing development of our people are what enabled us to persevere in our steadfast dedication to help clients, communities and countries throughout the world. 2021 was another strong year for JPMorgan Chase, with the firm generating record revenue, as well as setting numerous other records in each of our lines of business. We earned $48.3 billion in net income on revenue of $125.3 billion versus $29.1 billion on revenue of $122.9 billion in 2020, reflecting strong underlying performance across our businesses. Included in the $48.3 billion is $9.2 billion after tax in reserve releases due to the volatility introduced by the new current expected credit loss accounting standard. We have pointed out repeatedly that we do not consider these reserve releases core or recurring profits because they are driven by hypothetical, probability-weighted scenarios. Excluding these reserve releases, we still earned 18% on tangible equity — an extremely healthy number. We generally grew market share across our businesses and continued to make significant investments in products, people and technology, all while maintaining credit discipline and a fortress balance sheet. In total, we extended credit and raised capital of ***$3.2 trillion*** for large and small businesses, governments and U.S. consumers.

I'd like to note some steadfast principles that are worth repeating. The first is that while JPMorgan Chase stock is owned by large institutions, pension plans, mutual funds and directly by individual investors, in almost all cases, the ultimate beneficiaries are individuals in our communities. More than 100 million people in the United States own stock, and a large percentage of these individuals, in one way or another, own JPMorgan Chase stock. Many of these people are veterans, teachers, police officers, firefighters, healthcare workers, retirees or those saving for a home, education or retirement. Your management team goes to work every day recognizing the enormous responsibility that we have to our shareholders.

Second, while we don't run the company worrying about the stock price in the short run, in the **long run** our stock price is a measure of the progress we have made over the years. This progress is a function of *continual* investments in our people, systems and products, in good and bad times, to build our capabilities. Whether looking back 10 years or since the JPMorgan Chase/Bank One merger in 2004, these investments have resulted in our stock's significant outperformance of the Standard & Poor's 500 Index and the Standard & Poor's Financials Index. These important investments will also drive our company's future prospects and position it to grow and prosper for decades.

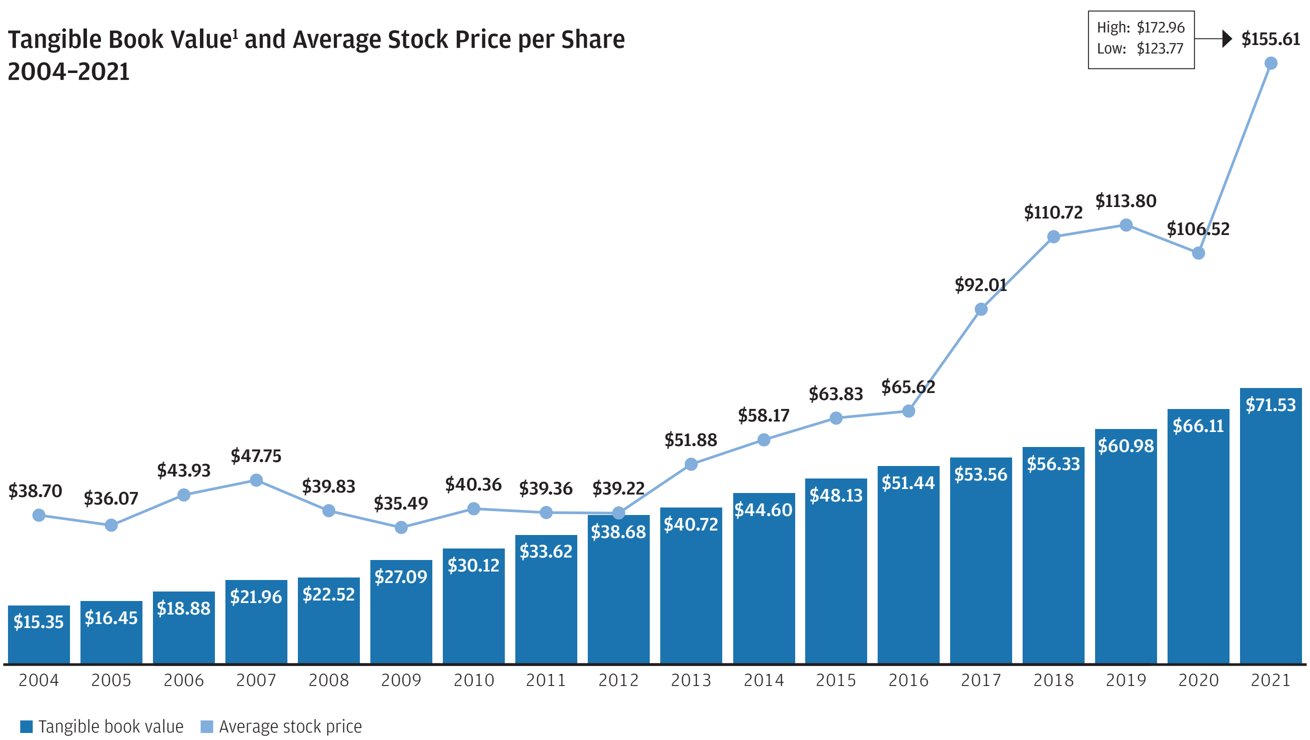
Earnings, Diluted Earnings per Share and Return on Tangible Common Equity 2004–2021

($ in billions, except per share and ratio data)



1 Adjusted net income excludes $2.4 billion from net income in 2017 as a result of the enactment of the Tax Cuts and Jobs Act.

Tangible Book Value[1] and Average Stock Price per Share 2004–2021



1 9% compound annual growth rate since 2004.

Stock total return analysis

	Bank One	S&P 500 Index	S&P Financials Index
Performance since becoming CEO of Bank One (3/27/2000–12/31/2021)[1]			
Compounded annual gain	12.6%	7.4%	5.3%
Overall gain	1,213.2%	373.5%	208.6%

	JPMorgan Chase & Co.	S&P 500 Index	S&P Financials Index
Performance since the Bank One and JPMorgan Chase & Co. merger (7/1/2004–12/31/2021)			
Compounded annual gain	11.3%	10.7%	5.3%
Overall gain	553.9%	494.4%	145.9%
Performance for the period ended December 31, 2021			
Compounded annual gain			
One year	27.7%	28.7%	34.9%
Five years	16.0%	18.5%	13.2%
Ten years	20.2%	16.5%	16.3%

These charts show actual returns of the stock, with dividends reinvested, for heritage shareholders of Bank One and JPMorgan Chase & Co. vs. the Standard & Poor's 500 Index (S&P 500 Index) and the Standard & Poor's Financials Index (S&P Financials Index).

1 On March 27, 2000, Jamie Dimon was hired as CEO of Bank One.

We have consistently described to you, our shareholders, the basic principles and strategies we use to build this company — from maintaining a fortress balance sheet, constantly investing and nurturing talent to fully satisfying regulators, continually improving risk, governance and controls, and serving customers and clients while lifting up communities worldwide.

If you look deeper, you will find that our success and accomplishments are founded on our commitment to our shareholders. Shareholder value can be built ***only*** if you maintain a healthy and vibrant company, which means doing a good job taking care of your customers, employees and communities. Conversely, how can you have a healthy company if you neglect any of these stakeholders? As we have learned in 2021, there are myriad ways an institution can demonstrate its compassion for its employees and its communities while still upholding shareholder value.

Adhering to our basic principles and strategies allows us to drive good organic growth and properly manage our capital (including dividends and stock buybacks), as we have consistently demonstrated over the past decades. All of this is shown in the charts on pages 8-12, which illustrate how we have grown our franchises, how we compare with our competitors and how we look at our fortress balance sheet. I invite you to peruse them at your leisure. In addition, I urge you to read the CEO letters in this Annual Report, which will give you more specific details about our businesses and our plans for the future.

There are two other critical points I would like to make. We strive to build enduring businesses, and we are not a conglomerate — all our businesses rely on and benefit from each other. Both of these factors help generate our superior returns. But, despite our best efforts, the moats that protect this company are not particularly deep — and we face extraordinary competition. I have written about this reality extensively in the past and cover it in more detail in this letter. However, it is the hand we have been dealt, and we will play it as best we can.

My friend, Warren Buffett, spoke in his letter this year about his silent partner — the U.S. government — noting that all his company's success is predicated upon the extraordinary conditions our country creates. He is right to say to his shareholders that when they see the flag, they should all say thank you. We should, too. I do just want to note that in our case, the silent partner is not so silent. JPMorgan Chase is a healthy and thriving company, and we always want to give back and pay our fair share. We do — and we want it to be spent well and have the greatest impact. To give you an idea of where our taxes and fees go: In the last 10 years, we paid $42 billion in federal, state and local taxes in the United States and $17 billion in taxes outside of the United States. We also paid the Federal Deposit Insurance Corporation $11 billion so that it has the resources to cover the failure of any major American bank.

Finally, the basis of our success is our people. They are the ones who serve our customers and communities, build the technology, make the strategic decisions, manage the risks, determine our investments and drive innovation. Whatever your view is of the world's complexity and the risks and opportunities ahead, having a great team of people — with guts, brains, integrity and enormous capabilities to navigate personally challenging circumstances while maintaining high standards of professional excellence — is what ensures our prosperity, now and in the future.

Client Franchises Built Over the Long Term

		2006	2011	2020	2021	
Consumer & Community Banking	Households (M)	~45	~55	63	66	■ Serve >66 million U.S. households and >5 million small business relationships
	Active mobile customers (M)	–	8.2	40.9	45.5	■ 59 million active digital customers[8], including 45 million active mobile customers[9]
	# of branches	3,079	5,508	4,908	4,790	■ Primary bank relationships for >75% of Consumer Banking checking households
	# of advisors[1]	NM	3,201	4,417	4,725	■ First bank to have branch presence in all contiguous 48 U.S. states
	Average deposits ($B)[1]	$204	$383	$851	$1,055	■ #1 U.S. credit card issuer based on sales and outstandings[10]
	Deposits market share[2]	4.4%	6.6%	9.6%	10.3%	■ #3 mortgage servicer[11]
	# of top 50 markets where we are #1 (top 3)	*7 (14)*	*6 (18)*	*8 (25)*	*8 (25)*	■ #2 bank auto lender[12]
	Business Banking primary market share[3]	5.1%	6.8%	9.5%	9.2%	■ Provided deferred payments and forbearance options for >2 million mortgages, auto loans and credit cards, representing ~$90 billion in balances[13]
	Client investment assets ($B)[1]	~$80	$138	$590	$718	■ #1 PPP lender on a dollar basis
	Total payments volume ($B)[4]	NA	~$1,500	$4,022	$4,997	
	% of digital non-card payments[5]	<25%	~40%	72%	75%	
	Credit card sales ($B)	*$257*	*$344*	*$703*	*$894*	
	Debit card sales ($B)	*NA*	*$189*	*$379*	*$467*	
	Debit & credit card sales volume ($B)	NA	$533	$1,081	$1,361	
	Credit card sales market share[6]	16%	20%	22%	22%	
	Credit card loans ($B, EOP)	$153	$132	$144	$154	
	Credit card loans market share[7]	19%	18%	17%	17%	
Corporate & Investment Bank	Global investment banking fees[14]	#2	#1	#1	#1	■ >90% of Fortune 500 companies do business with us
	Market share[14]	8.7%	8.2%	9.2%	9.5%	■ Presence in over 100 markets globally
	Total Markets revenue[15]	#8	#1	#1	#1	■ #1 in global investment banking fees for the 13th consecutive year[14]
	Market share[15]	6.3%	9.3%	12.7%	12.2%	■ Consistently ranked #1 in Markets revenue since 2011[15]
	FICC[15]	#7	#1	#1	#1	■ J.P. Morgan Research ranked as the #1 Global Research Firm, #1 Global Equity Research Team and #1 Global Fixed Income Research Team[19]
	Market share[15]	7.0%	10.1%	13.0%	12.5%	■ #1 in USD payments volume[20]
	Equities[15]	#8	#3	co-#1	co-#1	■ #1 in U.S. Merchant transaction processing[21]
	Market share[15]	5.0%	7.6%	12.2%	11.5%	■ #2 custodian globally[22]
	Assets under custody ($T)	$13.9	$16.9	$31.0	$33.2	
	Average client deposits ($B)[16]	$190	$319	$611	$715	
	Firmwide Payments revenue ($B)	$5.0	$6.1	$9.6	$10.3	
	Firmwide Payments revenue rank (share)[17]	NA	NA	#1 (6.7%)	#1 (7.2%)	
	Daily payment processing (T)[18]	NA	NA	>$8	>$9	
	Average daily security purchases and sales ($T)	NA	NA	$2.7	$2.9	
Commercial Banking	# of top 75 MSAs with dedicated teams	36	49	66	66	■ 140 locations across the U.S. and 32 international locations, with 27 new markets since 2018
	# of bankers	1,203	1,108	2,020	2,254	■ $1B revenue from Middle Market expansion markets, up 34% YoY
	New relationships (gross)	NA	NA	1,856	2,579	■ Credit, banking, and treasury services to ~23K Commercial & Industrial clients and ~32K real estate owners and investors
	Average loans ($B)	$53.6	$104.2	$218.9	$205.0	■ 18 specialized industry coverage teams
	Average deposits ($B)[23]	$73.6	$174.7	$237.8	$301.5	■ #1 overall Middle Market Bookrunner in the U.S.[27]
	Gross investment banking revenue ($B)[24]	$0.7	$1.4	$3.3	$5.1	■ Over 100,000 affordable housing units financed in 2021[28]
	Payments revenue ($B)[25]	$0.9	$1.1	$1.5	$1.8	
	Multifamily lending[26]	#28	#1	#1	#1	
Asset & Wealth Management	Mutual Funds with a 4/5-star rating[29]	119	146	183	206	■ 86% of 10-year JPMAM long-term mutual fund AUM performed above peer median[34]
	Client assets ($T)[30]	$1.3	$1.9	$3.7	$4.3	■ Business with 60% of the world's largest pension funds, sovereign wealth funds and central banks
	Traditional assets ($T)[30, 31]	$1.2	$1.6	$3.2	$3.7	■ #2 in 5-year cumulative net client asset flows behind BlackRock[35]
	Alternatives assets ($B)[30, 32]	$100	$157	$282	$353	■ Positive client asset flows across all regions, segments and products
	Deposits ($B)[30]	$52	$124	$199	$282	■ $58B in Alternatives fundraising
	Loans ($B)[30]	$30	$57	$187	$218	■ #2 in Institutional Money Market Funds AUM[36]
	# of Global Private Bank client advisors[30]	1,506	2,389	2,462	2,738	■ 60% of Asset Management AUM managed by female and/or diverse portfolio managers[37]
	Global Private Bank (*Euromoney*)[33]	#7	#4	#2	#1	
	U.S. Private Bank (*Euromoney*)[33]	#1	#1	#1	#1	

NM = Not meaningful
NA = Not available
EOP = End of period
FICC = Fixed income, currencies and commodities
MSAs = Metropolitan statistical areas

AUM = Assets under management
PPP = Paycheck Protection Program
USD = U.S. dollar
YOY = Year-over-year

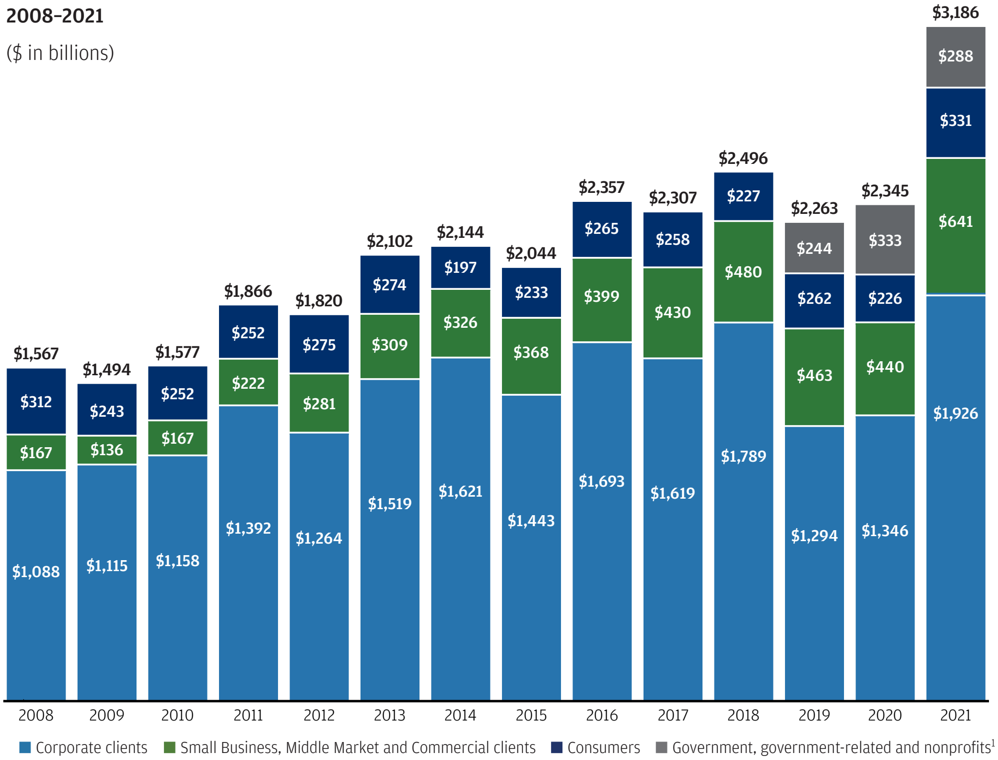
M = Millions
B = Billions
T = Trillions
K = Thousands

For footnoted information, refer to page 47 in this Annual Report.

New and Renewed Credit and Capital for Our Clients

2008–2021

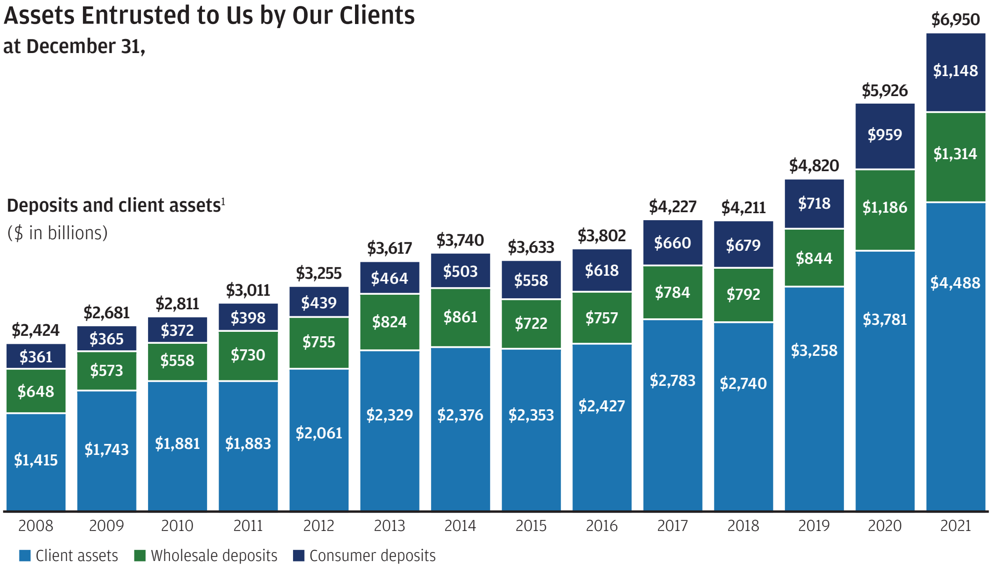
($ in billions)

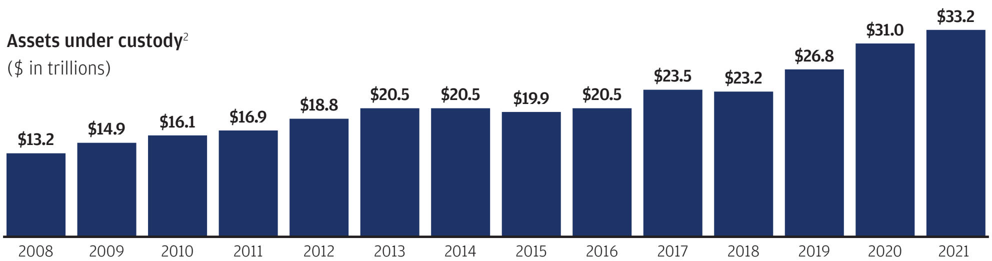


1 Government, government-related and nonprofits available for 2019–2021 only; included in Corporate clients and Small Business, Middle Market and Commercial clients for prior years.

Assets Entrusted to Us by Our Clients

at December 31,





1 Represents assets under management, as well as custody, brokerage, administration and deposit accounts.

2 Represents activities associated with the safekeeping and servicing of assets.

Fortress balance sheet

Selected data, for the year ended December 31,
(average, $ in trillions)

	2021	Change since 2008
Assets		
Liquid assets[1]	$ 1.7	443%
Loans[2]	1.0	76%
Trading assets[3]	0.5	4%
Total assets	3.7	108%
Liabilities and equity		
Deposits	2.3	199%
Trading liabilities[4]	0.2	10%
Preferred stock and long-term debt	0.3	16%
Common equity	0.3	94%
Total liabilities and equity	$ 3.7	108%

Income statement

Selected data, for the year ended December 31,
($ in billions)

	2021	Change since 2008
Revenue		
Noninterest income	$ 73	174%
Net interest income	53	14%
Total net revenue	125	72%
Expenses, credit costs and pre-tax profit		
Noninterest expense	71	64%
Net charge-offs	3	(71)%
Reserve build/(release)	(12)	(182)%
Pre-tax profit	$ 63	1,251%

1 Includes ~$700 billion cash, ~$450 billion United States Treasury securities and ~$150 billion agency mortgage-backed securities; reported high quality liquid assets (HQLA) is $738 billion and represents quarterly average HQLA included in the liquidity coverage ratio. Total reported eligible HQLA excludes average excess eligible HQLA at JPMorgan Chase Bank, N.A. that are not transferable to nonbank affiliates. Refer to liquidity coverage ratio on page 103 of the 2021 10-K for additional information.

2 Loans net of allowance for loan losses.

3 Includes trading assets for debt instruments, equity and other instruments and derivative receivables.

4 Includes trading liabilities for debt and equity instruments and derivative payables.

These assets are cash (essentially deposits at the Fed) and other highly marketable securities. This is an extraordinary amount of liquidity — approximately $700 billion is required by the liquidity coverage ratio and will always consist of the most conservative assets.

These are still our riskiest assets, but you can see how small they are relative to the size of our balance sheet.

The best way to ascertain actual risk is by looking at Advanced risk-weighted assets (RWA), which total only $1.1 trillion (excluding operational risk RWA) because so many assets have so little risk.

This is an extraordinary amount of consumer and wholesale deposits.

There is more than $500 billion in preferred stock, long-term debt and common equity, an extraordinary capital base. Equally important, the amount of unsecured short-term financing, the riskiest type, is negligible.

A large portion of our $125 billion of revenue is fairly recurring and predictable; for example, revenue from loans, Asset Management, Consumer Banking, Wealth Management, Securities Services and Payments. We've already told our shareholders that net interest income (excluding CIB Markets) will be more than $8 billion higher in 2022, primarily due to higher rates.

Our fortress balance sheet is accompanied by a fortress income statement. Even under extreme stress, our company could make a profit. For example, if credit losses were $10 billion higher or more, if we had a $10 billion operational error or if certain asset-based revenue dropped by as much as $10 billion, we would still be in very good shape.

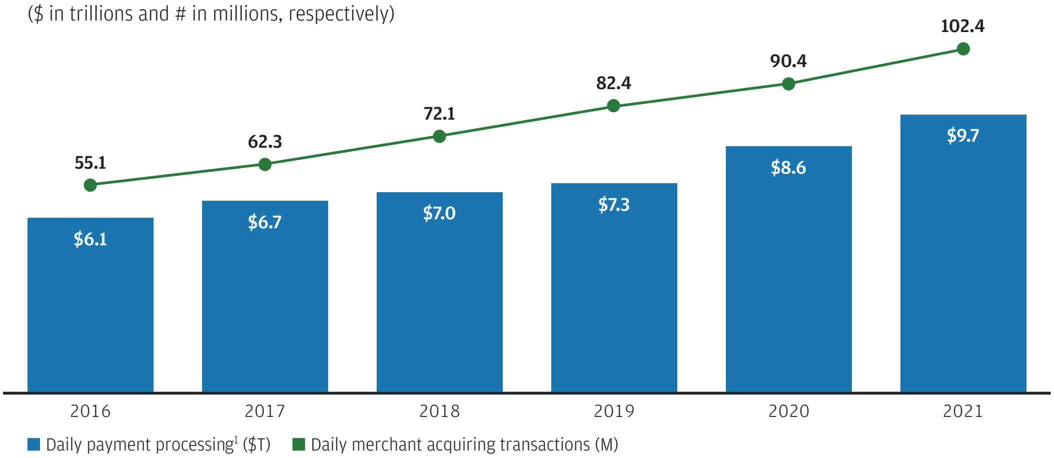
We tend to look at this number on a more normalized basis. For example, charge-offs are artificially low in this part of the cycle (a more normal amount would be $7 billion versus $3 billion), and we don't consider the reserve release of $12 billion as core or recurring profits. If you adjust for this and add back the $8 billion of normalized higher net interest income[1], our normalized pre-tax profit would be closer to $50+ billion.

And in terms of capital preservation, we could, if we had to, cut the dividend to zero, saving $12 billion in a year. Or we could reduce expenses substantially — which we could easily achieve.

1 Excluding CIB Markets net interest income.

Daily Payment Processing and Merchant Acquiring Transactions

($ in trillions and # in millions, respectively)

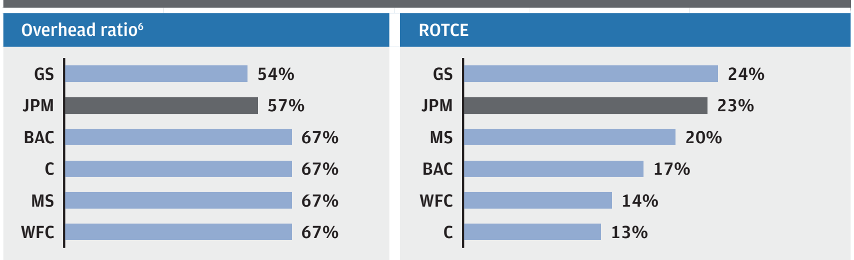


1 Based on Firmwide data using regulatory reporting guidelines as prescribed by the Federal Reserve Board.

JPMorgan Chase Is in Line with Best-in-Class Peers in Both Efficiency and Returns

	Efficiency		Returns		
	JPM 2021 overhead ratio	Best-in-class peer overhead ratio[1]	JPM 2021 ROTCE	Best-in-class all banks ROTCE[2,4]	Best-in-class G-SIB ROTCE[3,4]
Consumer & Community Banking	58%	51% COF-DC & CB	41%	31% BAC-CB	31% BAC-CB
Corporate & Investment Bank	49%	53% GS-IB & GM	25%	26% GS-IB & GM	26% GS-IB & GM
Commercial Banking	40%	42% PNC	21%	20% Key	15% WFC-CB
Asset & Wealth Management	64%	59% CS-PB & TROW	33%	48% UBS-GWM & MS-IM	47% MS-WM & IM

JPMorgan Chase compared with large peers[5]



ROTCE = Return on tangible common equity
G-SIB = Global Systemically Important Banks
For footnoted information, refer to page 47 in this Annual Report.

Within this letter, I discuss the following:

Significant Geopolitical and Economic Challenges

America and the rest of the world are facing the confluence of three important and conflicting forces: 1) a strong U.S. economy, which, we hope, has COVID-19 in its rearview mirror; 2) high inflation, which means rising interest rates and, importantly, the reversal of quantitative easing (QE); and 3) the war in Ukraine and the accompanying humanitarian crisis, with its impact on the global economy in the short term, as well as its significant impact on the geopolitics of the future. These factors will likely have a meaningful effect on the economy over the next few years and on geopolitics for the next several decades.

I should remind the reader that we normally don't worry about – or even try to predict – normal fluctuations of the economy. In all times, we are prepared for difficult markets and severe recessions, as well as for unpredictable events, not only so we will survive them but also so we can be there for our clients when they need us the most. However, sometimes there are powerful underlying structural trends that we must try to understand since their impact can be so large, with widespread impact on many parts of human existence.

THE U.S. ECONOMY IS STRONG.

In 2020 and 2021, enormous QE – approximately $4.4 trillion, or 18%, of 2021 gross domestic product (GDP) – and enormous fiscal stimulus (which has been and always will be inflationary) – approximately $5 trillion, or 21%, of 2021 GDP – stabilized markets and allowed companies to raise enormous amounts of capital. In addition, this infusion of capital saved many small businesses and put more than $2.5 trillion in the hands of consumers and almost $1 trillion into state and local coffers. These actions led to a rapid decline in unemployment, dropping from 15% to under 4% in 20 months – the magnitude and speed of which were both unprecedented. Additionally, the economy grew 7% in 2021 ***despite*** the arrival of the Delta and Omicron variants and the global supply chain shortages, which were largely fueled by the dramatic upswing in consumer spending and the shift in that spend from services to goods. Fortunately, during these two years, vaccines for COVID-19 were also rapidly developed and distributed.

In today's economy, the consumer is in excellent financial shape (on average), with leverage among the lowest on record, excellent mortgage underwriting (even though we've had home price appreciation), plentiful jobs with wage increases and more than $2 trillion in excess savings, mostly due to government stimulus. Most consumers and companies (and states) are still flush with the money generated in 2020 and 2021, with consumer spending over the last several months 12% above pre-COVID-19 levels. (But we must recognize that the account balances in lower-income households, smaller to begin with, are going down faster and that income for those households is not keeping pace with rising inflation.)

Today's economic landscape is completely different from the 2008 financial crisis when the consumer was extraordinarily overleveraged, as was the financial system as a whole – from banks and investment banks to shadow banks, hedge funds, private equity, Fannie Mae and many other entities. In addition, home price appreciation, fed by bad underwriting and leverage in the mortgage system, led to excessive speculation, which was missed by virtually everyone – eventually leading to nearly $1 trillion in actual losses.

During 2020 and 2021, many aberrant things also happened: 2 million people retired early; the supply of immigrant workers dropped by 1 million due to immigration policies; available jobs skyrocketed to 11 million (again unprecedented); and job seekers dropped to 5 million. Wage growth accelerated dramatically, particularly in low-income jobs. We should not be unhappy that wages are going up – and that workers have more choices and are making different decisions — in spite of the fact that this causes some difficulties for business. House prices surged during the pandemic (housing became and still is in extremely short supply), and asset prices remained high, some, in my view, in bubble territory. Inflation soared to 7%; while clearly some of this rise is transitory due to supply chain shortages, some is not, because higher wages, higher housing costs, and higher energy and commodity prices will persist (more to come on this later). All these factors will continue in 2022, driving further growth as well as continued inflation. One additional point: Consumer confidence and consumer spending have diverged dramatically, with consumer confidence dropping. Spending, however, is more important, and the drop in consumer confidence may be in reaction to ongoing fatigue from the pandemic shutdown and concerns over high inflation.

PERSISTENT INFLATION WILL REQUIRE RISING INTEREST RATES AND A MASSIVE BUT NECESSARY SHIFT FROM QUANTITATIVE EASING TO QUANTITATIVE TIGHTENING.

It is easy to second-guess complex decisions after the fact. The Federal Reserve (the Fed) and the government did the right thing by taking bold dramatic actions following the misfortune unleashed by the pandemic. In hindsight, it worked. But also in hindsight, the medicine (fiscal spending and QE) was probably too much and lasted too long.

I do not envy the Fed for what it must do next: The stronger the recovery, the higher the rates that follow (I believe that this could be significantly higher than the markets expect) and the stronger the quantitative tightening (QT). If the Fed gets it just right, we can have years of growth, and inflation will eventually start to recede. In any event, this process will cause lots of consternation and very volatile markets. The Fed should not worry about volatile markets unless they affect the ***actual*** economy. A strong economy trumps market volatility.

This is in no way traditional Fed tightening — and there are no models that can even remotely give us the answers. I have always been critical of people's excessive reliance on models — since they don't capture major catalysts, such as culture, character and technological advances. And in our current situation, the Fed needs to deal with things it has never dealt with before (and are impossible to model), including supply chain issues, sanctions, war and a reversal of QE in the face of unparalleled inflation. Obviously, the Fed always needs to be data-dependent, and this is true today more than ever before. However, the data will likely continue to be inconsistent and volatile — and hard to read. The Fed should strive for consistency but not when it's impossible to achieve.

One thing the Fed should do, and seems to have done, is to exempt themselves — give themselves ultimate flexibility — from the pattern of raising rates by only 25 basis points and doing so on a regular schedule. And while they may announce how they intend to reduce the Fed balance sheet, they should be free to change this plan on a moment's notice in order to deal with actual events in the economy and the markets. A Fed that reacts strongly to data and events in real time will ultimately create more confidence. In any case, rates will need to go up substantially. The Fed has a hard job to do so let's all wish them the best.

The shift from QE to QT will cause a massive change in the flow of funds in and out of Treasury bonds and, therefore, all securities. Our situation today is completely unlike the monetary policy adjustments following the great financial crisis of 2008. When central banks were buying bonds from 2008 to 2014, there was a tremendous amount of deleveraging in the rest of the financial world. Clearly, this deleveraging slowed growth, which in turn reduced the need for business investment. In addition, banks were required to buy Treasuries to meet their new liquidity requirements. This action reduced both lending and the money supply in the years after the great financial crisis. Low growth also led to less capital needed, and QE added to the savings glut. I am still convinced that these are some of the primary reasons our economy experienced low growth and so-called "secular stagnation."

In today's economic environment, countries' central banks do not need to increase their foreign exchange reserves as they did after the great financial crisis, and banks don't need to buy Treasuries to improve their liquidity ratios. This time around, business investment will likely be higher, both because of higher growth and because the capital required to combat climate change is estimated to be more than $4 trillion annually. Finally, governments will also need to borrow more money — not less.

This massive change in the flow of funds triggered by Fed tightening is certain to have market and economic effects that will be studied for decades to come. Our bank is prepared for drastically higher rates and more volatile markets.

THE WAR IN UKRAINE AND THE SANCTIONS ON RUSSIA, AT A MINIMUM, WILL SLOW THE GLOBAL ECONOMY — AND IT COULD EASILY GET WORSE.

The effects of geopolitics on the economy are harder to predict. For as much attention as it gets, geopolitics over the past 50 years have rarely disrupted the global economy in the short run (think Afghanistan; Iraq; Korea; Vietnam; conflicts between Pakistan and India, India and China, China and Vietnam, Russia and China; and at least 10 other upheavals and wars in the Middle East). The 1973 Organization of the Petroleum Exporting Countries, or OPEC, oil embargo was an exception, when the sharp jump in oil prices pushed the world into a global recession. However, it's important to point out that while past geopolitical events often did not have short-term economic effects, they frequently had large, longer-term consequences — such as America's experience with the Vietnam War, which drove the great inflation of the 1970s and 1980s and tore the body politic apart.

As I write this letter, the war in Ukraine has been raging for well over a month and is creating a significant refugee crisis. We do not know what its outcome ultimately will be, but the hostilities in Ukraine and the sanctions on Russia are already having a substantial economic impact. They have roiled global oil, commodity and agricultural markets. We expect the fallout from the war and resulting sanctions to reduce Russia's GDP by 12.5% by midyear (a decline worse than the 10% drop after the 1998 default). Our economists currently think that the euro area, highly dependent on Russia for oil and gas, will see GDP growth of roughly 2% in 2022, instead of the elevated 4.5% pace we had expected just six weeks ago. By contrast, they expect the U.S. economy to advance roughly 2.5% versus a previously estimated 3%. But I caution that these estimates are based upon a fairly static view of the war in Ukraine and the sanctions now in place.

Many more sanctions could be added — which could dramatically, and unpredictably, increase their effect. Along with the unpredictability of war itself and the uncertainty surrounding global commodity supply chains, this makes for a potentially explosive situation. I speak later about the precarious nature of the global energy supply, but for now, simply, that supply is easy to disrupt. (We should also keep in mind that, as a percentage of global GDP, oil is only about 40% of what it was in 1973 — but it is still essential and critical.)

THE CONFLUENCE OF THESE FACTORS MAY BE UNPRECEDENTED.

Each of these three factors mentioned above is unique in its own right: The dramatic stimulus-fueled recovery from the COVID-19 pandemic, the likely need for rapidly raising rates and the required reversal of QE, and the war in Ukraine and the sanctions on Russia. They present completely different circumstances than what we've experienced in the past — and their confluence may dramatically increase the risks ahead.

While it is possible, and hopeful, that all of these events will have peaceful resolutions, we should prepare for the potential negative outcomes. In the next section, I discuss immediate actions we should take to protect us from potential serious problems.

THE WAR COULD AFFECT GEOPOLITICS FOR DECADES.

Russian aggression is having another dramatic and important result: It is coalescing the democratic, Western world — across Europe and the North Atlantic Treaty Organization (NATO) countries to Australia, Japan and Korea. The United States and the West realize there is no replacement for strong allies and strong militaries.

The war and prior trade disputes with China also highlight the critical importance of economic relationships and trade, particularly trade that involves anything affecting national security. The outcome of these two issues will transcend Russia and likely will affect geopolitics for decades, potentially leading to both a realignment of alliances and a restructuring of global trade. How the West comports itself, and whether the West can maintain its unity, will likely determine the future global order and shape America's (and its allies') important relationship with China, which I talk more about later in this letter.

HOW ARE WE MANAGING OUR GLOBAL BANK IN THESE DIFFICULT MARKETS AND COMPLEX TIMES?

Our hearts go out to all of those affected by the war — JPMorgan Chase and its employees have already donated over $5 million to the Ukrainian humanitarian crisis, with more to come.

JPMorgan Chase has also played its part in the implementation of the Western world's policies and sanctions regarding Russia. Of course, we are following both the letter of the law and the spirit of all the American and allied sanctions, working hand in hand with governments to implement complex policies and directives, and then some. Managing this has been an enormous undertaking. It is completely different from navigating a financial crisis or a severe recession. This entails sanctioning individuals, including their ownership of assets and companies; reducing exposures across multiple products and services; analyzing and stopping billions of dollars of payments as directed by governments; and many other actions.

We are not worried about our direct exposure to Russia, though we could still lose about $1 billion over time. But we are actively monitoring the impact of ongoing sanctions and Russia's response, concerned as well about their secondary and collateral effects on so many companies and countries. We have been steadfast in our operating principles to be prepared for the unpredictable. Rest assured that our management teams, hundreds of us, globally, have been working around the clock to do the right thing.

The Extraordinary Need for Strong American Leadership

Even before the war in Ukraine jeopardized the world order, we were facing exceptional and enormous global challenges — nuclear proliferation (this is still the biggest risk to mankind, bar none, and made all the more stark by the war in Ukraine), threats to cybersecurity, terrorism, climate change, pressures on free and fair trade, and vast inequities in society. Critical to solving these problems is strong American leadership. American global leadership is the best course for the world ***and for America*** — and our leadership needs to articulate to its citizens why this is the case. The war in Ukraine reminds us that in a troubled world, national security always becomes the paramount concern. We should never again forget that this is true even in peaceful times — and we should never again be lulled into a false sense of security. Power abhors a vacuum, and it should be increasingly clear to all that without strong American leadership, chaos likely will prevail.

The world does not want an arrogant America telling everyone what to do but, instead, wants America working with allies, collaborating and compromising. Most of the world would applaud mature, respectful and civil leadership by America. We can organize military and economic frameworks that make the world safe and prosperous for democracy and freedom ***only*** if we work with our allies.

If Western allies across Europe and Asia realize there is power in strong partnership, it puts the Western world in a better position to address future challenges, including those posed by China's growth. This is applicable to areas where we have common interests (e.g., anti-terrorism, nuclear proliferation, climate change), as well as to areas where we may not (e.g., economic and political competition).

It also is clear that trade and supply chains, where they affect matters of national security, need to be restructured. You simply cannot rely on countries with different strategic interests for critical goods and services. Such reorganization does not need to be a disaster or decoupling. With thoughtful analysis and execution, it should be rational and orderly. This is in everyone's best interest.

WHILE AMERICA HAS FLAWS, ITS ESSENTIAL STRENGTHS ENDURE.

Many feel despondent about the "decline" of America. Our economy has had anemic growth for decades. COVID-19 and George Floyd's murder cast a spotlight on what we already knew — that our lower-income citizens, often minorities, suffer more in our society, particularly during recessions and times of turmoil. Continuing income inequality may very well be causing growing partisanship, as some people believe the American dream is fraying and that our system is unfair, leaving many of our citizens behind.

In prior letters, I have detailed our poor management of basic policy in America and what the consequences have been from that dysfunction: ineffective education systems, soaring healthcare costs, excessive regulation and bureaucracy, the inability to plan and build infrastructure efficiently, inequitable taxes, a capricious and wasteful litigation system, frustrating immigration policies and reform, inefficient mortgage markets and housing policy, a partially untrained and unprepared labor force, excessive student debt, and the lack of proper federal government budgeting and spending, which lead to huge inefficiencies. Since I have covered these issues at length in the past, I will not elaborate on them here. I do, however, want to point out (and I find it disheartening) how readily we accept the failure, often with a chuckle, of our bureaucracy and policies.

Our country is not perfect, but our basic principles — i.e., the rule of law, individual liberties, freedom of speech and religion, and the concept of equal opportunity — are still exceptional ideals that most of the world wants yet often is not able to achieve. These principles still make America the partner of choice for many countries and the destination of choice for many individuals. Our American system gave us one of the world's most prosperous and innovative economies. I do not like it when anyone disparages this wonderful country because of our flaws. Though our sins may be real, they are the sins of all countries. We can celebrate this country for having given so much to so many while acknowledging prior mistakes and fixing them. It is shocking to me how many people denigrate not just America but free enterprise and the essential role of business. If America could open its borders to all, I have little doubt that billions of people, if they could, would want to come here, and few would leave.

America has faced tough times before — the Civil War, World War I, the U.S. stock market crash of 1929 and the Great Depression that followed, World War II and 9/11, among others. As recently as the late 1960s and 1970s, we struggled with the loss of the Vietnam War, political and racial injustice, recessions and inflation. (Do you remember America's obsession and fear about the emergence of Japan as an economic power in the 1980s?) In each case, however, America's resiliency persevered and ultimately strengthened our position in the world. We hope this time is no different, but we should not be complacent as we do not have a divine right to success.

TO MAINTAIN OUR COMPETITIVENESS, OUR COUNTRY MUST REGAIN ITS COMPETENCE — AND OUR PRINCIPLES, INCLUDING FREE ENTERPRISE, NEED TO BE NURTURED.

America's moral, economic and military might all derive from our principles and are also predicated on the strength and ***competence*** of the American system. We must acknowledge that nurturing and maintaining our enormously prosperous economy provides the foundation of that system. Ultimately, that economy is what pays for the best military the world has ever seen.

Over the past 20 years, our economy has grown, on average, at only 2%. American ingenuity, work ethic, technology and business capability were able to overcome some — but not all — of our mismanagement. We should not accept mediocrity; we no longer imagine what should be: Over the past decade, we should have grown at 3.5%.

Freedom and its brother, free enterprise, ***properly regulated*** are the answer — not unconstrained capitalism nor crony capitalism, where business uses government and regulations to maintain its position or strengthen its hand. All interest groups, business groups included, should applaud good public policy and not resist it for self-serving reasons.

Free enterprise celebrates, and is inseparable from, human freedom and creativity, which ultimately are the sources of all human progress. The secret sauce of free enterprise is not only the free movement of capital but also, more importantly, the value of knowledge and free people exercising their rights.

Nonetheless, many countries — inadvertently through decades of following bad policy or deliberately by restricting freedoms — damage the full benefit of free enterprise and often discourage savings, innovation, and the free movement of people and labor. We all believe in great social safety nets that reduce poverty, provide opportunity for good jobs and serve as an engine for economic growth. But freedom slowly disappears when a country's government controls too much of its economy, and people in nearly every country, free or not, do not like constantly being told what to do. It is disingenuous when political leaders say that government "built the roads" and then use that statement as an argument to suppress free enterprise. The roads were built by the people and for the people so that all could travel and prosper.

What we really need are free enterprise, more civic-minded companies and citizens, and ***extraordinarily competent government and policies***.

GOVERNMENT, WITH ITS UNIQUE POWERS, HAS AN ESSENTIAL ROLE IN MANAGING THE ECONOMY — BUT IT NEEDS TO BE REALISTIC ABOUT *ITS* LIMITATIONS ON WHAT IT CAN AND CANNOT DO.

We have fallen into the rut of false narratives, which distracts us from facing reality. We don't define our problems properly. If you have the wrong diagnosis of a problem, you will certainly have the wrong solution. Even if you have the right diagnosis, you still may arrive at the wrong solution — but your odds are certainly much better. Our policies are often incomprehensible and uncoordinated, and our policy decisions frequently have no forethought and no identification of ***desired outcomes***.

We sometimes blame inflation on corporate profits — for example, the cost of meat in the United States is high not because of the profits earned by the meat packing industry but because of high cattle and feed costs and disruptions in logistics. Similarly, energy costs are high not because of price gouging but because of the dramatic decline in investments in energy, which results in reduced supply when demand goes up. Regulation has dramatically impeded our ability to build good infrastructure in a timely manner — the cost of building a highway has more than tripled in 20 years purely because of expenses due to regulations.

Our politics are dysfunctional, which has prevented some of our best, brightest and most competent to want to work in government. While we have plenty of economists, academics and lifetime politicians in government, who I know are committed to doing their best, we need additional brainpower, capabilities and experience from leaders across all sectors of our society, including business. It is going to take extraordinary, broad-based leadership to solve our problems.

There are some things only the federal government can do — among them, protect national security, operate federal courts, act as a central bank, perform certain research and development (R&D), and execute some national infrastructure. While government cannot create jobs outside of government itself, it can ***optimize the conditions*** under which jobs can be created. If it simply exhibits consistency and competence in the performance of its tasks, government will maximize investments and jobs. Conversely, government can destroy jobs and capital investment through bureaucracy, red tape and constant policy changes. Government cannot and will not be able to hold back technology, but it can foster an environment that promotes quick retraining of those who are replaced by technological advancements.

Our problems are neither Democratic nor Republican — nor are the solutions. Unfortunately, however, partisan politics are preventing collaborative policy from being designed and implemented, particularly at the federal level. We would do better if we listened to one another.

Democrats should acknowledge Republicans' legitimate concerns that money sent to Washington often ends up in large wasteful programs, ultimately offering little value to local communities. Democrats could acknowledge that while we need good government, it is not the answer to everything. Democrats could also acknowledge that a healthy fear of a large central government is not irrational (like a leviathan).

Republicans need to acknowledge that America can and should afford to provide a proper safety net for our elderly, our sick and our poor, as well as help create an environment that generates more opportunities and more income for more Americans. Republicans could acknowledge that if the government can ***demonstrate*** that it is spending money wisely, we should spend more — think infrastructure and education funding. And that may very well mean higher taxes for the wealthy. Should that happen, the wealthy should keep in mind that if tax monies improve our society and our economy, then those same individuals will be, in effect, among the main beneficiaries.

Democrats and Republicans often seem to be ships passing in the night — with both parties talking at cross purposes even when they may share the same goals. Compromise is not incompatible with democracy — in fact, compromise is a core principle of democracy. Enacting major policies on a purely partisan basis (think health-care and tax reform) virtually guarantees decades of fighting. It's not unreasonable to assert that major policies should be bipartisan or not at all.

We must remember that the concepts of free enterprise, rugged individualism and entrepreneurship are not incompatible with meaningful safety nets and the desire to lift up our disadvantaged citizens. We can acknowledge the exceptional history of America ***and*** also acknowledge our flaws, which need redress.

WE MUST CONFRONT THE RUSSIA CHALLENGE WITH BOLD SOLUTIONS.

America must be ready for the possibility of an extended war in Ukraine with unpredictable outcomes. We should prepare for the worst and hope for the best. We must look at this as a wake-up call. We need to pursue short-term and long-term strategies with the goal of not only solving the current crisis but also maintaining the ***long-term unity*** of the newly strengthened democratic alliances. We need to make this a ***permanent, long-lasting*** stand for democratic ideals and against all forms of evil.

Our nation's solutions need to be bold, brave and dynamic — and they ***have to be bipartisan*** — because we know only bipartisan solutions stand on firm ground. Bipartisanship could start with the appointment of Republicans to the cabinet. We need to think broadly because whatever we do will not only help determine the fate of the war in Ukraine but likely will determine the ability of the Western democratic world to address critical future challenges. We also need to ensure that the Western coalition remains economically competitive on the world stage. The better America performs as a country in dealing with Russia now, the easier it will be for us to engage with the rest of the world, including China, going forward.

In addition to being big, clear-eyed and realistic, our solutions should acknowledge that we are essentially, and unfortunately, reverting to some Cold War strategies. Here are some actions we should take immediately:

- Demonstrate leadership and commitment to a ***long-term*** military strategy by meaningfully increasing our military budget and troop deployment on NATO's borders, as appropriate. To both sides, these steps make our resolve clear and reflect our recognition of the grave new geopolitical realities.
- Direct billions of dollars in aid to Ukraine, announced now, to support the country currently and to help rebuild in the future. We should also help the Europeans with the enormous migration issues they are facing. The United States could take the lead in humanitarian efforts and ask all nations, including China, to join us in this response.
- Turn up sanctions — there are many more that could be imposed — in whatever way national security experts recommend to maximize the right outcomes.
- We need a "Marshall Plan" to ensure energy security for us and our European allies. Our European allies, who are highly dependent on Russian energy, ***require*** our help. For such a plan to succeed, we need to secure proper energy supplies immediately for the next few years, which can be done while reducing CO_2 emissions.

  As we are seeing — and know from past experience — oil and gas supply can be easily disrupted, either physically or by additional sanctions, significantly impacting energy prices. National security demands energy security for ourselves and for our allies overseas. Fortunately, we do not need to change our ***long-term objectives*** on climate change and greenhouse gases, and we should remind ourselves that using gas to diminish coal consumption is an actionable way to reduce CO_2 emissions expeditiously. While the United States is fairly energy independent, we need to increase our energy production and get more gas (in the form of liquefied natural gas) to Europe immediately. Our work with all of our allies should include urging them to both increase their production and deliver some of it to Europe. To do this, we also need immediate approval for additional oil leases and gas pipelines, as well as permits for green energy projects; i.e., solar and wind. We cannot accomplish our goals with misguided and counterproductive policies.

Strong, bold and comprehensive short-term and long-term policies, persistently and properly executed, will maximize the strength and the durable unity of the democratic world. Not only will this be very good for the Western world in general, but it will help frame our approach with China.

A STRONG AMERICA NEED NOT FEAR A RISING CHINA.

The most important relationship over the next 100 years will be the one between America (and its allies) and China. The stronger the allied nations, the better it is for America. But for America to get this essential relationship right, we need to have a clear-eyed view of our strategic economic and national security interests.

America is not operating from a position of weakness; indeed, our strengths are extraordinary. Conversely, over the next 40 years, China will have to grapple with some serious issues: For all of its strengths, China still needs more food, water and energy to support its population; pollution is rampant; corruption continues to be a problem; state-owned enterprises are often inefficient; corporate and government debt levels are growing rapidly; financial markets lack depth, transparency and adequate rule of law; income inequality remains highly prevalent; and its working age population has been declining since 2015. China will continue to face pressure from the United States and other Western governments over human rights, democracy and freedom in Hong Kong, and activity in the South China Sea and Taiwan.

Asia is a very tangled continent, geopolitically speaking. Many of China's neighbors (Afghanistan, India, Indonesia, Japan, Korea, Pakistan, the Philippines, Russia and Vietnam) are large, complicated and not always friendly to China — in fact, China has had border skirmishes and wars with India, the Soviet Union and Vietnam since World War II. These neighbors do not all look at the rise of China as being completely beneficial. By comparison, America is at peace with its North American neighbors and is protected by the Atlantic and Pacific oceans.

America and China have large differences: ideological, democracy versus single-party rule, and market capitalism versus state-controlled capitalism. We also have common interests: halting nuclear proliferation, reducing terrorism, stopping climate change and promoting peaceful relationships. All countries, including China, want to lift up their people. Done right, we can establish and maintain a relationship with China that will allow both countries and the world to thrive.

Because we are dealing with a combination of circumstances that we have never confronted before — the rise of a country equal in size to us, unfair trade and bilateral investment rights, and state-sponsored subsidies and competition — we will need to respond in equally unprecedented ways.

We should stop complaining about unfair practices and just take appropriate action. Both countries can take unilateral actions as they see fit in the economic domain — and they already do — and that is okay.

To counter unfair competition on China's part (i.e., subsidies and state-sponsored monopolies), we will need to develop thoughtful policies and strategies that work. We also need to develop "industrial policies" that help industries important to national security (for example, semiconductors, 5G, rare earths and others) succeed. I believe this could be done intelligently and not as "handouts" or subsidies that create excessive profits. This will also require increased government R&D focused on activities that business simply cannot do alone — advanced science, military technologies, among others.

Although there will be global trade restructuring, lots of global trade (and trade with China) will remain even after trade partnerships have been altered. Keep in mind, China's trade with the West and the United States in 2021 totaled $3.6 trillion (exports and imports). By contrast, China's total trade with Russia in 2021 totaled almost $150 billion. Clearly, these economic relationships are critical to China and the West — China also has a huge interest in making this work.

All of these policies must be done in conjunction with our allies or they will not be effective — because without a united front, unfair economic and trade practices will still be allowed to flourish. If it were up to me, I would rejoin the Trans-Pacific Partnership (TPP). We need to look at trade as only one part of strategic economic partnerships — and that's exactly what TPP did. There is a lot at stake, but there is no reason why serious, comprehensive, honest negotiations can't lead to good outcomes.

THERE ARE COMPELLING REASONS FOR GLOBAL TRADE RESTRUCTURING.

There is no question that supply chains need to be restructured for three different reasons:

- For any products or materials that are essential for national security (think rare earths, 5G and semiconductors), the U.S. supply chain must either be domestic or open only to completely friendly allies. We cannot and should not ever be reliant on processes that can and will be used against us, especially when we are most vulnerable.
- For similar national security reasons, activities (including investment activities) that help create a national security risk — i.e., sharing critical technology with potential adversaries — should be restricted.
- Companies will diversify their supply chains simply to be more resilient.

This restructuring will likely take place over time and does not need to be extraordinarily disruptive. There will be winners and losers — some of the main beneficiaries will be Brazil, Canada, Mexico and friendly Southeast Asian nations.

Along with reconfiguring our supply chains, we must create new trading systems with our allies. As mentioned above, my preference would be to rejoin the TPP — it is the best geostrategic and trade arrangement possible with allied nations.

WE CAN HAVE A PATH FORWARD FOR U.S. POLICY: AGREE ON WHAT WE WANT, THEN EXECUTE.

We need more real leaders — people who know how to get things done, who are capable and who can educate and explain to all citizens what we need and why. We need a renaissance of the American dream and American "can-do" exceptionalism.

Our leaders need to agree on what we want and then execute to get it done. At a minimum, we should all agree that we want:

- ***The world's most prosperous economy,*** which would also mean having the world's reserve currency. The strength and the importance of the U.S. dollar are predicated on the strength and openness of the U.S. economy, the rule of law and the free movement of capital.
- ***Regulations and policies that foster growth*** and accomplish stated goals but don't cripple business innovation and investment. Policies need to be consistent, reliable and constantly reviewed to reduce red tape and increase efficiency.
- ***A new strategic economic and competitive framework,*** devised in partnership with our allies (particularly as it relates to China), which includes trade and industrial policy, as previously discussed. This does need rebranding. Trade is only part of an economic relationship (there are investment rights, property rights, education, immigration rights and so on). We should always negotiate strategic economic agreements remembering that whether you emerge with a formal agreement or not, you likely have created a policy.
- ***A "Marshall Plan," as previously mentioned, to ensure energy security*** for us and our European allies, requiring us to secure proper energy supplies immediately for the next few years (which can be done while reducing CO_2 emissions and combatting climate change).

- ***The strongest military in the world — continually maintained,*** though used judiciously and in conjunction with our allies. The strength of the military needs to be matched by the strength of our diplomatic, development and intelligence agencies.
- ***A more equitable labor market*** that maximizes employment and values all jobs, effective and continuous job training for workers of all ages, and practices that better promote sharing the wealth — i.e., higher minimum wages, an increased Earned Income Tax Credit (EITC), broader healthcare coverage and other related policies.
- ***A strong America that respects all its citizens,*** helps the poor and disadvantaged, honors again the dignity of work, and demonstrates character and civility. And we all want well-functioning, healthy social safety nets.

The war in Ukraine and the growing competitiveness of China — including its growing military and strategic alliances across the globe — dictate that we move forward on our comprehensive needs. If we do not resolve our problems and restore effective long-term leadership, it is easy to envision darker days ahead in both the economic and geopolitical realms. But with great leadership, America, our allies and the rest of the world will enjoy a brighter future.

Learning from Other Countries' Successes – and Failures

It is always instructive to look around the world at policies and countries that work — and policies and countries that don't work. For example, you can find countries that have done a great job providing safety nets — without damaging labor — and building infrastructure efficiently without crippling regulations. A number of countries have succeeded in developing themselves, surprisingly often with minimal natural resources: Ireland, Israel, Singapore, South Korea and Sweden. Singapore has developed effective healthcare programs. Germany and Switzerland have created impressive work apprenticeship models, and Hong Kong has excelled at infrastructure. Another inspiring example is Ireland. After decades of sectarian strife and terrorism, Ireland is now a melting pot with a thriving economy due to good government policies.

Then there are the counterexamples, countries sometimes flush with natural resources — Argentina, Cuba and Venezuela. Rarely is the successful nation the socialist or autocratic one. And all of the negative cases are either socialist governments or governments hypothetically run in the name of the people. The successful nations, on the other hand, all are market-based economies of slightly different types with policies that grow their economy and share the nation's wealth. Sweden is a good example of a country that many consider socialist, but it is far from it. By most measures, Sweden is actually more of a market-based economy than the United States, and it has enormous wealth and extremely strong social safety nets.

Competitive Threat Redux

The growing competition to banks from each other, shadow banks, fintechs and large technology companies is intensifying and clearly contributing to the diminishing role of banks ***and*** public companies in the United States and the global financial system. Before we give an update on the structural shifts taking place, it would be good to address the question: How did banks perform during the recent COVID-19 crisis?

BANKS PERFORMED MAGNIFICENTLY DURING THE COVID-19 CRISIS.

Within days of realizing COVID-19 was a pandemic that would virtually close large parts of the world's economies, the U.S. government moved with unprecedented speed. Fortunately, most banks were part of the solution – unlike during the Great Recession when many banks were not. And fortunately, unlike during the Great Recession, the U.S. economy was actually in good shape going into the COVID-19 recession.

Yes, of course, it is true that large government actions dramatically helped individuals, companies (including banks) and the economy overall. But it is also true that banks performed magnificently during the COVID-19 crisis. They extended a huge amount of credit, waived fees and postponed debt repayment, and were at the forefront of delivering Paycheck Protection Program (PPP) loans to small businesses. And they did it the right way, protecting government money by trying to make legitimate loans to borrowers in need. By contrast, nonbanks were involved in instances of illegitimate PPP loans and Economic Injury Disaster Loan assistance, as well as stimulus money fraud, often at rates almost ***five times*** those of traditional banks. As for us:

- JPMorgan Chase was the #1 PPP lender – over the life of the program, we funded more than 400,000 loans totaling over $40 billion.
- Since March 13, 2020, we delayed payments due and refunded fees for more than 3.5 million customer accounts – refunding more than $250 million for nearly 2 million consumer deposit and lending accounts and offering delayed payments and forbearance on more than 2 million mortgage, auto and credit card accounts, representing approximately $90 billion in loans.
- In 2020, we raised capital and provided credit totaling $2.3 trillion for customers and businesses of all sizes, helping them meet payroll, avoid layoffs and fund operations during that first year of the pandemic crisis.
- In 2020, we committed $250 million in global business and philanthropic initiatives, with particular focus on the people and communities most vulnerable and hardest hit by the pandemic.
- In addition, JPMorgan Chase launched several ambitious flagship programs, including our $30 billion commitment to help close the racial wealth gap and drive economic inclusion, which is described in more detail within this letter.

While the U.S. government's actions were a benefit to the whole economy, including the banking industry, banks were more than able to weather the terrible financial storm while setting aside extensive reserves for potential future loan losses. Importantly, during this time, the Fed conducted two additional, severely adverse Comprehensive Capital Analysis and Review stress tests, which projected bank results under extreme unemployment, GDP loss, market disruption and a smaller government stimulus. The results showed that banks could withstand these extreme conditions while continuing to finance the economy.

Size of the Financial Sector/Industry

($ in trillions)

			2010	2021
Size of banks in the financial system	Total U.S. debt and equity market		$ 57.6	$ 136.4
	U.S. G-SIB market capitalization		$ 0.8	$ 1.5
	U.S. bank loans		$ 6.6	$ 10.9
	U.S. bank liquid assets[1]		$ 2.8	$ 8.6
	Total U.S. broker dealer inventories		$ 4.1	$ 4.5
Shadow banks	Hedge fund and private equity AUM[2]		$ 3.1	$ 9.7
	U.S. private equity backed companies (K)	1996	1.6	10.1
	U.S. publicly listed companies (K)[3]	7.3	4.2	4.8
	Total private direct credit[4]		$ 14.0	$ 20.4
Size of nonbank competitors	Google, Amazon, Facebook, Apple market capitalization[5]		$ 0.5	$ 6.9
	Payments market capitalization[6]		$ 0.1	$ 1.2
	Private and public fintech companies market capitalization[6]		NA	$ 1.2
	Cryptocurrency market capitalization		NA	$ 2.2
	U.S. neobanks – # of users (M)[7]		–	>50
	Global exchanges and financial data companies market capitalization		$ 0.2	$ 1.0
	Nonbank share of mortgage originations[8]	2000	9%	68%
	Nonbank share of leveraged lending	54%	82%	87%

Sources: FactSet, S&P Global Market Intelligence, Assets and Liabilities of Commercial Banks in the United States H.8 data, Financial Accounts of the United States Z.1 data, World Federation of Exchanges, Pitchbook, Preqin and CoinMarketCap

G-SIB = Global Systemically Important Banks
AUM = Assets under management
NA = Not applicable
K = Thousands
M = Millions

For footnoted information, refer to page 47 in this Annual Report.

I also have very little doubt that if the severely adverse scenario played out, JPMorgan Chase would perform far better than the stress test projections. One supporting data point: From March 5, 2020 to March 20, 2020, when the stock market fell 24% and the bond index spread gapped from 191 to 446 prior to major Fed intervention, our ***actual*** trading revenue was higher than normal as we actively made markets for our clients. By contrast, the ***hypothetical*** stress test had us losing a huge amount of money in market-making, based on the way it is calculated. While I understand why regulators stress test this way — they are essentially trying to ensure that banks survive the worst-case scenario — the methodology clearly does not result in an accurate forecast of how our company would perform under adverse circumstances.

THE ROLE OF BANKS IN THE GLOBAL FINANCIAL SYSTEM IS DIMINISHING.

Banks have advantages and disadvantages. Some of the advantages, including economies of scale, profitability and brand, may only diminish slowly. Unfortunately, it also seems likely that some of the disadvantages, such as uneven or costly regulation, may not diminish at all. Other disadvantages, like legacy systems, will diminish over time.

Regulations have consequences, both intended and unintended — but many regulations are crafted with little regard for their interplay with other policies and their cumulative effect. As a result, regulations often are disconnected from their likely outcomes. This is particularly true when trying to determine what products and services will remain inside the regulatory system as opposed to those likely to move outside of it.

Keep in mind that markets, not regulators, set capital requirements. If regulators set capital standards that are too high for banks to hold loans, then the markets will drive those loans outside of the banking system. There are also non-capital regulatory standards that can force activities out of the regulatory system, such as excessive reporting and social requirements, among others.

Banks around the world are already engaged in tough competition with each other. A quick review of the chart on page 27 shows the phenomenal size of nonbanks — from payments companies and fintechs to exchanges and Big Tech — that compete with traditional banks, but outside of the banking regulatory system, in providing certain financial services. And those don't include many others, such as Schwab, Fidelity or Vanguard — which also provide banking-type services. The data also doesn't show that last year alone, $130 billion was invested in fintech, allowing them to speed things up — and at scale.

The pace of change and the size of the competition are extraordinary, and activity is accelerating. Walmart, for good reason (over 200 million customers visit their stores each week) can use new digital technologies to efficiently bring banking-type services to their customers. Apple, already a strong presence in banking-type services with Apple Pay and the Apple Card, is actively extending services into other banking-type products, such as payment processing, credit risk assessment, person-to-person payment systems, merchant acquiring and buy-now-pay-later offers. The large tech companies, already 100% digital, have hundreds of millions of customers, enormous resources in data and proprietary systems — all of which give them an extraordinary competitive advantage.

Properly regulated banks are meant to protect and enhance the financial system. They are transparent with regulators, and they strive mightily to protect the system from terrorism financing and tax evasion as they implement know your customer (KYC) and anti-money laundering laws. They protect clients' assets and clients' money in movement. They also help customers — from protecting their data and minimizing fraud and cyber risk to providing financial education — and must abide by social requirements, such as the Community Reinvestment Act, which requires banks to extend their services into lower-income communities. Regulators need to figure out what they really want to achieve.

The chart on page 27 shows banks' decreasing role in the global economy, but a few examples will put it in stark contrast.

- Banks' size and market cap (U.S. global systemically important bank [G-SIB] market cap is $1.5 trillion) have dramatically diminished relative to their nonbank competitors.
- U.S. banks' broker-dealer inventories have barely kept pace with the large increase in total markets. Banks' dramatic decline in market-making ability relative to the size of the public markets is a factor in the periodic disruptions that occur in the public markets.
- U.S. banks' loans in an 11-year period have only grown 65% and now represent only 8% of total U.S. debt and equity markets, down from 11% in 2010.
- Conversely, U.S. banks' liquid assets are up more than 300% to $8.6 trillion, most of which is needed to meet liquidity requirements.
- Banks' share of mortgage originations has gone from 91% to 32%.
- Banks' share of the leveraged loan market has decreased over the last 20 years from 46% to 13%.
- Neobanks, now with over 50 million accounts, bypass the Durbin Amendment and so earn higher revenue per debit swipe — and they don't have to abide by certain other regulatory or social requirements.
- Other companies providing banking-type services have hundreds of millions of accounts that hold consumer money, process payments, access bank accounts and extensively use customer data.
- A sizable and growing portion of equity trading has moved off transparent exchanges to non-traditional trading firms, causing a loss of access to on-exchange liquidity for many market participants.

I can go on and on, but suffice it to say, we must be prepared for this trend to continue.

It seems unlikely to me that all the banks, shadow banks and fintech companies will thrive as they strive to take share from each other over the next decade. I would expect to see many mergers among America's 4,000+ banks — they need to do this, in some cases, to create more economies of scale to be able to compete. Other companies will try different strategies, including bank-fintech mergers or mergers just between fintechs. You should expect to see some winners and lots of casualties — it's just not possible for everyone to perform well.

POSSIBLY MORE IMPORTANT: THE ROLE OF PUBLIC COMPANIES IN THE GLOBAL FINANCIAL SYSTEM IS ALSO DIMINISHING.

In addition to banks' shrinking global role, you can see that the number of public companies, which should have grown substantially over the past decade, is remarkably reduced. Instead, U.S. public companies peaked in 1996 at 7,300 and now total 4,800. Conversely, the number of private U.S. companies backed by private equity companies has grown from 1,600 to 10,100 — a remarkable increase.

This migration is worthy of serious study. The reasons are complex and may include public market factors, such as onerous reporting requirements, higher litigation expenses, costly regulations, cookie-cutter board governance, less compensation flexibility, heightened public scrutiny and the relentless pressure of quarterly earnings.

It's incumbent upon us to figure out why so many companies and so much capital are being moved out of transparent public markets to less transparent private markets — and whether this is in the country's long-term interest. We do need to ask some questions: Do we want public companies? Are we okay with more and more of our capital markets being private and, therefore, less regulated? If I were a shareholder of a company, I would ask myself, do I really think that all the rules we impose on public companies actually make them better? Finally, we need to consider, is it a good thing that many investors won't have the opportunity to invest in these companies if and when they are private?

There are good and bad reasons why capital is going private. For example, private companies can raise money more easily now than in the past. Private companies' boards and management teams can focus primarily on the business, and private investors can be more patient with capital — they are not necessarily worried about short-term results.

We need to study this public market diminishment thoughtfully and deeply — particularly since more regulation is coming that will affect this trend. This is a good time to think through and create the outcomes we ***want*** — and not just let multiple, often well-meaning but uncoordinated legal, regulatory and policy decisions take us where we do not want to go.

MORE REGULATION IS COMING — 10 YEARS AFTER THE CRISIS, WE ARE STILL ROLLING OUT BASEL IV — AND WE NEED MORE THOUGHTFUL CALIBRATION OF THE RULES.

Basel IV seems likely to increase capital requirements for banks on credit, loans, trading books and operational risk, some of which is unnecessary. These risks are real, but they need to be properly and rationally calculated. For example, operational risk is real; it exists in all enterprises and is usually handled in the ordinary course of business. If all large companies had to hold capital for operational risk, following the standard set for banks, trillions of dollars of additional capital would be permanently held in idle funds. The question for all capital requirements is: How much is enough?

If done properly, bank regulations could be recalibrated, adding virtually no additional risk, to make it easier for banks to make loans, intermediate markets and finance the economy. When it comes to political debate about banking regulations, there is little truth to the notion that regulations have been "loosened" — at least in the context of large banks.

We should keep in mind the enormous unintended consequences that could result from any policy (e.g., regulations) not being properly thought through. Policy with no forethought — designed without a comprehensive plan or instigated out of anger or false morality — can have bad outcomes. A few examples will suffice:

- The U.S. government management of student lending has been a disaster. In the 11 years since they've taken over student lending, they have extended an additional $1 trillion in loans. Prior to the pandemic, $300 billion of these loans were either severely delinquent or not being paid. We are not against student lending, but the disciplined use of capital should be applied here, too. I generally agree with the position that for loans that should not have been made and where the borrower reaped no benefit, there should be some forgiveness. However, many loans were properly made and brought the benefit that was expected. Government should reform its policies to stop making loans that should never be made.
- Fannie Mae and Freddie Mac contributed to the crisis in the mortgage market. In the mad rush to improve home ownership levels, these government-guaranteed institutions played a major part (along with many others engaged in the mortgage markets), over decades, in loosening mortgage underwriting standards. Ultimately, this proved catastrophic, leading to nearly $1 trillion in mortgage losses. Conversely, since then, mortgage regulations' excessive tightening is not only pushing the mortgage market into the unregulated financial system but also making mortgages less available to mostly lower-income Americans.

Services for Consumers and Small Businesses

Account Access and Management

- Savings accounts
- Checking accounts
- Overdraft protection
- Paperless statements
- Account alerts
- Debit cards
- Direct deposit
- Credit cards
- Assistance from bankers
- 24/7 customer service
- 24/7 Chase Mobile® app support
- Digital wallets
- Banking on the go
- Mobile check deposits
- Access to 4,800 Chase branches
- Access to over 16,000 ATMs
- Cash withdrawals at non-Chase ATMs

Home and Auto

- Home loan prequalification
- Mortgage calculator
- Home value estimator
- Home refinancing resources
- Car buying guidance
- Auto financing prequalification
- Vehicle trade-in value

Moving Money

- Pay people through Zelle
- Bill payments
- Money transfers
- Checks
- Money orders
- Cashier's checks
- Same-day wire transfers

Financial Health

- Financial health and planning tips
- Spending summary
- Automatic saving tools
- Budgeting tools
- Credit score checks
- Financial education workshops
- Banking account access for kids

Wealth Management and Investing

- Guidance from financial advisors
- Online investing tools
- Self-directed investing accounts
- Online trading
- Investment checkups
- Market research

Security

- Debit and credit card fraud monitoring
- Fraud alerts
- Replacement debit cards
- Rushed replacement cards
- Zero Liability Protection on credit cards
- Account monitoring

Small Businesses

- Check monitoring for businesses
- Business budgeting
- Insights for businesses
- Employee deposit cards
- Educational content for businesses

Travel, Shopping and Entertainment

- Trip cancellation insurance
- Debit card currency exchanges
- Extended warranties on card purchases
- Deals on your favorite stuff
- Auto rental collision damage waiver
- Access to early ticket sales

HOW SHOULD WE ADDRESS OUR G-SIB CONUNDRUM?

The U.S. implementation of G-SIB requirements does not enable a level playing field — plain and simple. Not only have American rules made the G-SIB designation worse for American banks (if JPMorgan Chase could operate on the same basis as large European banks, our Tier 1 capital requirements would be reduced by $30 billion), but the rules have not been adjusted as the framework allows. G-SIB capital requirements were supposed to be modified to account for the increasing size of the global economy and the smaller size of banks in relation to that global economy — this simply has not happened. So JPMorgan Chase will be required to hold 2% more common equity Tier 1 capital as a consequence.

We have always said that the G-SIB calculation is nonsensical as it is not risk-based at all. It drives absurd behavior, such as favoring various acquisitions that may be imprudent but don't require G-SIB capital or encouraging very risky loans that require no more G-SIB capital than risk-free loans. Being a large, diversified company, with strong revenue and profit streams, is normally a source of strength in troubled times, but this is a negative in regard to G-SIB capital. Even though American banks are performing well today, these extra capital requirements we are required to meet will have long-term negative consequences.

This extra capital is a drag on our return on equity (ROE), effectively reducing whatever our ROE would be by approximately 15% (hypothetically, our 17% target should be 20%). As a result, the dilemma is this: Do we restrict our growth and our ability to serve our clients in order to reduce our capital requirements over time and seek a higher ROE or do we invest our capital to grow with our clients (and in many cases remain competitive) and accept a permanently lower ROE?

BANKS NEED TO ACKNOWLEDGE THE DRAMATICALLY CHANGING COMPETITIVE LANDSCAPE.

If banks want to compete in this new and increasingly competitive world, they need to acknowledge the truth of this new landscape and respond appropriately — sometimes it truly is change or die.

As they adopt new technologies like cloud, artificial intelligence (AI) and digital platforms, banks may have an advantage in being able to leverage their large customer base to offer increasingly comprehensive products and services, often at no additional cost. While many fintech companies specialize in one area, you already see many fintechs moving in this direction — trying to deepen and broaden their client relationships.

The chart on the preceding page shows the extensive number of services we already offer to our customers — many of which, depending on the product and customer relationship, are at no additional cost.

We have always invested for the future, and that is even more true today than it has been in the past. But the principle is the same — constantly invest and innovate to ensure our future prosperity.

Investments and Acquisitions: Determining the Best Use of Capital and Assessing ROIs

We have always said that a steady and increasing dividend along with reinvestment in one's own business — organically and inorganically, offensively and defensively — are the highest and best use of capital. Reinvestment would ordinarily come before stock buybacks unless the stock is extraordinarily cheap. And we generally only buy back stock when we don't see a clear need for the capital over the next few years.

In fact, stock buybacks at our company will be lower in the next year or so because we may need to retain more capital due to required capital increases (which, by any real measure, we definitely do not need) and because we have made some good acquisitions that we believe will enhance the future of our company.

We try to be rigorous in how we invest for the future. Above all, we try to free up our capital and capabilities with the following in mind: 1) we reduce complexity in our company and simplify as much as possible; 2) we periodically assess and eliminate hobbies (which have a danger all their own); and 3) we assess investments and activities that seemed good when we started them but are not working out as planned. However, some things simply are complex (like airplanes, pharmaceuticals, technology and banking) but worthwhile — and in fact necessary to compete. We don't let fear of that complexity stop us from investing.

Before we talk about different types of investments, we should recognize that our most important asset — far more important than capital — is the quality of our people.

We announced earlier in the year that our total expenses would increase by approximately $6 billion. Of that amount, $2.5 billion is mostly related to people, reflecting both inflationary and competitive labor market dynamics. (We have been quite adamant that we will do what is necessary to retain talent — we cannot be one of the best companies without having some of the best talent.) Included in this $2.5 billion are certain expenses (think travel and entertainment) as economies have reopened.

In this section of the letter, I am going to focus on investments — describing how and why we do them and offering a few examples. We have always believed that investing continuously and rigorously for the future is critical for our ongoing success. This year, we announced that the expenses related to investments would increase from $11.5 billion to $15 billion. I am going to try to describe the "incremental investments" of $3.5 billion, though I can't review them all (and for competitive reasons I wouldn't). But we hope a few examples will give you comfort in our decision-making process.

SOME INVESTMENTS GENERATE PREDICTABLE RETURNS.

Some investments have a fairly predictable time to cash flow positive and a good and predictable return on investment (ROI) however you measure it. These investments include branches and bankers, around the world, across all our businesses. They also include certain marketing expenses, which have a known and quantifiable return. This category combined will add $1 billion to our expenses in 2022.

Our shareholders should also know that when we make investments like these, we incorporate through-the-cycle thinking — we don't only look at current margins and charge-offs but also evaluate what we expect them to be over the next several years.

ACQUISITIONS SHOULD PAY FOR THEMSELVES — AND EACH ONE HAS ITS OWN LOGIC.

Acquisitions generally extend products, add services or bring in technology that we would have had to otherwise build ourselves. These acquisitions are described in more detail in the letters from the other CEOs included in this report. Over the last 18 months, we spent nearly $5 billion on acquisitions, which will increase "incremental investment" expenses by approximately $700 million in 2022.

We expect most of these acquisitions to produce positive returns and strong earnings within a few years, fully justifying their cost. In a few cases, these acquisitions earn money — plus, we believe, help stave off erosion in other parts of our business. Importantly, on an ongoing basis, many of our acquisitions will be relatively capital-lite, meaning they can grow over time but require little additional regulatory capital.

WE WANT TO BUILD UPON OUR GLOBAL FOOTPRINT.

While we don't disclose our investment here, our international consumer expansion is an investment of a different nature. We believe the digital world gives us an opportunity to build a consumer bank outside the United States that, over time, can become very competitive — an option that does not exist in the physical world. We start with several advantages that we believe will get stronger over time: a global brand, with long-term capital and staying power; a global Payments business; an international Private Bank; global Asset Management products; and best-in-class trading platforms. We have the talent and know-how to deliver these through cutting-edge technology, allowing us to harness the full range of these capabilities from all our businesses. We can apply what we have learned in our leading U.S. franchise and vice versa. We may be wrong on this one, but I like our hand.

WE MAKE EXTENSIVE INVESTMENTS IN TECHNOLOGY FOR A BROAD RANGE OF REASONS, FROM IMPROVING OPERATIONS AND SECURITY TO ENHANCING OUR PRODUCTS AND SERVICES.

Investments in technology and operations, as well as related products and services, are the most complicated category. Some of these investments simply must be done to sustain the company's health. Investments in this bucket help keep the ship in tip-top shape and touch a broad range of workplace needs: regulatory requirements and necessary improvements for cybersecurity, as well as operational resiliency and security. Some things we have done with no direct revenue benefit, rather simply to maintain our competitive position. I call these table stakes — think of digital account opening for consumer and small business accounts. Other investments are specific improvements to products and services, often with identifiable benefits. Finally, there are specific investments in this category that are more like forward-looking R&D, as described in the examples that follow.

Combined, this category will add a little bit less than $2 billion to our "incremental investment" expenses in 2022 (the actual expense lines could be for people, hardware or software, or purchased services). Almost all of the $2 billion in expenses are analyzed and studied for their ROI or other significant benefits.

Sometimes people refer to some of these expenses as modernizing or adopting new technologies. I prefer not to talk about it that way because, effectively, we have been modernizing my entire life. Also, the term implies that once you get to a modern platform, these expenses should dramatically decrease — which is rarely the case. In fact, when we analyze these expenses, we incorporate not only the cost to ***build*** the product or service but also the cost to maintain it going forward. Furthermore, once you have built the new platforms, they generally create a whole new set of investment opportunities to be analyzed. Technology always drives change, but now the waves of technological innovation come in faster and faster. The science behind them is also increasingly complex as technology (including AI) is "embedded" in more products. In today's world, I cannot overemphasize the importance of implementing new technology.

We hope a few examples will explain how these expenses are managed. To do so, we are going to talk about two different types of investments that are clearly related: infrastructure and software.

First, on the path to new and modern infrastructure, cloud-based systems, whether private or public, will ultimately be faster, cheaper, more flexible and also AI-enabled — all extremely valuable features. A few other additional details:

- We have spent $2.2 billion building new, cloud-based data centers. Our total expensed cost of data centers is higher than in previous years — mostly because of the duplicative expense that is generated as we run both the new and older centers.
- Thousands of applications (and their related databases) are being replatformed and refactored to run in the private and public cloud environment. To give you an example: We migrated our Card mainframe to the new data center and are already seeing approximately 20% faster response times for our major customer-facing applications. This one application will use only 1.5% of the capacity of our new data centers: Of our more than 5,000 applications that will still be in use in two years, 40% will have been replatformed.
- These "infrastructure" costs include things like modernizing developer tools and embedding operational resiliency and cybersecurity controls.

Second, much of our "incremental investment" technology spend involves building software for new products and services. There are hundreds of these, large and small. Again, a few examples will describe the process:

- In certain product areas, we made large, multi-year investments to improve a specific business. In Payments, we have been investing consistently over the past five years to modernize our businesses and compete with both banks and fintech companies. Since 2016, we have invested more than $1.5 billion in technology, operations, sales, products and controls and generated an incremental $4 billion in organic revenue annually, taking our overall market share in Treasury Services from 4.5% in 2016 to 7.2% in 2021. In 2021, we continued this strong momentum, initiating a large majority of all real-time payments in the United States in our cloud-native, faster payments platform, which is now live in 45 countries. We are also winning more than 80% of all global bids that include virtual account solutions available on our liquidity platform.

  We now process payments for eight of the top 10 global Big Tech companies (up from three out of 10 companies five years ago), consistently winning business from strong competitors. We continue to bring to the market and commercialize innovative products, such as embedded banking; AI-driven fraud controls and forecasting; and account validation and programmable payments on JPM Coin. Decentralized finance and blockchain are real, new technologies that can be deployed in both public and private fashion, permissioned or not. JPMorgan Chase is at the forefront of this innovation. We use a blockchain network called Liink to enable banks to share complex information, and we also use a blockchain to move tokenized U.S. dollar deposits with JPM Coin. We believe there are many uses where a blockchain can replace or improve contracts, data ownership and other enhancements; for some purposes, however, it is currently too expensive or too slow to be deployed.

We expect to achieve double-digit market share over time in Payments, being the world's most innovative bank, as well as the safest and most resilient.

- We built the capability for our Self-Directed Investing, which now has 800,000 new investment accounts totaling nearly $60 billion on the platform. We are excited to enhance and roll out this product to all of our customers, as we think it is a critical offering in today's new competitive environment.
- Increasingly, we are investing more money (think hundreds of millions of dollars) each year on AI for very specific purposes. For example, we use AI to generate insights on existing and prospective clients from public information, such as KYC protocols, regulatory filings, social media, news, public websites and documents. Once standardized, the information is then applied to multiple uses, such as generating leads, identifying companies and investors, onboarding clients, and detecting environmental, social and governance (ESG) themes. In all of these cases, there are identifiable returns due to lower prospecting costs or improved services. One specific example will suffice:
  - In the consumer world, we have spent about $100 million since 2017 on AI, machine learning and other technology initiatives to improve fraud risk systems. We know this investment is working. Our annual fraud losses have come down 14% since 2017 despite volumes being up almost 50%, and we estimate that our technology investments alone have contributed about $100 million in annual savings.
- We have developed over 1,000 application programming interfaces that give various types of customers access to our systems in a controlled way, allowing them to automate our banking systems into their enterprise systems.
- There are plenty of forward-looking and exciting R&D investments, too. For example, we are working on several research-based projects that have the potential for significant future impact. These involve multi-agent simulation, synthetic data and encryption methods — elements that have the capacity to unlock new ways of trading, managing risk and assessing productivity. Multi-agent simulations, for example, enable the exploration of strategies that can handle challenging regimes as variations of novel historical data. Synthetic data, well-calibrated by real data, enables effective testing, experimentation and development without triggering privacy and regulatory restrictions associated with using real data. Encryption methods give us better tools to protect our clients' privacy and also equip us with the necessary techniques to handle the metaverse. This category also includes investment in the critical area of quantum computing.

While we measure each of these incremental investments (and there are hundreds of them) as diligently as we can, you can assess the overall results by asking the following questions: Do we maintain the competitiveness of our products? Are we gaining market share? Do we have real wins against some tough competitors, both in the banking world and in fintech companies? What are our customer satisfaction scores? Have we built wonderful new products, like Credit Journey and Self-Directed Investing, that may not generate revenue but clearly have improved our business? How are our products serving our clients' needs to access our systems how and when they want?

Finally, also consider: Is the bank sustaining its overall competitive position, growing at pace and still maintaining a very healthy return on tangible common equity while investing for the future? We hope you will see some great new and exciting products and services this year.

Updates on Specific Issues Facing Our Company

WE ARE VIGILANT AGAINST CYBER ATTACKS.

As we have highlighted in previous letters, ***we cannot overemphasize*** how cyber threats pose extreme hazards to our company and our country. This has become even more evident as the cost of ransomware has increased dramatically (cyber attacks may have caused the death of some people as hospitals could not provide the necessary procedures). And it is evident to everyone, with the war in Ukraine, that grave damage could be inflicted if cyber is widely used as a tool of war. We believe that our company has some of the best cyber protections in place, as well as the best talent to monitor and guard our information. We also work extensively, and increasingly, with the appropriate agencies of the U.S. government to help protect the financial system and the country.

OUR COMMITMENT TO SUSTAINABILITY IS INFORMED BY ENERGY REALITIES.

Despite the growth in well-intended climate pledges from governments and companies, the world is well short of meeting its net zero emissions goals by 2050. But the war in Ukraine and sanctions on Russia are driving gasoline prices up and threatening Europe's access to natural gas. Resource scarcity leads to higher energy costs and reduces reliability, hindering national security and hurting the most vulnerable. Disruptions to the global energy system are again highlighting our urgent global need to provide energy resources ***securely, reliably and affordably*** and, at the same time, address long-term clean energy solutions and strategies to reduce our carbon footprint.

These objectives are ***not mutually exclusive***. We can — and must — do both.

To begin, we need to find a better way forward that can bring diverse stakeholders together in pursuit of the North Star: another "Marshall Plan" (as described earlier). Here are four ways to jump-start that process:

- First, we must promote energy security. Constraining the flow of capital needed to produce and move fuels, especially as the war in Ukraine rages on, is a bad idea. The world still needs oil and natural gas today, but not all hydrocarbons are equal when it comes to their carbon footprint. We should be directing more capital toward less carbon-intensive fuel sources and investing in innovations, such as carbon capture and sequestration, as we look to transition to green technologies delivered at scale for society. Our company is firmly committed to helping finance these kinds of investments and expediting the use of lower-carbon fuels. This is why we established the Center for Carbon Transition, centralizing client access to financing, advisory and research solutions to help them make the low-carbon transition and thrive.
- Second, we need to scale investment massively in clean technologies. As the International Energy Agency has emphasized, "huge leaps in clean energy innovation" are core to achieving net zero. This is because the world will rely on traditional fuels until alternatives, like clean hydrogen, are fully available. To accelerate progress, JPMorgan Chase has a goal of financing and facilitating $1 trillion by 2030 to advance climate action — supporting initiatives such as renewable energy, green buildings and vehicle electrification.
- Third, governments should play a leadership role by enacting thoughtful policies that spur long-term and large-scale capital deployment for low-carbon solutions that create jobs and benefit the global economy. Here are some examples: a carbon tax that directs some proceeds to help offset energy costs for under-

served communities; measures to promote investment in technology R&D; and reductions in permitting timelines for energy infrastructure, such as wind and solar farms and liquefied natural gas.

- Finally, let's set meaningful goals and identify a few tangible, cost-effective solutions to reduce emissions today. This should include minimizing fugitive methane emissions and virtually eliminating wasteful flaring of natural gas. Immediately actionable opportunities like these might require ***more financing***, not less, to reduce the short-term rate of climate change and prepare companies to thrive in a lower-carbon future. In 2021, JPMorgan Chase set 2030 targets to reduce the carbon intensity of our financing portfolio, starting with oil and gas, electric power and automotive manufacturing — with more to come.

There is no silver bullet to meet the world's energy and climate goals. But we can start by prioritizing emissions reductions, developing meaningful short- and long-term goals and crafting innovative policy solutions. The curve toward net zero can still be bent before it's too late.

PROGRESS CONTINUES IN OUR DIVERSITY, EQUITY AND INCLUSION EFFORTS.

We've made tremendous progress over the past few years to create a more inclusive company and promote equity in all our communities. The work is not easy, but we are as committed as ever to doing what is right and just. I'll spotlight a few areas of focus and describe the progress we've made.

A More Diverse Workforce

We continue to believe that if our team is more diverse, we will generate better ideas and better outcomes, enjoy a stronger corporate culture and outperform our competitors. This appears to be proving true.

Despite the pandemic and talent retention challenges, we continue to boost our representation among women and people of color. Here are some examples:

- More women were promoted to the position of managing director in 2021 than ever before; similarly, a record number of women were promoted to executive director. By year's end, based on employees who self-identified, women represented 49% of the firm's total workforce. Overall Hispanic representation was 20%, Asian representation grew to 17% and Black representation increased to 14%.
- We expanded our global Diversity, Equity and Inclusion department to include three new Centers of Excellence: Advancing Hispanics and Latinos, The Office of Asian and Pacific Islander Affairs, and The Office of LGBT+ Affairs.
- To promote greater participation in our workforce by Black professionals, we expanded our Historically Black Colleges and Universities partnerships to ***17 schools*** across the United States to boost recruitment connections, expand student career pathways, and support long-term student development and financial health.
- We continue to find ways to lift our LGBT+ employees, professionals with disabilities and military veteran colleagues. We just celebrated the 10th anniversary of the Veteran Jobs Mission, which is a coalition JPMorgan Chase co-founded in 2011 as the 100,000 Jobs Mission. It began as 11 companies committed to hiring military talent across the private sector, and now membership exceeds 300 companies with more than 830,000 veterans hired.

Finally, I want to be clear: We oppose any and all forms of discrimination against anyone. Being the bank of choice for all is our goal — and we want everyone to feel welcome here and be able to contribute to our core mission to the best of their ability.

An Update on Our $30 Billion Racial Equity Commitment

The murder of George Floyd in 2020 highlighted what we already knew: More was required by all of us to address systemic racism. In October 2020, less than five months after his tragic murder, our company made a five-year, $30 billion commitment to help close the racial wealth gap. We committed to trying new things and putting the full force of our firm behind solutions that could really make an impact.

By the end of 2021, we had deployed or committed more than $18 billion toward our goal. That commitment focuses on increasing homeownership, expanding affordable rental housing and growing small businesses, spending more with Black, Hispanic and Latino suppliers, improving financial health and access to banking, investing in minority depository institutions (MDI) and community development financial institutions (CDFI), and investing in communities through philanthropic capital. Here are some details on our progress to date:

- Supplier Diversity: In 2021, we spent an additional $155 million with 140 Black, Hispanic and Latino suppliers — more than doubling the first-year spend goal and increasing the number of new Black, Hispanic and Latino suppliers by more than 40% over 2020.
- Affordable Rental Housing: We approved funding of approximately $13 billion in loans to create and preserve more than 100,000 affordable housing and rental units across the United States.
- Homeownership: We established a Community and Affordable Home Lending business, hiring over 150 Community Home Lending Advisors and expanding the Chase Homebuyer Grant to $5,000 to help cover customers' closing costs and down payments for homes purchased in 6,700 minority neighborhoods nationwide.
- Small Business: We hired 25 diverse senior business consultants to provide free one-on-one coaching for minority business owners in 14 U.S. cities and to mentor more than 1,000 small businesses.
- MDIs: We invested more than $100 million in equity in 16 diverse financial institutions that serve nearly 90 communities in 19 states and the District of Columbia.
- CDFIs: We provided more than $190 million in incremental financing to CDFIs to support communities that lack access to traditional financing.
- Access to Banking: We helped more than 200,000 customers open low-cost checking accounts with no overdraft fees; opened 10 Community Center branches (the sidebar that follows includes more details about this initiative), often in areas with larger Black, Hispanic and Latino populations; and hired over 100 Community Managers in underserved communities to build relationships with community leaders, nonprofits and small businesses.

Our dedication to racial equity is not simply a five-year effort. We might not always get it right, but we are committed to advancing racial equity and sharing our progress on the journey.

Community Building through Community Banking

Americans have lost trust in the ability of large institutions like the federal government, national media and big companies — even big banks — to understand or care about their needs. This view is well earned, particularly among communities of color and low-income households. Simply put, our country has done a bad job of looking out for and creating opportunity for everyone. We need to consider more thoughtfully the unique needs of communities across the United States. Companies of all sizes need to show up, listen, and make the right investments and decisions to earn a neighborhood's trust. And it needs to be done on the ground and in the community itself to be authentic and sustainable. Impact is most effective when it is local.

A local bank branch, especially in a low-income neighborhood, can be successful only when it fits the community's needs. That is why over the last several years we have shifted our approach to how we offer access to financial health education, as well as low-cost products and services, to help build wealth, especially in Black, Hispanic and Latino communities. We are delivering this approach through our ***Community Center branches,*** unique spaces in the heart of urban communities. Beginning with Harlem in New York City and Ventura Village in Minneapolis, we have opened 10 more Community Center branches in neighborhoods like Stony Island in the South Shore of Chicago, Crenshaw in Los Angeles, and Wards 7 and 8 in Washington, D.C. Ten of these branches were opened since we announced our $30 billion commitment to racial equity in October 2020. These branches have more space to host grassroots community events, small business mentoring sessions and financial health seminars. The majority were ***built with minority contractors,*** and we hire local artists to make these locations complement their neighborhoods. With branches expanding to Atlanta, Baltimore, Miami, Philadelphia and Tulsa, we expect to have 17 Community Center branches serving customers in underserved communities by the end of 2022.

The ***Community Manager,*** a new role within the bank, primarily functions as a local ambassador to build and nurture relationships with community leaders, nonprofit partners and small businesses. We have now hired over 100 Community Managers in underserved communities and intend to keep growing that number. Our Community Managers have hosted more than 1,300 financial health events with over 36,000 people in attendance and have participated in 600+ community service events. We want people who live and work in these communities to feel welcome and included when they visit our branches. We ask them to come as they are and bring the family or their dog. They are also likely to know the employees in the branch, as we ***hire locally*** — people who live in the community and care about serving their neighbors.

I've attended many grand openings of our Community Center branches in person. The energy is contagious. We've hosted mayors, community partners, students and small business customers who have shared their sense of pride and optimism about what these branches mean for their community. Our Community Managers are always front and center at these events, connecting people to one another and forging new relationships.

We know that to be sustainable, this effort must be measured by results. Our company is closely tracking the number of accounts opened, the number of mortgages funded, the pace and scale of new small business loans extended, and a host of other metrics to ensure that we are achieving results and listening to feedback so we can have even greater impact. In October 2021, we published a detailed report on our racial equity initiatives, including our Community Center branches and Community Managers, which we intend to continue to provide, letting others learn from our experience.

We're also taking a local approach to our community investments and advocating for local policy solutions. Our business is only as strong as our communities, so we increased our investments in places like Mattapan in Boston and Oak Cliff in Dallas to help local minority small businesses access the capital and support they need to grow. We've expanded our homebuyer grant program, which provides $5,000 to cover closing costs and down payments when customers buy homes in 6,700 minority neighborhoods nationwide. We are also looking at ***alternative credit scores*** and other ways to increase homeownership in underserved communities and build generational wealth and stability.

We call this going from "community banking" to "community building," and it is an important evolution in serving communities where it is long overdue. While it is early, our approach has the promise to create real local impact.

MORGAN HEALTH IS HELPING US LEAD IN HEALTHCARE TRANSFORMATION.

JPMorgan Chase spends $39 billion on compensation and benefits for our 270,000+ employees. Of that amount, about $1.5 billion is directed to medical costs for our employees and their families — approximately 460,000 people. Our employees also spend approximately $500 million on their own medical care. Medical care costs may be our most important benefit costs because they have a critical impact on the health and well-being of our employees and their families. As our employees remain our most valuable asset, improving the quality and delivery of healthcare services is a high priority.

Managing the complexities of healthcare is staggering, whether you are an individual or a corporation — from coping with actual health issues (covering the spectrum of a bad back to diabetes to cancer) and locating suitable primary or specialist care to deciphering incomprehensible insurance plans and pricing, resolving excessive surprise bills and other issues. While the U.S. healthcare system is exceptional in many ways, it also has many flaws that must be addressed. Healthcare costs, which are already the highest in the world, continue to rise (average premiums for family coverage have increased 22% since 2016) for both employers and employees — with no evidence that outcomes are improving (e.g., only 46.5% of adults with private insurance have their blood pressure controlled, and that number has declined in the last 10 years).

This is why, in 2021, we launched Morgan Health, a new business unit. With Morgan Health, we have an opportunity to deliver and scale new healthcare models that improve the quality, equity and affordability of employer-sponsored healthcare. We're focused on connecting healthcare to improved health outcomes for our employees. JPMorgan Chase has approximately 20 talented people on our Human Resources Benefits team helping employees and their families access the best possible medical care. In hindsight, it is shocking how few people we had dedicated to this vitally important issue. With Morgan Health, we are adding approximately 30 more individuals who will help our Benefits team attack this problem from many different angles.

Looking forward, Morgan Health is investing $250 million to accelerate the development and delivery of accountable care (managing a patient's total care from prevention to outcomes), completing its first $50 million investment in Vera Whole Health — and its subsequent investment in Castlight — with plans to deploy these services to our employees in Columbus, Ohio, this year. Morgan Health just completed another investment in healthcare analytics company Embold Health, which will help facilitate how consumers access the highest-quality care available. We are also working toward providing equal access to equal healthcare, regardless of race, income or other personal characteristics for our employees and in the communities we serve. Addressing inequities in healthcare is fundamental to Morgan Health's strategy, and our partnership with Kaiser Permanente in California is moving forward quickly on its collaborative effort focused on the collection and reporting of health equity performance metrics.

WE CONTINUE TO SUPPORT DATA-DRIVEN POLICYMAKING THROUGH THE JPMORGAN CHASE *POLICY*CENTER AND INSTITUTE.

Last year, I wrote that one lesson of leadership is putting in place good decision-making processes. An essential part of that is good data because the challenges we face are complex and interconnected. Too often, decision makers use "facts" to justify a pre-existing point of view or do not accurately represent reality. Good data that is granular and timely and, when possible, leverages big data sources must be at the heart of all policy processes to ensure measurable and equitable outcomes.

Six years ago, we created the JPMorgan Chase Institute to deliver unique data and insights to help solve some of our most pressing economic challenges. This information offers a unique lens into the financial habits of millions of small businesses and households, leveraging anonymized and aggregated customer data that represents half of U.S. households. The Institute's data and analyses have helped policymakers better understand the impact of decisions — ranging from student loan relief and targeted investments in underserved Chicago and Detroit neighborhoods to small business support and insights about how families manage income volatility and use their tax refunds. Importantly, the Institute has also helped shape some of our own products and employee benefits, including how we incentivize customers to save more money and reduce health insurance deductibles for our lower-paid employees.

The Institute's work has also helped inform our policy advocacy efforts that support inclusive growth. Two years ago, we launched the JPMorgan Chase *Policy*Center to drive this work. Grounded in data, we are developing and advocating for policy aimed at reducing structural barriers to economic mobility and broadening opportunity for millions of families who live on the financial margins and have been most impacted by COVID-19. For example, as Congress was debating expanded unemployment benefits, our research showed how these benefits had boosted spending and stimulated economic activity during COVID-19. Additional research has provided insight into household balances, cutting across income levels and providing an important barometer on how households are faring as government support expires.

This work is not easy, but we believe it's imperative that policymaking include private and public sector partnership. We continue to need better data to understand what is happening in the real economy so we can help shape policies that make a significant and positive impact on those who need help the most.

WE JOIN OTHER COMPANIES IN EVOLVING OUR VISION OF THE WORKPLACE.

Today, in many places COVID-19 has moved from pandemic to endemic status, although there is still suffering in some parts of the world. And we are cognizant that the risk of new variants is real and that if they occur, we will need to take appropriate action.

As a company, while we continually prepare for multiple business resiliency scenarios (e.g., data center failures, closures of cities, major storms, even widespread disease), we never fully prepared for a pandemic that entailed a large-scale shutdown of the global economy. Although some of our employees, particularly in the branches, continued to work on our premises every day, we quickly set up the technology — ranging from call centers and operations to trading and investment banking — that enabled many of our employees to work from home. We learned that we could function virtually with Zoom and Cisco and maintain productivity, at least in the short run.

Although the pandemic changed the way we work in many ways, for the most part it only accelerated ongoing trends. While it's clear that working from home will become more permanent in American business, such arrangements also need to work for both the company and its clients. I believe our firm's on-site versus remote work will sort out something like this:

- Generally speaking, many employees (approximately 50%) will necessarily work at a location full time. That would include nearly all employees in our retail bank branches, as well as jobs in check processing, vaults, sales and trading, critical operations functions and facilities, amenities, security, medical and many others.
- Some employees (approximately 40%) will work under a hybrid model (e.g., some days on-site and other days at home). Increased flexibility and hybrid working arrangements will vary by job type. We do hope to provide these types of arrangements where they are appropriate and for those who want them.

- A small percentage of employees, possibly 10%, may work full time from home in very specific roles.

In all situations, these decisions depend upon what is optimal for our company and our clients, and we will extensively monitor and analyze outcomes to ensure this is the case. As we reopen, and we mostly are, we will, of course, follow government guidelines.

Remote work will change how we manage our real estate. We will quickly move to a more "open seating" arrangement in which digital tools will help manage seating arrangements (people will have regular neighborhoods where they can congregate), as well as needed amenities, such as conference room space. As a result, for every 100 employees, we may need seats for approximately 60 to 75 on average — with an appropriate increase in conference room, private office and amenity space to make it a great work environment.

The virtual world also presents some serious weaknesses. For example:

- Performing jobs remotely is more successful when people know one another and already have a large body of existing work to do. It does not work as well when people don't know each other.

- Most professionals learn their job through an apprenticeship model, which is almost impossible to replicate in the Zoom world. Since the onset of COVID-19, JPMorgan Chase has hired over 80,000 new people into the company — and we are making sure they are properly trained on all aspects of our business, from their special role to the significance of conduct and culture. But this is harder to do over Zoom. Over time, this drawback could dramatically undermine the character and culture you want to promote in your company.

- A heavy reliance on Zoom meetings actually slows down decision making because there is less immediate follow-up.

- Remote work eliminates much spontaneous learning and creativity because you don't run into people at the coffee machine, talk with clients in unplanned scenarios or travel to meet with customers and employees for feedback on your products and services.

- Finally, the negative effects of the weaknesses outlined above are cumulative — they weren't as obvious earlier in the pandemic — and they get worse over time.

We are moving full steam ahead with building our new headquarters in New York City. We will, of course, consolidate even more employees into this building, which will house between 12,000 and 14,000 people. We are extremely excited about the building's public spaces, state-of-the-art technology, and health and wellness amenities, among many other features. It's in the best location in one of the world's greatest cities.

Two final points. Of our total overhead of $71 billion, $39 billion represents our people costs. Over time, using lots of data, surveys and other metrics, we believe we can gain efficiencies while still keeping our people happy, healthy and motivated, at an increasingly lower cost.

And finally, our leaders must lead. They have to walk the floors, they must see clients, they need to be visible, they need to teach and educate, and they need to be able to conduct impromptu meetings. They cannot lead from behind a desk or in front of a screen.

Management Lesson: The Benefit of Purpose and the Tremendous Value of Work

Great management and leadership are critical to any large organization's long-term success, whether it is a company or a country. Strong management is disciplined and rigorous. Facts, analysis, detail … facts, analysis, detail … repeat. You can never do enough, and it does not end. But creating an exceptional management team is an art, not a science.

In the section on Investments, I described what we consider our ***most important investment*****:** our people, who in accounting terms are not even considered an asset. But we all understand the value of building a great team.

In the rest of this section, I talk about some management lessons — I always enjoy sharing what I have learned over time by watching others and through my own successes and failures.

PERFECT YOUR PICASSO — HAVE SOMETHING TO STRIVE FOR AND MOTIVATE YOU.

It seems to me that people are happier and more motivated when they have a passion, a moral purpose, something they are devoted to — when they are painting their own Picasso, striving for something. Some people find it in religion, the military, teaching, science, athletics, parenthood, entrepreneurship or simply being their best at their craft. Whatever it is, all these things combined — when done well — create a wonderful society. And most people I know get an enormous sense of satisfaction from the exploration and learning that take place on the journey.

Personally and professionally, I am motivated by the desire to leave the world a better place — if I do my job well, this company can do so much for individuals, shareholders, communities, countries and humanity. I am motivated when I see our customers and employees in action, knowing there is increased opportunity for each of them when we do better as a company. I am motivated when I go to our annual National Achievers Conference, which recognizes some of our most successful bankers and managers in the branches. Sometimes they have tears in their eyes as they accept this recognition — many have never been recognized before — and it is hard to describe how this deepens my own sense of responsibility.

RECOGNIZE THE TREMENDOUS VALUE OF WORK.

Work, all work, has value. It was a beautiful thing during the onset of COVID-19 when we celebrated our essential workers (in New York City, it was unbelievable to hear the sound of 1 million New Yorkers shouting thanks out their windows every evening at 7:00), including nurses, firefighters, emergency medical service staff, sanitation workers and police officers (although recently that spirit seems to have waned). They were ***always*** essential workers, and they appreciated our recognition.

Along the same lines, some in society diminish "starter" jobs, such as cashiers, office workers, bank tellers, fast food cooks and others. These "starter" jobs bring dignity, provide security for many families and create a solid work ethic. Often, they result in better social outcomes in terms of reductions in drug use and crime, similar to outcomes we have seen from summer youth employment. For many, these jobs are the first rung on the career ladder, leading to bigger and bigger jobs. For example, more than 95% of Domino's franchise owners started as delivery drivers or pizza makers. At JPMorgan Chase, about one-third of our branch managers started as tellers or personal bankers.

I have expressed regret for many years in this letter that we, as a society, have not found a way to better prepare our young people for jobs, whether through conventional schooling or apprenticeships and skills-based training, which is more important today than ever before. Offering better training and getting more income to lower-paid workers would hugely benefit the economy, the individuals involved and social outcomes – and would help rectify income inequality. We must do a better job improving the outcomes of an education; i.e., that it leads to well-paying jobs. I also believe that we should immediately increase the minimum wage and the EITC to both entice more people into the workforce and to get more income into the hands of the lower paid.

NURTURE THE EXTRAORDINARY VALUE OF TRUST.

Trust is earned, given and received. To maximize human creativity and freedoms – which are the greatest gifts of capitalism – trust is essential. We must make it safe to argue, disagree and challenge each other while continuing to dig deeper in areas where we're not doing as well as we'd like. It must be okay to fail or make mistakes. Trust is the force multiplier that gets the best out of everyone. You do not earn trust if you finger-point, don't admit to your own mistakes or don't share the credit.

COMBAT THE ENEMY WITHIN.

While trust is the force multiplier, a workplace cannot devolve into excessive, feel-good collaboration and bureaucracy. I have seen work environments in which everyone is so nice to each other and so collaborative that it slowly creates crippling bureaucracy as everyone's opinion is sought out – and everyone has a veto.

The other disease that arises from within is a workplace completely run by corporate headquarters: It is very easy to be critical of people in the field for their failures when you don't walk in the trenches with them.

Very often, the enemy within fights change, resists making bold decisions and balks at investments that are hard, such as growing the salesforce. When the enemy within takes over, energy and creativity wither quickly … although it may take decades for the company to die.

DRIVE HIGH PERFORMANCE, THE RIGHT WAY.

So how do you drive high performance while creating a safe workplace that values relationships built on trust and respect? The best leaders treat all people properly and respectfully, from clerks to CEOs. Everyone needs to help one another at a company because everyone's collective purpose is to serve clients. When strong leaders consider promoting people, they pick those who are respected by their colleagues and ask themselves, "Would I want to work for him? Would I want my kid to report to her?"

We must strive for continuous improvement, set high standards and emphasize the negatives when we observe them but always remember to make life fun. When I travel around the world and see our people and our company in action, I love it. And you must make it fun – not only because it has a positive effect on retention, attitude and the overall culture of the company but also because it leads to sharing and truth-telling.

I've enjoyed the show "Ted Lasso." He tries to get the best out of everybody, and he displays great gratitude. While I could get a little better at showing more gratitude on a day-to-day basis with my management team (I did give them biscuits in little pink boxes this year), they do know how much I trust, respect, appreciate and admire them.

Three additional things: You don't create a winning team by pandering to individuals. You must deal with conflict immediately, directly and forthrightly – problems do not age well. When people cannot do their job, they should not have that job. We should either work with them to find another role where they can thrive or ask them to leave. Just do it respectfully to everyone involved – do not embarrass people who have been working for the company.

Bring energy and drive – not just every day – but to every meeting and interaction.

Finally, sharing credit, recognizing the contributions of others, and not casting blame or finger-pointing all are critical to earning trust.

RETAINING TALENT IS IMPORTANT AND SO IS LIFE OUTSIDE OF WORK.

Retaining your best talent is essential. In addition to being treated with enormous respect, what people want most is a challenging job with meaningful work.

All companies have turnover in staff, and all turnover is not necessarily bad. People seek out new challenges, may find outside advancement opportunities or may just want a change in lifestyle. Sometimes good people leave because they are getting a better opportunity or increased compensation at another company. You should not be angry when someone receives a higher compensation offer from another company. No one likes to feel they are being taken advantage of — everyone wants to go home each day thinking they are treated fairly and equitably. And everyone has their own needs in terms of family, income, work-life balance and other factors.

But turnover can be bad, too. It is bad when inefficiency or bureaucracy or ineffective managers drive out good talent. It is still true that most people leave their job because they don't like their boss.

We also recognize and ask our employees to take care of their mind, body, spirit, soul, friends and family. While we do what we can to help them, we recognize that these are the most important things in their life, and we try to constantly remind them to give the needed time and attention to what they cherish most.

In Closing

I would like to express my deep gratitude and appreciation for the 270,000+ employees, and their families, of JPMorgan Chase. From this letter, I hope shareholders and all readers gain an appreciation for the tremendous character and capabilities of our people and how they have helped communities around the world. They have faced these times of adversity with grace and fortitude. I hope you are as proud of them as I am.

Finally, we sincerely hope that all the citizens and countries of the world see an end to this terrible pandemic, see an end to the war in Ukraine, and see a renaissance of a world on the path to peace and democracy.

Jamie Dimon
Chairman and Chief Executive Officer

April 4, 2022

Footnotes

Client Franchises Built Over the Long Term (page 8)

1 Certain wealth management clients were realigned from Asset & Wealth Management to Consumer & Community Banking in the fourth quarter of 2020. 2006 & 2011 amounts were not revised in connection with this realignment.

2 Federal Deposit Insurance Corporation ("FDIC") 2021 Summary of Deposits survey per S&P Global Market Intelligence. Includes a $1B deposit cap for market share. Includes all commercial banks, savings banks, and savings institutions as defined by the FDIC.

3 Barlow Research Associates, Primary Bank Market Share Database as of 4Q21. Rolling 8-quarter average of small businesses with revenue of more than $100,000 and less than $25 million.

4 Total payment volumes reflect Consumer and Small Business customers' digital (ACH, BillPay, PayChase, Zelle, RTP, ExternalTransfers, Digital Wires), non-digital (Non-digital Wires, ATM, Teller, Checks) and credit and debit card payment outflows. 2011 is based on internal JPMorgan Chase estimates.

5 Digital non-card payment transactions include outflows for ACH, BillPay, PayChase, Zelle, RTP, external transfers, and some wires, excluding Credit and Debit card sales. 2006 and 2011 are based on internal JPMorgan Chase estimates.

6 Represents general purpose credit card spend, which excludes private label and Commercial Card. Based on company filings and JPMorgan Chase estimates.

7 Represents general purpose credit card loans outstanding, which excludes private label, American Express Company (AXP) Charge Card and Citi Retail Cards, and Commercial Card. Based on loans outstanding disclosures by peers and internal JPMorgan Chase estimates.

8 Represents users of all web and/or mobile platforms who have logged in within the past 90 days.

9 Represents users of all mobile platforms who have logged in within the past 90 days.

10 Based on 2021 sales volume and loans outstanding disclosures by peers (American Express Company, Bank of America Corporation, Capital One Financial Corporation, Citigroup Inc. and Discover Financial Services) and JPMorgan Chase estimates. Sales volume excludes private label and Commercial Card. AXP reflects the U.S. Consumer segment and JPMorgan Chase estimates for AXP's U.S. small business sales. Loans outstanding exclude private label, AXP Charge Card, and Citi Retail Cards.

11 Inside Mortgage Finance, Top Primary Mortgage Servicers as of 4Q21.

12 Experian AutoCount data for 4Q21. Reflects financing market share for new and used loan and lease units at franchised and independent dealers.

13 ~$90 billion represents the December 31, 2021 balances for accounts provided payment relief, including those currently enrolled in relief and those who have exited relief. Includes Auto DCS and residential real estate loans held in Consumer & Community Banking, Asset & Wealth Management and Corporate.

14 Dealogic as of January 3, 2022.

15 Coalition Greenwich Competitor Analytics. Share is based on JPMorgan Chase's internal business structure and revenues; rank is based on Coalition Index Banks. 2006 rank analysis is based on JPMorgan Chase analysis. 2021 excludes the impact of Archegos.

16 Client deposits and other third-party liabilities pertaining to the Payments and Securities Services businesses.

17 Coalition Greenwich Competitor Analytics. Reflects Global Firmwide Treasury Securities business (Corporate & Investment Bank and Commercial Banking).

18 Based on Firmwide data using Regulatory reporting guidelines as prescribed by the Federal Reserve Board.

19 Institutional Investor.

20 Based on third-party data.

21 Nilson, Full Year 2020.

22 Assets under custody based on company filings.

23 Client deposits and other third-party liabilities.

24 Represents total JPMorgan Chase revenue from investment banking products sold to Commercial Banking clients.

25 Represents product revenue excluding deposit net interest income.

26 S&P Global Market Intelligence as of December 31, 2021.

27 Refinitiv LPC, Full Year 2021.

28 Aligns with the affordable housing component of the firm's $30 billion racial equity commitment.

29 Represents the Nomura star rating for Japan-domiciled funds and Morningstar for all other domiciled funds. Includes only Asset Management retail open-ended mutual funds that have a rating. Excludes money market funds, Undiscovered Managers Fund and Brazil- and Korea-domiciled funds. Mutual fund rating services rank funds based on their risk-adjusted performance over various periods. A 5-star rating is the best rating and represents the top 10% of industry-wide ranked funds. A 4-star rating represents the next 22.5% of industry-wide ranked funds. A 3-star rating represents the next 35% of industry-wide ranked funds. A 2-star rating represents the next 22.5% of industry-wide ranked funds. A 1-star rating is the worst rating and represents the bottom 10% of industry-wide ranked funds. The 'overall Morningstar rating' is derived from a weighted average of the performance figures associated with a fund's three-, five-and 10-year (if applicable) Morningstar Rating metrics. For U.S.-domiciled funds, separate star ratings are given at the individual share class level. The Nomura star rating is based on three-year risk-adjusted performance only. Funds with fewer than three years of history are not rated and hence excluded from this analysis. All ratings and the assigned peer categories used to derive this analysis are sourced from these fund rating providers as mentioned. Past performance is not indicative of future results.

30 In the fourth quarter of 2020, the firm realigned certain Wealth Management clients from Asset & Wealth Management to Consumer & Community Banking. Prior-period amounts have been revised to conform with the current presentation.

31 Traditional assets include Equity, Fixed Income, Multi-Asset and Liquidity assets under management; Brokerage, Administration and Custody assets under supervision.

32 Assets under management only for 2006.

33 Euromoney.

34 All quartile rankings, the assigned peer categories and the asset values are sourced from the fund ranking providers. Quartile rankings are based on the net-of-fee absolute return of each fund. The data providers re-denominate the asset values into U.S. dollars. This percentage of assets under management is based on fund performance and associated peer rankings at the share class level for U.S.-domiciled funds, at a primary share class level to represent the quartile ranking of the U.K., Luxembourg and Hong Kong funds and at the fund level for all other funds. The primary share class, is defined as C share class for European funds and Acc share class for Hong Kong and Taiwan funds. In case the share classes defined are not available, the oldest share class is used as the primary share class. The performance data could have been different if all share classes would have been included. Past performance is not indicative of future results. Effective September 2021 the firm has changed the peer group ranking source from Lipper to Morningstar for U.S.-domiciled funds (except for Municipal and Investor Funds) and Taiwan-domiciled funds to better align these funds to the providers and peer groups we believe most appropriately reflects their competitive positioning. This change may positively or adversely impact, substantially in some cases, the quartile rankings for one or more of these funds as compared with how they would have been ranked by Lipper for this reporting period or future reporting periods. The source for determining the rankings for all other funds remains the same. The classifications in terms of product suites and product engines shown are J.P. Morgan's own and are based on internal investment management structures.

35 Source: Company filings and JPMorgan Chase estimates. Rankings reflect publicly-traded peer group as follows: Allianz Group, Bank of America Corporation, Bank of New York Mellon Corporation, BlackRock, Inc., Charles Schwab Corporation, Credit Suisse Group AG, DWS Group, Franklin Resources, Inc., The Goldman Sachs Group, Inc., Invesco Ltd., Morgan Stanley, State Street Corporation, T. Rowe Price Group, Inc. and UBS Group AG. JPMorgan Chase ranking reflects Asset & Wealth Management client assets, U.S. Wealth Management investments and new-to-firm Chase Private Client deposits.

36 iMoneyNet.

37 Represents assets under management in a strategy with at least one listed female and/or diverse portfolio manager. "Diverse" defined as U.S. ethnic minority.

JPMorgan Chase Is in Line with Best-in-Class Peers in Both Efficiency and Returns (page 12)

1 Best-in-class peer overhead ratio represents the comparable business segments of JPMorgan Chase (JPM) peers: Capital One Domestic Card & Consumer Banking (COF-DC & CB), Goldman Sachs Investment Banking and Global Markets (GS-IB & GM), PNC Bank (PNC), Credit Suisse Private Banking (CS-PB) and T. Rowe Price (TROW).

2 Best-in-class all banks ROTCE represents implied net income minus preferred stock dividends of the comparable business segments of JPM peers when available, or of JPM peers on a firmwide basis when there is no comparable business segment: Bank of America Consumer Banking (BAC-CB), Goldman Sachs Investment Banking and Global Markets (GS-IB & GM), KeyBank (Key), UBS Global Wealth Management (UBS-GWM) and Morgan Stanley Investment Management (MS-IM).

3 Best-in-class G-SIB ROTCE represents implied net income minus preferred stock dividends of the comparable business segments of JPM G-SIB peers when available, or of JPM G-SIB peers on a firmwide basis when there is no comparable business segment: Bank of America Consumer Banking (BAC-CB), Goldman Sachs Investment Banking and Global Markets (GS-IB & GM), Wells Fargo & Company Commercial Banking (WFC-CB) and Morgan Stanley Wealth Management and Investment Management (MS-WM & IM). WFC-CB is the only G-SIB peer to disclose a comparable business segment to Commercial Banking.

4 Comparisons are at the applicable business segment level, when available; the allocation methodologies of peers may not be consistent with JPM's.

5 Bank of America Corporation (BAC), Citigroup Inc. (C), The Goldman Sachs Group, Inc. (GS), Morgan Stanley (MS) and Wells Fargo & Company (WFC).

6 Managed overhead ratio = total noninterest expense/managed revenue; revenue for GS and MS is reflected on a reported basis.

Size of the Financial/Sector Industry (page 27)

1 Consists of cash assets and Treasury and agency securities.

2 AUM includes Dry Powder, 2021 figure is annualized based on available data through Q1.

3 NYSE + NASDAQ; excludes investment funds, exchange-traded fund's unit trusts and companies whose business goal is to hold shares of other listed companies; a company with several classes of shares is only counted once.

4 Loans held by nonbank entities per the Federal Reserve Bank Z.1 Financial Accounts of the United States.

5 Facebook not included in 2010.

6 Private companies use the latest valuations.

7 Active users where applicable; data as of various points throughout the year due to the inconsistency of disclosure.

8 Inside Mortgage Finance and JPMorgan Chase internal data; consists of Top 50 Originators.

Consumer & Community Banking

It is with great pride that we write our first shareholder letter together as co-CEOs of Consumer & Community Banking (CCB), and we are especially proud to work alongside nearly 130,000 talented CCB colleagues. We took the reins of this industry-leading franchise from Gordon Smith in May 2021 and are grateful for his vision, leadership and mentoring. Our business has grown to serve more than 66 million households, including over 5 million small businesses.

Looking at the state of the CCB business today, we are operating from a position of strength on both an absolute and relative basis. However, we don't take this position for granted. Competition is everywhere, including banks and fintechs that are formidable in every one of our businesses. We acknowledge that we must continue to match the simplicity that new entrants bring to the customer experience before they are able to match our distribution and scale.

We are intensely focused on where we can provide more customer value, gain share and expand our capabilities in high-growth areas. As the past two years have reminded us, nothing is certain, and we will continue to prepare for all scenarios in order to be there for our customers.

Looking forward, we are focused on the following strategic priorities to drive shareholder value:

1) Best-in-class financial performance
2) Leveraging data and technology to drive productivity and agility
3) Driving engagement with experiences that customers love
4) Growing households and better serving customer needs to be the bank for all Americans
5) Protecting our customers and the firm through a strong risk and controls environment
6) Being the place everyone wants to work

BEST-IN-CLASS FINANCIAL PERFORMANCE

In 2021, CCB delivered a 41% return on equity on net income of $20.9 billion. Adjusting for $9.8 billion in credit reserve releases, our return on equity would have been 26%. Revenue of $50.1 billion was down 2% year-over-year, while our overhead ratio increased to 58% as we continued to invest heavily for future growth.

Our financial performance needs to be considered in the context of the rapidly evolving macro environment, which created both headwinds and tailwinds. Given the strength of our primary bank relationships, the impact of the extraordinary level of stimulus and relief programs on consumers and small businesses drove outsized growth in deposits. Average deposits of $1.1 trillion were up 24% over 2020.

Conversely, that same excess liquidity, coupled with a low rate environment, led to significant margin compression in deposits, deleveraging in credit card loans and accelerated levels of refinance activity in Home Lending. We ended 2021 with $434 billion in average loans, down 3%.

These factors, together with significant appreciation in home prices and used car values, drove exceptionally strong credit performance across our portfolios. Net charge-offs across portfolios were at historic lows, and we released $9.8 billion in credit reserves. Over the near term, we expect many of these macro-driven trends will start to normalize.

We invest with a long-term focus to drive sustainable growth and outperformance. Last year was no exception, and we identified opportunities to invest in

66+M

More than 66 million U.S. households served

#1

#1 in U.S. retail deposit market share

#1

#1 U.S. credit card issuer based on sales and outstandings

#1

#1 primary bank for U.S. small businesses

#1

#1 in total combined U.S. credit and debit payments volume

#1

#1 most-visited banking portal in the U.S.[1]

1 Based on 2021 monthly visit estimates provided by Similarweb for combined desktop and mobile visits when compared with peers.

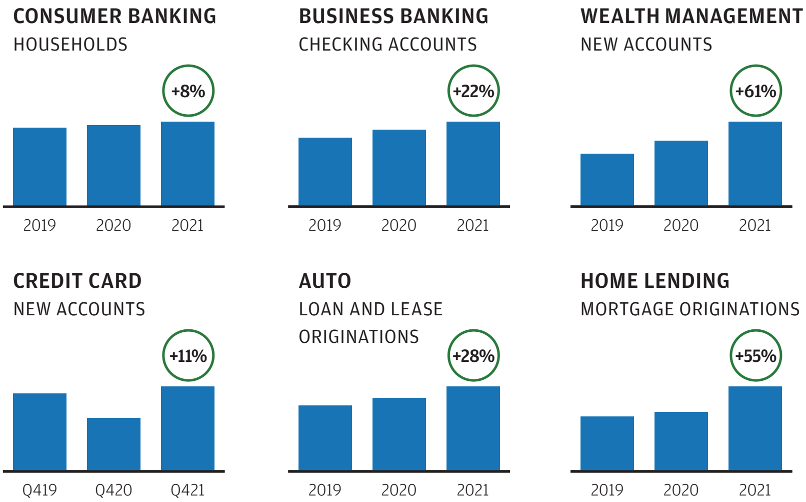
technology, data, products and customer experience — with a particular focus on areas where we can deepen our relationships and gain share. The best evidence of that success is our growth over the last three years.

LEVERAGING DATA AND TECHNOLOGY TO DRIVE PRODUCTIVITY AND AGILITY

Consumer behavior changed at the onset of the pandemic, largely driven by necessity. Thanks to our investments in technology and digital product capabilities, we were in a strong position to rapidly pivot our operating model to support our customers' needs. Many of these changes in consumer behavior represented an acceleration of secular trends for which we were already positioning the business, and we expedited our transformation to a design-led, agile product organization.

Now our goal is to mature this model. We are continuing to modernize our infrastructure and deepen our customer relationships by improving experiences. We're delivering new products and features to customers more quickly (in many cases, half the time it took a year ago) with the flexibility to continuously release new features. These productivity gains are meaningful to our customers and to our business.

2019 TO 2021 GROWTH



We are also using data to build a more comprehensive product continuum and engage with our customers in more personalized and relevant ways.

DRIVING ENGAGEMENT WITH EXPERIENCES THAT CUSTOMERS LOVE

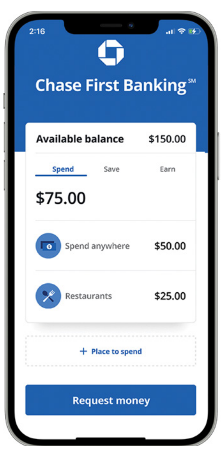
Our real engagement differentiator is the combination of our award-winning digital capabilities, our extensive physical network, and our nearly 50,000 local bankers, advisors, and relationship and branch managers. We are empowering our people with new tools and insights to advise our customers on their financial future and have delivered the highest satisfaction results in our history.

We think about our branches as a storefront — a place where digital engagement comes together with our bankers and advisors, who work every day to deliver the full capabilities of JPMorgan Chase. Thirty-six million unique customers walk into our almost 5,000 branches every year, generating about 85% of initial deposit balances. Our branch network is a powerful channel that most of our competitors don't have and can't easily replicate.

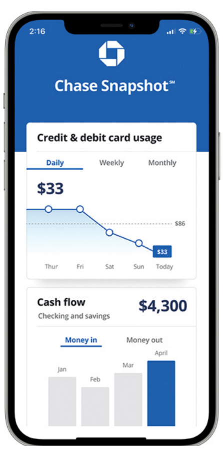
Our customer base of 59 million active digital users is the largest and fastest growing among major U.S. banks when comparing our growth in 2021. We have

WE ARE MEETING OUR CUSTOMERS WHERE THEY ARE WITH ...

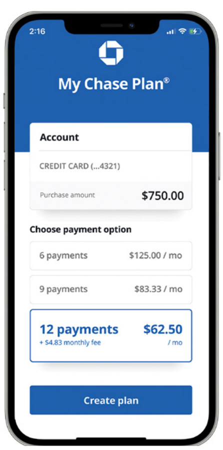
... New products



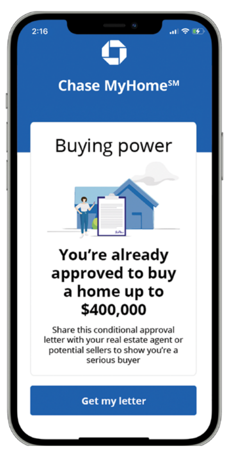
... Insights



... Flexibility



... Engagement



been simplifying the basics — things our customers do most often — such as opening an account, replacing a card, checking their credit score and making a payment.

Last year alone, our customers:

- Opened about 50% of consumer deposit accounts digitally
- Submitted nearly three-quarters of consumer mortgage applications digitally
- Safely and seamlessly moved more than $3 trillion in digital payments
- Processed more than 5 million card replacements digitally
- Initiated nearly 60% of their card transaction disputes through digital channels
- Took steps to improve their financial health, with 8 million customers engaging with Credit Journey monthly and 28 million in the program

We are intensely focused on building trust with customers in every community we serve by making investments that will have a lasting impact for families, small businesses and neighborhoods. And we're achieving this by having products, services and solutions that are relevant and valuable for all customer segments — so every customer believes we are the bank for them. Where we have gaps, we need to fill them, and we are.

For example, since our October 2020 Racial Equity Commitment, we have:

- Opened 10 additional Community Center branches and hired more than 100 Community Managers
- Hired more than 150 Community Home Lending Advisors focused on sustainable homeownership
- Expanded our homebuyer grant program, which includes $5,000 to help a customer cover a down payment and closing costs in 6,700 minority neighborhoods nationwide
- Provided free one-on-one coaching for business owners in 14 U.S. cities through dedicated consultants

GROWING HOUSEHOLDS AND BETTER SERVING CUSTOMER NEEDS TO BE THE BANK FOR ALL AMERICANS

We are focused on three major growth areas across CCB: optimizing our distribution network; expanding our U.S. Wealth Management business; and advancing our leadership in payments, lending and commerce.

Our distribution network

In 2021, we became the first bank to have branches in all the lower 48 states, and we are on track to deliver on our previous commitment, which was to open 400 new branches in 25 states and the District of Columbia. Over time, we will continue to optimize our distribution network as customer needs evolve. **Our goal is not to have the most branches — but to have the right branches, in more communities, serving the financial needs of our customers.**

As we expand our product offerings and earn deeper customer relationships and engagement, we have areas of opportunity to gain meaningful share.

U.S. Wealth Management

We are investing significantly in our U.S. Wealth Management business, which represents one of our biggest growth opportunities. We already have relationships with about half of affluent households in the United States, but we don't have a proportionate share of their investments. There are an estimated 13 million affluent Chase households who have a total deposit and investment wallet of approximately $17 trillion, and we are making progress in winning their investment relationships.

We had a record 2021:

- Increased investment assets by 22%
- Grew the number of investment households we serve by 12%
- Increased the number of advisors by 7%

We are going to continue to invest in our advisors, launch a new remote advice model and expand our self-directed capabilities. In addition, we will launch a new digital wealth planning tool available free to all Chase clients. These investments will position us well to earn a greater share of our clients' wallets.

Payments, lending and commerce

Payments are still the center of gravity for consumer financial relationships. We are a leading consumer payments

AT THE END OF 2017, OUR NETWORK CONSISTED OF:	OUR MID-TERM OUTLOOK IS TO HAVE:
5,130 branches	~5,000 branches
61% of the U.S. population covered by market	~85% of the U.S. population covered by market
76% of credit card customers in footprint	~90% of credit card customers in footprint
$5 trillion in addressable deposits by market	~$9 trillion in addressable deposits by market

franchise in the United States, enabling our customers to move $5 trillion each year across payment methods. Looking forward, we're obsessing over simple and seamless experiences to maintain that leadership position and give our customers more choice, flexibility and value.

We are the nation's #1 credit card provider, with leading airline and hotel co-brand cards. We are innovating to deliver more flexible borrowing options, partner benefits and more. Our leading programs already in the market produced meaningful results in 2021:

- **Chase Ultimate Rewards® loyalty redemptions:** 16 million customers redeemed points earned for travel, gift cards, cash back and other experiences
- **Chase Offers:** 15 million customers engaged with valuable discounts for shopping at specific merchants
- **My Chase Plan®:** Nearly 625,000 credit card customers used this buy-now-pay-later option

One in every four dollars spent on travel in the United States is on a Chase card, so travel is a natural place for us to offer shopping, payment and borrowing experiences at scale. With our acquisition of cxLoyalty, we now have a wholly owned proprietary travel platform, currently ranked among the top travel agencies in the United States. Our card and platform assets will enable us to deliver premium, personalized travel-booking experiences, fully integrated payments features and lending flexibility.

Over time, we will expand our payments, lending and loyalty experiences. With data from more than 66 million households and over 11 billion impressions through our own channels, we are in a great position to understand where our customers search, shop and build loyalty. Our goals are to meet our customers where they are, deliver ease and value in shopping experiences, and capture incremental spend-and-lend share.

PROTECTING OUR CUSTOMERS AND THE FIRM THROUGH A STRONG RISK AND CONTROLS ENVIRONMENT

Our risk and controls environment is essential to a healthy, thriving business. Therefore, protecting our customers and the firm is job number one for everyone in CCB. It is only by getting this right that we are able to innovate and make financial services seamless and easy for our customers.

We continue to focus on having the proper governance and processes in place to ensure that our business is sustainable and resilient in order to meet our regulatory and customer expectations. We're using enhanced capabilities in data and analytics to be more surgical in extending credit and managing risk. We're also using our data in a leadership role to develop an industry utility to responsibly expand access to credit to many of the nearly 50 million people in the United States who have no usable credit score[2].

BEING THE PLACE EVERYONE WANTS TO WORK

We believe delivering a great customer experience is inextricably linked to providing a great employee experience. We know having a strong culture with diverse talent is the only way we are going to achieve everything we have just mentioned. And we acknowledge that competition for talent — especially ours — has never been more fierce. We approach talent management as we do any aspect of the business: We maintain high standards, set goals, and honestly measure progress by analyzing our data, listening constantly and recognizing success.

We are proud of our efforts but are never satisfied. In 2021, we continued to improve representation of Asian, Black and Hispanic talent among our employees. Our commitment to diversity goes beyond hiring and includes a focus on development and inclusion. Our promotion rates of ethnically diverse people are also on the rise, which has had a positive effect on representation across many levels.

IN CONCLUSION

We approach our opportunities and challenges with great humility, yet we have tremendous confidence about our future and wouldn't trade our hand with anyone. Our scale, our assets and — most important — our people position us well to be the bank for all Americans.

Marianne

Marianne Lake
Co-CEO, Consumer & Community Banking

Jenn

Jennifer Piepszak
Co-CEO, Consumer & Community Banking

2 Office of the Comptroller of the Currency Project REACh Fact Sheet.

Corporate & Investment Bank

2021 was another extraordinary year for our business.

Economies started to emerge from the shadow of the pandemic. Company order books began to fill up once more, and demand for energy, cars, travel and home improvements returned.

New virus outbreaks continued to appear, however, and supply chains remained disrupted. In addition, the tumultuous market environment of 2020 did not normalize as much as expected, and through the year, we raised nearly $1.5 trillion in capital and extended almost $700 billion in credit for clients around the world as they responded to the ongoing crisis. With the pandemic in its second year, thousands of companies had to make bold moves to survive and thrive, igniting a nearly $6 trillion deal boom and the busiest year on record for our M&A franchise.

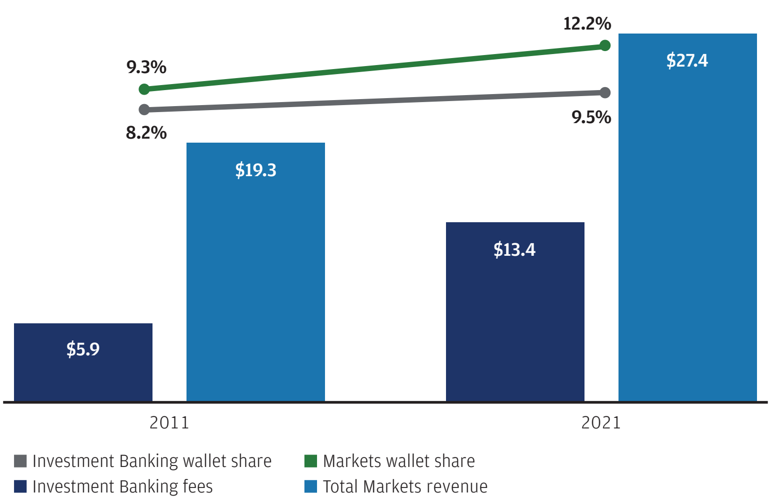
The COVID-19 pandemic provided a rigorous test of our business model. It is a course we set 10 years ago when we combined our Investment Bank, Treasury & Securities Services business and Global Corporate Bank in a bid to create the strongest and most complete Corporate & Investment Bank (CIB) in the industry.

We set out to be global, diversified, complete and at scale and to provide a safe haven for clients in times of stress. We aimed for both league-topping performance and stable returns so we would be able to invest continuously and consistently, always with an eye to the future.

A decade later, we can reflect on the merits of that decision. Today, the CIB operates in 100+ countries and 100 currencies, serves more than 90% of the Fortune 500 and has leadership positions across every major business line.

INVESTMENT BANKING FEES AND MARKETS REVENUE

($ in billions)



Source: Coalition Greenwich Competitor Analytics; Dealogic; J.P. Morgan

Revenue from our combined businesses has grown from $34 billion in 2011 to $52 billion in 2021; return on equity has risen from 17% to almost 25%; fees in Investment Banking have more than doubled; and in trading, revenue from our Equities desk has soared from $4.5 billion 10 years ago to $10.5 billion in 2021.

In 2011, we launched a securities joint venture in China to open up the country's dynamic markets to investors and give domestic firms the chance to expand overseas. In 2021, we became the first foreign bank to fully own a securities company there. Meanwhile, we have nearly doubled the number of corporate bankers outside the United States to better serve major multinationals around the world. Helping midsized companies, too, has remained a priority, and Investment Banking revenue from our partnership with Commercial Banking has more than tripled in 10 years to $5.1 billion in 2021.

A decade of rock-steady support for our clients, along with disciplined and ongoing investment in our business, culminated in the CIB's best-ever year in 2021.

THE YEAR IN REVIEW

The CIB achieved a 25% return on equity in 2021 by generating record earnings of $21 billion on record revenue of $52 billion. For the 11th consecutive year, we retained our position as the world's pre-eminent corporate and investment bank[1].

Our Investment Banking business ended 2021 with a record 9.5% market share, generating $13 billion in fees, nearly $4 billion more than 2020's previous high.

1 CIB revenue based on Coalition Greenwich Competitor Analytics. Investment Banking fees based on Dealogic.

Businesses flush with cash made decisive bets to address strategic gaps, driving the surge in M&A volumes. In a standout year, J.P. Morgan advised on more than 630 deals totaling $1.5 trillion, including the year's biggest deal, Discovery's announced $96 billion combination with AT&T's WarnerMedia segment. M&A revenue increased by more than 80% compared with the last two years, and wallet share reached an all-time high of 10.2%.

In Debt Capital Markets, just as we have done over the last decade, J.P. Morgan finished the year with the top ranking in the debt and loan markets, completing more than 4,200 deals and retaining an approximate 10% share of the market. Activity was bolstered in large part by the M&A boom and deals to shore up companies affected by the evolving COVID-19 crisis.

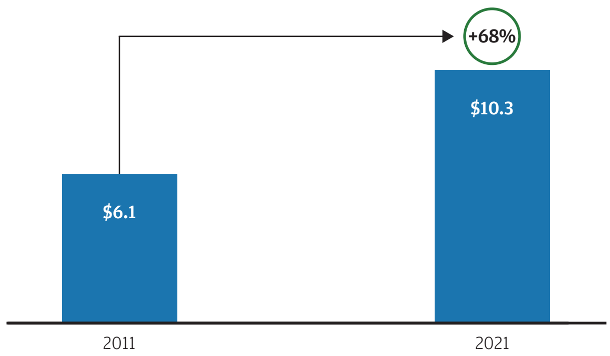
In Equity Capital Markets, J.P. Morgan raised more than $435 billion across nearly 700 deals. In a year that saw initial public offering issuance jump over 85% to record levels, our team led seven of the 10 biggest listings of the year.

Another recent trend is the growth in private capital markets as investor demand grows and companies stay private for longer. In 2021, from offices in New York, San Francisco, Los Angeles, London and Hong Kong, our Global Private Capital Markets team set new records, raising approximately $50 billion for clients.

In our Markets business, 2021 revenue of $27 billion was down from 2020's highs as industry wallets started to normalize. Still, our trading businesses generated extremely strong results, particularly in Equities, which had its best-ever year, reporting $10.5 billion in revenue, up 22%, while our Fixed Income desk reported $17 billion in revenue and retained its #1 ranking for wallet share. Another notable success in 2021 was our Global Research team's top ranking across all three of *Institutional Investor*'s annual global surveys, the first time any provider has achieved this accolade in the publication's history.

FIRMWIDE PAYMENTS REVENUE

($ in billions)



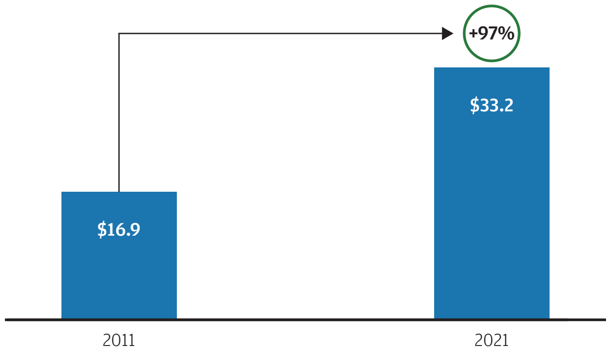
Our Securities Services business, which provides essential post-trade services to our institutional asset-manager and asset-owner clients, also had a strong year, reporting $4.3 billion in revenue. This is a business we have been investing — and winning — in for several years. In 2021, the team continued this momentum with more than $4 trillion in client assets onboarded and notable business wins, including a $700 billion share of BlackRock's exchange-traded funds business. Assets under custody[2] in this unit have almost doubled since 2011, up from $17 trillion to $33 trillion in 2021.

Our rebranded J.P. Morgan Payments business, which includes Treasury Services, Trade Finance, Card and Merchant Services, continued its impressive record of growth, generating firmwide revenue of more than $10 billion, up 7% for the year. Over the last five years, the business has grown market share from 4.5% to 7.2% and, since the formation of the CIB, average deposits across the business have more than doubled, up from $319 billion to $715 billion. The business has also boosted its blockchain and automation capabilities so clients can move money around the world quickly, safely and easily. As the world's largest transaction bank, the business moves, on average, more than $9 trillion every day and remains #1 in U.S. dollar clearing by volume. In other major developments during 2021, the business took a majority stake in Volkswagen's payments platform, as competition in the connected car market accelerates.

2 Represents assets held directly or indirectly on behalf of clients under safekeeping, custody and servicing arrangements.

ASSETS UNDER CUSTODY IN SECURITIES SERVICES

($ in trillions)



THE COMPETITIVE LANDSCAPE

While we achieved all-time records in 2021 in a number of different areas, we cannot afford to be complacent. From long-established rivals to Big Tech and fintechs, the competitive threat is fierce and varied.

We are in a privileged position. Our consistent investment over the last 10 years lends us tremendous firepower for the future. Technology has always been a priority, and we have built some exceptional platforms that are high performing and resilient and work well at scale. In recent years, our focus has turned toward modernizing that infrastructure and using the cloud to increase our speed, output and agility so we can serve clients better and faster, particularly as we compete with fintech entrants.

Our greatest competitive advantage, however, is the talented people we have at J.P. Morgan. Their resilience and commitment throughout 2021 were remarkable. Even through the pandemic, we retained much of our top talent while taking opportunities to recruit diverse new talent with fresh perspectives. During 2021, more than 50% of CIB hires were diverse.

HELPING MORE PRIVATE COMPANIES

In Investment Banking, there remains significant opportunity related to the rapid growth of private capital markets. Over the past 20 years, the number of U.S. private companies has increased exponentially while the number of listed companies has declined, and capital raises for private companies have grown almost three times as fast as those for public ones. In 2021, J.P. Morgan bankers raised $50 billion for private companies. More investment capital is being allocated to this space — and more companies are staying private longer — than ever before.

Looking ahead, another opportunity exists in serving the thousands of smaller, earlier-stage private firms that are clients of our Commercial Banking business. And we want to expand our services to an even wider set of private companies, connecting them seamlessly with investors and providing benchmarking for future capital raises.

DATA IS THE DIFFERENTIATOR

In Securities Services, data is a critical enabler for investor clients in driving efficiency, performance and growth. Asset managers use a variety of data sources to run their business, and the effort required to gather, cleanse and organize this data can be significant.

Data services has become a differentiator in the securities services business, and J.P. Morgan is in a unique position to address the challenge data management presents. We are developing solutions to provide our clients with seamless and efficient access to data, enabling them to unlock new insights and opportunities.

SERVING ONLINE MARKETPLACES

In Payments, we see major growth opportunities as online marketplaces — big and small — are experiencing explosive growth and looking to offer additional financial solutions to their customers.

Today, online marketplaces account for more than half of e-commerce sales globally, and the CIB's Payments business wants to be the one-stop shop for all of their needs. From accepting payments to creating a seamless checkout experience, managing payments in multiple currencies and aggregating and analyzing data, J.P. Morgan has everything clients need to build and scale successful platforms.

TRADING ANYWHERE, ANYTIME

More and more, participants in trading markets are using digital portals and electronic trading strategies. They want the ability to trade round the clock and round the globe, making multi-dealer platforms and nontraditional competitors more popular. In Markets, we are using our scale and strength to increase options for clients, building out our own proprietary channels that connect to others in order to streamline the experience from pre-trade to post-trade. Offering reliable liquidity in all market conditions, combined with our ability to harness data and deliver more intelligent, targeted services, will be key to serving clients now and in the future.

Behind all these innovations is our desire to improve the client experience. Across our firm, whether our clients are retail customers or multinationals, the quality of service we provide and how we deliver it will determine whether they choose to remain with us or take their business elsewhere.

Our approaches to private capital, data and marketplaces are ways to create a more holistic client experience. By harnessing capabilities across our firm, we are expanding our service “ecosystem” and addressing more of our clients' needs through the J.P. Morgan platform than we ever thought possible 10 years ago.

CLIMATE ACTION TARGETS

We understand the urgency to combat change in our climate, and we are taking action.

In 2020, JPMorgan Chase achieved carbon neutrality in our own operations and spelled out how we will decarbonize our financing portfolio over the next decade. In 2021, we became the first U.S. bank to release sector-specific emission reduction targets as part of our commitment to align portions of our financing portfolio with the Paris Agreement.

In 2021, we also announced a new target to finance and facilitate $2.5 trillion over the next 10 years to further sustainable development, including $1 trillion to support green initiatives. And we are advising companies on how they can reduce their own carbon footprint in a practical, equitable way. Ensuring the consistent supply of reasonably priced energy to consumers during the transition is a huge focus.

Sustainable and low-carbon businesses are rushing to develop new technologies. While many of these companies and technologies are mature, many more are just getting started. They will need capital and advice to help them innovate and evolve. We intend to lend our considerable resources to the challenge.

PARTNERING THROUGH THE PANDEMIC

In 2021, COVID-19 continued to test us and our clients, and I am incredibly proud of how our teams rallied, serving companies and governments around the world. We adapted, were flexible and stayed connected.

In 2022, the combination of mass immunity, vaccinations and antiviral drugs should bring an end to the pandemic and make COVID-19 an endemic, manageable virus.

While there are still tight restrictions in certain parts of the world, many economies are opening up again, releasing pent-up consumer and corporate demand. Businesses and investors are hungry to put capital to work. Rising interest rates and their impact on expected loan growth will likely be tailwinds for our business.

There will be challenges for all of us in the near term as we continue to work through the pandemic's consequences and begin to wean global economies off the financial life support they have received over the past few years. As expected, the normalization of monetary and fiscal policies, coupled with rising inflation, has created more uncertainty in markets.

Of immediate and urgent concern, however, is what is taking place in Ukraine: devastation for its citizens and a massive humanitarian crisis in Europe. The situation has, without question, intensified anxiety in global markets, particularly commodity markets.

The full economic ramifications of the conflict, including the potential effects on global growth, can’t yet be measured. Of much greater importance, the human cost is also yet to be determined. Our firm has pledged support to the relief efforts and will continue to do so, hoping for peace in the region soon.

CONFIDENCE IN THE FUTURE

Ten years ago, we brought the Corporate & Investment Bank together in the belief that as a whole, we would be greater than the sum of our parts. And it has proved to be a lasting success.

Our unique combination of stability and innovation, coupled with our enduring culture of collaboration and of putting our clients first, gives me great confidence for the decades to come.

Daniel E. Pinto
President and Chief Operating Officer,
JPMorgan Chase & Co., and
CEO, Corporate & Investment Bank

Commercial Banking

This past year confirmed there is absolutely no limit to what our Commercial Banking (CB) team can accomplish when we work together. While 2021 showed signs of optimism, our clients continued to face uncertainty, confronting an ongoing pandemic, accelerated inflation, disrupted supply chains and tight labor markets. Through it all, we stood by our clients and communities, providing them with resources and expertise to best navigate these challenges.

2021 also marked another year of building for our future, investing in our capabilities for our clients, supporting our communities, and delivering strong growth and returns for our shareholders.

DELIVERING RECORD FINANCIAL PERFORMANCE

Highlighting the strength and potential of our franchise, CB delivered outstanding financial results in 2021, with record revenue of $10.0 billion, net income of $5.2 billion and a return on equity of 21%.

These results are particularly notable as low market interest rates negatively impacted our deposit spreads and loan balances remained under pressure last year.

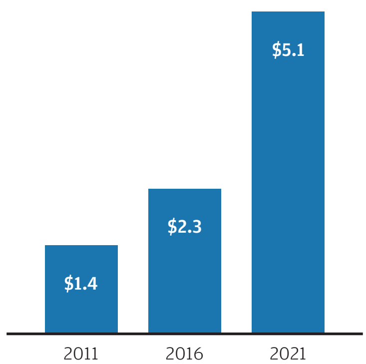
Despite challenging market fundamentals, CB's credit performance was quite strong in 2021, with net charge-offs of 4 basis points. Our consistent underwriting discipline and rigorous client selection continued to serve us well, and we are prepared for a range of potential economic outcomes.

Our firm's unmatched, broad-based capabilities remain a key differentiator and growth driver for our business. In 2021, investment banking was a standout example of this, with revenue increasing 52% to a record $5.1 billion. We also had a record year across CB in payments[1], with revenue reaching $1.8 billion, up 15% from 2020.

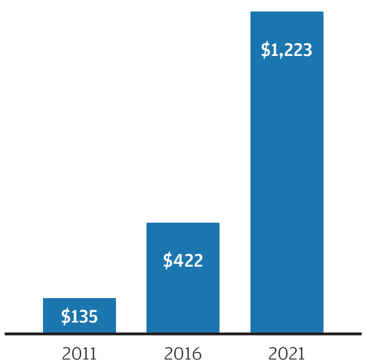
While we are very proud of our financial performance, we are even more excited about the possibilities ahead.

MAINTAINING STRONG PERFORMANCE

CB Gross Investment Banking Revenue[2]
($ in billions)



Middle Market Expansion Revenue
($ in millions)



1 Represents product revenue excluding deposit net interest income.
2 Represents total JPMorgan Chase revenue from investment banking products provided to CB clients.

EXPANDING OUR EXCEPTIONAL CLIENT FRANCHISE

The opportunity to invest and expand our client franchise is enormous, and we remain focused on executing our long-term, disciplined strategy to acquire more great clients and build deep, enduring relationships over time. With consistent investment, our addressable market continues to grow, and we are currently calling on almost 45,000 prospective clients.

CB's Middle Market expansion is a terrific example of recognizing a market opportunity and executing a data-driven, organic growth strategy. Since 2008, we have added over 500 bankers covering companies in 72 new locations across 22 states — essentially doubling our footprint in the United States. In 2021, this targeted effort generated $1.2 billion in revenue, with $19.5 billion in average loans and $34.8 billion in deposits.

We are also quite excited about expanding our client franchise internationally. Over the last three years, we've added about 50 bankers covering 19 countries, aligned to over 2,000 active and prospective clients. This is a natural extension of what we are doing today across the United States and builds upon existing, in-country capabilities and JPMorgan Chase's global platform. We are off to a great start — momentum is increasing, and we have a growing number of high-quality clients.

Across all of these markets, our clients expect us to truly understand their business and industry. Over the last decade, we have established 18 specialized industry banking teams dedicated to important sectors like government, healthcare and technology. More than

SUPPORTING THE GREEN ECONOMY

The Green Economy Banking team, established in 2021, provides dedicated support to businesses focused on:

By providing industry expertise, financing and investment banking services, CB is helping green businesses grow and catalyzing a more sustainable future.

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half of our clients[3] are supported by our specialized bankers, and these teams provide deep sector expertise and deliver industry-specific solutions.

INVESTING TO DELIVER MORE VALUE

Empowering our team

Simply having more bankers in more locations is not our only objective. It is the quality and impact of our team – along with the breadth of our capabilities – that allow us to develop long-term, valuable relationships with our clients. Today, our teams provide a growing range of solutions and solve complex technical problems for our clients. To further empower our bankers, we are making investments to ensure they are technically trained, data enabled and equipped with the most powerful digital tools.

Building a data-driven business

We have incredible data assets across our firm and have been investing in our foundation and capabilities to become a truly data-driven business. As a result, we now have a scalable, cloud-based data platform to deliver meaningful value across a range of applications.

These rich data assets bring predictive insights that enhance the speed and precision of our credit decisioning and portfolio management. We are also working on ways to provide impactful analytics and business forecasting and benchmarking to our clients. Our data capabilities further enable our bankers – informing them on market opportunities, client insights, product trends and pricing.

This focus has opened an exciting frontier for us. As such, we are increasing our investment in this differentiating resource and expect to see our data assets become even more valuable to our franchise and our clients.

Developing powerful solutions

Our clients benefit directly from our firm's leading digital and payments platforms. In addition, CB's treasury management and core banking capabilities are developed with a deep understanding of our clients' objectives and tailored to their specific needs.

We also have an incredible opportunity to add incremental revenue streams by delivering new, innovative solutions for our clients. For example, in Commercial Real Estate, we have been building a digital platform that allows our clients to more effectively manage their real estate assets, deploying data and analytics while digitizing and streamlining their rental payment activities. We are in the early stages of bringing this functionality to market, and client feedback has been terrific.

STRENGTHENING OUR COMMUNITIES

CB takes great pride in being an active and visible member in our communities. As our neighborhoods emerge from the pandemic, it's critical that they receive

STRENGTHENING OUR COMMUNITIES

$20B+

TO VITAL INSTITUTIONS, SUCH AS HOSPITALS, GOVERNMENTS AND SCHOOLS[4]

$13B+

TO CREATE AND PRESERVE MORE THAN 100,000 AFFORDABLE HOUSING UNITS

$575M+

IN NEW MARKETS TAX CREDIT INVESTMENTS

$350M+

TO COMMUNITY DEVELOPMENT FINANCIAL INSTITUTIONS

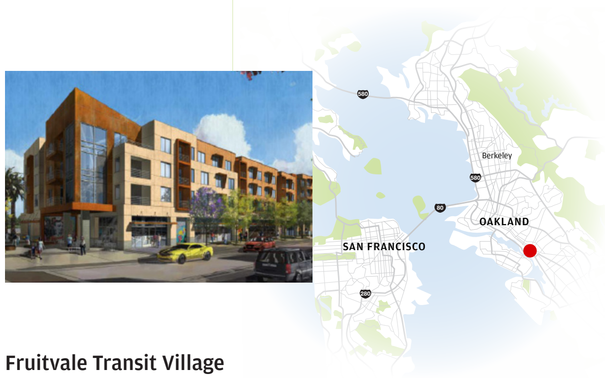
$100M+

TO BLACK-, HISPANIC- AND LATINO-OWNED OR -LED FINANCIAL INSTITUTIONS

3 Refers to U.S.-based clients only.
4 Includes new credit commitment originations and existing credit commitments that experienced a major modification during 2021.

Auburn Gresham Healthy Lifestyle Hub

CB invested more than $4 million in the redevelopment of a 50,000-square-foot building in Chicago, Illinois. When completed, this will be a multi-tenant healthy lifestyle hub that fills an absence in the neighborhood. This new facility will bring professional training and job opportunities to the community.



Fruitvale Transit Village

CB provided two nonprofits, The Unity Council and Bridge Housing, with a $90 million loan to build transit-oriented affordable housing for working families in Oakland, California. The building will create 181 affordable units and commercial space for an organization focused on ending youth criminalization and incarceration.

the appropriate support and resources they need to thrive. In 2021, we amplified our community impact work by further supporting vital institutions, strengthening diverse businesses and expanding affordable housing that our communities need now more than ever. I'm incredibly proud of our progress. Last year, CB extended more than $20 billion in credit to vital institutions – such as hospitals, governments and schools – that keep our communities healthy, stable and vibrant.

To help break down the systems that have contributed to widespread economic inequality – especially for Black, Hispanic and Latino people – last year we made equity investments of more than $100 million in 16 diverse financial institutions to accelerate growth in underserved areas. We also established dedicated banking teams to better connect diverse-, women- and veteran-owned businesses to the firm's full spectrum of resources to best support their success.

Availability of affordable housing is also crucial to combating the broader social inequities in our society. In 2021, our Commercial Real Estate team helped increase access to safe and stable places to live in underserved communities by providing over $13 billion in financing to create and preserve more than 100,000 affordable housing and rental housing units across the United States.

CB is committed to making a positive difference in our communities and advancing solutions that will drive real, sustainable progress for generations to come.

LOOKING AHEAD

As we look forward, I've never been more optimistic about our business. We have an extraordinary team, unmatched capabilities, and an outstanding and growing client franchise. While the coming year will likely bring challenges and surprises – we are ready. With 2022 unfolding, we already see the benefits of being back together in the office and out in the local markets with our clients. The power of human connection is undeniable and is the foundation of our strong relationships with both our clients and our partners within the company.

The opportunities ahead for CB are tremendous, and we will continue to invest in executing our long-term strategy, always keeping our clients at the center of everything we do. Equally as important, we will continue to embrace our commitment to being a positive force in our communities.

I can't thank all of my colleagues enough for what they do every day to make our business so special. They are the source of my confidence in our future.

Douglas B. Petno
CEO, Commercial Banking

Asset & Wealth Management

Perspective and experience are key points of distinction for our clients in times of volatility and uncertainty. J.P. Morgan Asset & Wealth Management (AWM) has been managing assets for institutions and individuals around the world for over 180 years. While recent years have presented many unique challenges, our approach has remained consistent throughout: Rely on disciplined research, incorporate our deep experience in developed and emerging markets, and rigorously manage risks. As markets and economies have become more interconnected, clients increasingly seek global solutions combined with local expertise, and AWM is well-positioned to be the most trusted partner.

FOUR INGREDIENTS FOR FUTURE GROWTH

We accelerated our growth agenda over the last few years. By focusing on four ingredients to drive our growth – maintain strong investment performance, recruit and retain the best talent, attract new clients and generate flows – AWM delivered record financial performance across a number of metrics.

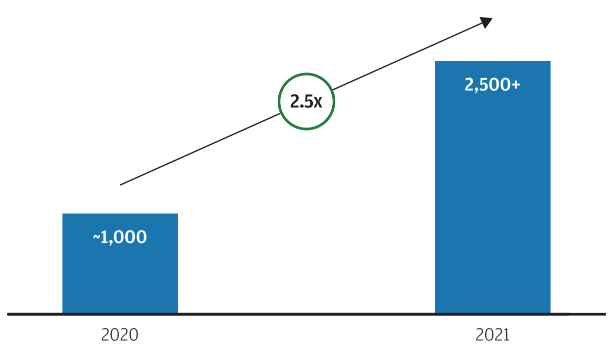
1) Investment performance

With a laser focus on client outcomes – across more than 600 investment strategies and delivered by over 1,100 investment professionals in 20+ markets – we have achieved top investment performance across most asset classes over most time periods.

2) New talent

Our focus on talent includes retaining existing employees and attracting new professionals to our firm. In 2021, we retained nearly 95% of top senior talent and more than doubled the number of front office joiners to over 2,500, a record for AWM, despite competitive pressure in our industry. In particular, we are making progress against our ambitious Global Private Bank (GPB) growth strategy, adding nearly 300 net new client advisors in 2021. Our new advisors are also exceeding our expectations – approximately 50% are surpassing their targets – and are making meaningful contributions to our business. Roughly 15% of GPB client asset net flows in 2021 were generated by new advisors.

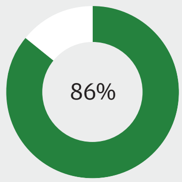
ASSET & WEALTH MANAGEMENT FRONT OFFICE JOINERS



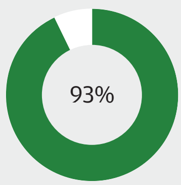
INVESTMENT PERFORMANCE

2021 % of J.P. Morgan Asset Management Long-Term Mutual Fund AUM Outperforming Peer Median Over 10 Years[1]

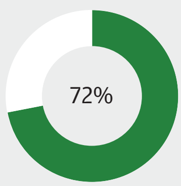
Total J.P. Morgan Asset Management



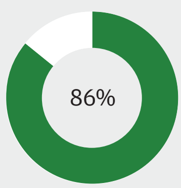
Equity



Fixed Income



Multi-Asset Solutions & Alternatives



AUM = Assets under management

3) New clients

Attracting new clients requires a combination of excellent investment performance, relentless engagement and the full power of the J.P. Morgan platform. In 2021, we were grateful to welcome a record number of new clients to AWM, continuing our momentum — over the past five years, the number of net new GPB clients tripled. We expect our record historic numbers of new hires and the quality of our people to continue to drive strong net new client growth into the future.

4) Client asset flows

Each and every year, clients vote with their feet. And the best evidence of our success generating strong investment performance, attracting exceptional talent and satisfying our growing number of clients is flows. Our flows have accelerated over the past few years, reaching a record $389 billion in 2021 — more than five times our average annual net flows from 2012 to 2018.

Equally important, our record flows were distributed across our broad, diversified platform. In 2020 and 2021, AWM achieved net positive inflows across all products, client segments and regions.

RECORD FINANCIAL RESULTS

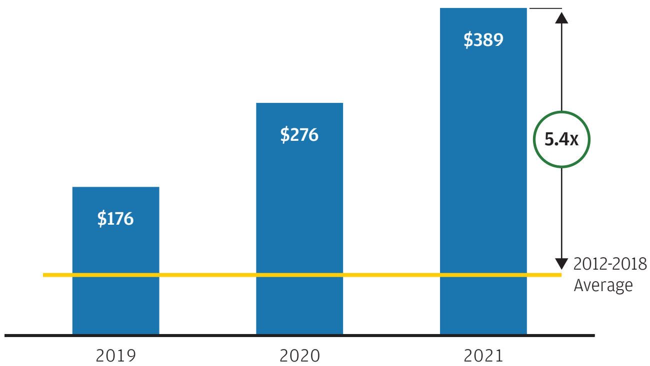
Flows were not the only record outcome in 2021: Financial performance was very strong across the board, with record AWM revenue, pre-tax income, net income, loans and total client positions. Importantly, assets under management reached $3.1 trillion, and assets under supervision reached $4.3 trillion, both all-time highs.

OPERATIONAL EFFICIENCY

Last year, I wrote that operational efficiency was a key priority for us. We continue to relentlessly eliminate pain points, drive digitalization throughout the organization and build scalability in all of our processes. Some areas of focus

ASSET & WEALTH MANAGEMENT CLIENT ASSET NET FLOWS

($ in billions)



RECORD RESULTS IN 2021

Flows	Loans	Total Client Positions	Revenue	Pre-tax Income	Net Income
$389B	$218B	$4.5T	$17B	$6B	$5B

OPERATIONAL EFFICIENCY

Increase in average speed

PERFORMANCE REPORTING

24x

FASTER

ACCOUNT OPENING

5x

FASTER

MORTGAGE REFINANCING

2x

FASTER

1 For footnote, refer to page 47 footnote 34 in this Annual Report.
2 Global Shares acquisition is subject to regulatory approvals and expected to close in the second half of 2022.
3 As of June 2021.
4 As of March 2022.
5 Diverse refers to individuals who identify as U.S. ethnic minority.
6 For footnote, refer to page 47 footnote 37 in this Annual Report.
7 Financial institution partners include minority depository institutions and community development financial institutions. Partners receive payment for services related to institutional clients' investments in the Empower share class.

LEVERAGING M&A TO DRIVE GROWTH

AWM has been active in M&A in recent years, following our discussion of the topic at 2020 Investor Day. We completed three transactions — 55ip, Campbell Global and OpenInvest — and recently announced our intent to acquire Global Shares[2]. These companies are among the best in their field and will enable us to deliver the next generation of digital, personalized and ESG solutions to our clients.

55ip

A financial technology company with proprietary capabilities that enable financial advisors to deliver tax-smart investment strategies at scale.

CampbellGlobal
FOREST & NATURAL RESOURCE INVESTMENTS

A global timberland investment manager with $5.3 billion in assets under management and over 1.7 million acres managed worldwide in 15 U.S. states, New Zealand, Australia and Chile[3].

OpenInvest®

A financial technology company that helps financial professionals customize and report on values-based investments with 20+ proprietary values-based causes[4].

Global Shares

A cloud-based provider of share plan management software with an expansive client base of over 600 corporate clients and nearly $200 billion in assets under administration across 650,000 corporate employee participants[2, 4].

include straight-through processing, client onboarding, and data structuring and organization.

INVESTING IN KEY AREAS

With the results over the past few years validating our strategy, we expect to continue making significant investments in our business. Particular areas of focus include:

- **Advisor hiring:** We continue to seek to be the employer of choice for advisors looking to join a team-oriented provider of industry-leading investment solutions and first-class advice.
- **Personalization:** With the addition of 55ip and OpenInvest, AWM has become an innovator, giving clients the ability to reflect their personal values in their portfolios, which is an important growth area for our industry.
- **Alternatives:** In 2021, we added more than 50 investment professionals and new platforms in Private Equity, Private Credit and Campbell Global.

DRIVING DIVERSITY, EQUITY AND INCLUSION

As a firm, we are doing everything we can to drive toward a more diverse, equitable and inclusive workforce and community.

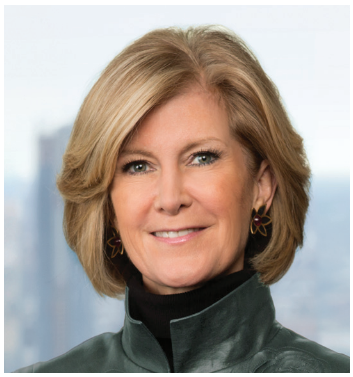
In AWM, we tripled the number of diverse[5] external hires in just one year, and the majority of our 2021 analyst class was composed of female and/or diverse[5] professionals. **In Asset Management, 60% of assets under management are managed by female and/or diverse portfolio managers**[6].

AWM also launched a number of initiatives aimed at improving diversity, equity and inclusion in our community. We are co-investing alongside Ariel Alternatives to drive the growth of emerging minority-owned or -managed private companies. Within Alternatives, we have teams that are specifically targeting diverse-owned or -managed funds or companies to make investments. In our industry-leading money market fund platform, we launched the Empower share class, which creates a new income stream for our minority- and diverse-led financial institution partners[7].

WELL-POSITIONED FOR THE FUTURE

We are very proud of the performance and growth we have delivered to our clients and shareholders and are excited about the opportunities that lie ahead. Most important, each and every one of our 22,762 employees is focused on doing first-class business in a first-class way.

We prioritize our fiduciary duty to our clients above everything else, relentlessly focusing on and listening to our clients to improve their experience and build stronger outcomes. As the world faces new challenges, AWM is well-positioned to deliver strong investment performance and innovation at scale, while maintaining robust controls. If we keep this focus, I am confident that our success will continue to follow.



Mary

Mary Callahan Erdoes
CEO, Asset & Wealth Management

Corporate Responsibility

We have learned some important lessons navigating the challenges of the past few years. We faced a pandemic, a growing wealth gap, continued social and racial unrest, and a war in Ukraine resulting in a devastating humanitarian crisis. It has also been a chance for companies like ours to step up and, with a deliberate and coordinated approach, help move toward a better direction.

Building on what we've learned, today JPMorgan Chase is integrating this approach into how we do business. We are scaling data-based ideas to support our customers, clients, communities and employees to address issues ranging from sustainability to racial equity to inclusive economic growth. This smart strategy is what drew me to this firm.

"Long-term business success depends on collective societal success."

Challenges such as systemic inequality and economic disparity run deep, but they are not insurmountable. It is the responsibility of all of us — from government to the private sector — to advance solutions and build an equitable society and economy.

In September 2021, I joined JPMorgan Chase as global head of Corporate Responsibility because of this firm's unique position to make an impact. For nearly 10 years, JPMorgan Chase has pioneered a model for corporate responsibility. We've combined philanthropic capital, research, our employees' expertise, policy recommendations and advocacy before every level of government. This integrated approach has helped support small business owners, train workers for the jobs of today and tomorrow, empower underserved people to grow wealth, build more affordable housing, and test ways to make communities more resilient against climate change. These foundational needs remain critical.

As a central pillar of the firm's $30 billion racial equity commitment, our work to improve housing affordability and stability — especially for households of color — exemplifies this approach.

Research from the JPMorgan Chase Institute put a spotlight on the pandemic's unequal impact on households, including specific hardships facing renters. These insights are informing policy and practice. Guided by this data, we have committed $400 million in philanthropic capital ranging from low-cost loans and equity to affordable housing initiatives that are community-led, systemic and scalable. And we are advancing data-driven policy solutions to help break down structural inequities, including solutions to improve access to affordable mortgage products, increase housing supply in opportunity-connected neighborhoods and mitigate bias in home valuations. These efforts inform our business as the firm delivers on its goal to expand homeownership and reduce housing costs by originating and refinancing tens of thousands of additional loans for Black, Hispanic and Latino homeowners — and to finance the creation and preservation of 100,000 additional affordable rental homes in underserved communities — in the next five years.

We have learned a great deal from this multifaceted approach, in collaboration with community and government leaders. We are now leveraging this blueprint so we can continue to bring the full force of our firm in support of inclusive economies across the globe.

Long-term business success depends on collective societal success: Greater economic stability and sustained growth undermine inequality.

Helping to address the challenges of sustainable, inclusive growth is the right thing to do. It is what our customers and employees expect of us.

And it is good for business, too.

Demetrios Marantis
Global Head of Corporate Responsibility

$1T

Targeted for green initiatives that support climate action by 2030

Top 10

Ranked in the JUST 100: Companies Leading the New Era of Responsible Capitalism

$18+B

Deployed or committed toward our $30 billion racial equity commitment in 2021

$450+M

Committed in philanthropic capital globally in 2021

Bringing the full force of the firm

Helping to address the world's most pressing problems – from economic inequality and climate change to systemic racism – is a business imperative at JPMorgan Chase. We are able to deliver solutions to these challenges at scale because of the investments we have made over the years to build a strong and healthy company and serve our customers and clients.

With that foundation in place, we are combining our business resources, policy engagement, philanthropic capital, unique data and expertise to help create a stronger, more inclusive economy. We are also collaborating closely with critical stakeholders, including policymakers around the world and nonprofit organizations embedded in the fabric of their communities, to help drive innovative solutions.

The firm receives feedback and insights through long-standing relationships with key stakeholders – including civil rights organizations, consumer policy groups, nonprofits, civic leaders and trade associations – which continues to inform the development of JPMorgan Chase's products, services and business practices, including the firm's $30 billion commitment to advance racial equity.

Investing in women of color

Black and Latina women are the backbone of many of America's communities – as consumers, homeowners, entrepreneurs, business owners and essential workers in critical sectors. According to the JPMorgan Chase Institute, Black and Latina women were particularly vulnerable to the financial effects of the pandemic, experiencing the fastest depletion of their stimulus balance gains. Their economic recovery is further compounded by long-standing racial and gender wealth gaps.

Supporting the economic success of Black and Latina women is foundational to building more equitable communities. In 2021, for the first time, JPMorgan Chase's annual competition to advance equity in cities specifically sourced and supported solutions designed by and for Black and Latina women, their families and their local economies.

Accomplishments:

- We committed $30 million by 2024 to help catalyze long-term economic prosperity for Black and Latina women. As part of this $30 million commitment, we awarded $5 million grants to collaboratives across six cities – Baltimore, Los Angeles, Miami, Minneapolis-St. Paul, New Orleans and Washington, D.C.

Accelerating climate and sustainability solutions

Developing solutions to the sustainability challenges we face is critical for our planet and communities around the world. JPMorgan Chase's global reach and expertise position us well to help reduce emissions and advance climate action.

The firm is minimizing its environmental footprint while helping our clients raise capital for efforts such as building sustainable infrastructure, developing and scaling new technologies, and implementing business strategies to transition to a low-carbon economy. We are also focused on helping carbon-intensive industries strategically decarbonize and are supporting investors who seek to put their capital to work to advance these opportunities.

Accomplishments:

- The firm set a new target to finance and facilitate more than $2.5 trillion through 2030 to advance sustainable development, including $1 trillion in green initiatives that support climate action.
- JPMorgan Chase published the comprehensive steps we are taking to better align our financing activities with the climate goals of the Paris Agreement, which include 2030 portfolio-level emissions reduction targets for the oil and gas, electric power and auto manufacturing sectors.
- We released our Carbon Compass℠ methodology, which guides our approach for Paris-aligned target setting, measuring clients' carbon intensity, evaluating ongoing progress and integrating carbon performance considerations into business decision-making.
- Having achieved carbon neutrality across our operations since 2020, we set new targets to reduce the environmental impact of our physical footprint, including our buildings, branches and data centers.

Building strong careers and skills

Rapid changes in technology, automation and artificial intelligence continue to change the labor market and alter career paths. JPMorgan Chase made a five-year, $350 million commitment in 2019 to prepare people for the future of work and meet the growing demand for skilled workers around the globe. As part of this, we are building pathways and policy recommendations to help underserved students gain better access to credentials, skills, degrees and real-world work experiences.

Accomplishments:

- This commitment includes $75 million for the firm's global career readiness initiative to better prepare young people for the jobs of today and tomorrow.
- Globally, our employees dedicate their time to help young people develop the skills necessary for success through programs such as The Fellowship Initiative and Advancing Young Professionals. These programs helped prepare more than 440 young people for personal and professional success in 2021.
- JPMorgan Chase hired approximately 4,000 people with criminal backgrounds in 2021, approximately 10% of our new hires. The firm also supported Clean Slate legislation to help clear or seal eligible criminal records and open access to jobs in places such as Connecticut, Delaware and Michigan – and continues to push for measures in Colorado and New York.
- As part of the $34 million ongoing philanthropic commitment across India, the firm is helping young people pursue promising career pathways while also supporting micro-businesses and inclusive fintech solutions.

Supporting small business growth and entrepreneurship

Supporting small businesses and underserved entrepreneurs is key to lifting entire communities, yet research from the JPMorgan Chase Institute shows that Black-, Hispanic-, Latino- and women-owned small businesses are underrepresented among firms with substantial external financing, limiting opportunities to scale their businesses.

To address these disparities, we are leveraging our business activities, policy expertise and philanthropic capital to develop innovative approaches focused on expanding access to capital, expertise and networks for underserved entrepreneurs.

Accomplishments:

- In 2021, the firm made a five-year, $350 million commitment to grow Black-, Hispanic-, Latino- and women-owned small businesses. This effort is helping to improve access to capital by providing low-cost, long-term capital and technical expertise for more underserved entrepreneurs in the United States.
- The firm invested more than $100 million in Black-, Hispanic- and Latino-owned and -led minority depository institutions and community development financial institutions (CDFIs) that provide vital financial services, such as small business loans, to underserved communities.
- In 2021, we made a $42.5 million commitment to expand the Entrepreneurs of Color Fund (EOCF), a collaboration with a network of investors, foundations and CDFIs to fuel Black-, Hispanic- and Latino-owned businesses in the United States. Since 2015, EOCF has provided more than 1,500 loans and deployed more than $78 million in capital.
- We supported ADIE's organizational capacity and provided the nonprofit with technical assistance to help women from low-income neighborhoods of Greater Paris, including in Seine-Saint-Denis, to build and sustain their businesses.
- The firm committed $10 million in loan capital to the Southern Opportunity and Resilience Fund, which provides flexible, affordable capital and free business support services to small businesses and nonprofits in the South and Southeast United States to help them navigate the COVID-19 economic crisis.

Catalyzing community development

Economic opportunity has deep roots in neighborhood conditions, and many communities struggle with concentrated poverty, disinvestment and other challenges — including an ongoing affordable housing crisis that disproportionally impacts households of color.

JPMorgan Chase is helping to support opportunity-rich neighborhoods where diverse communities across income levels can live, including through access to stable affordable housing and homeownership. We are also promoting data-driven policy solutions to help improve household stability and increase the availability of and equitable access to affordable housing for both renters and homeowners.

Accomplishments:

- As part of our $30 billion racial equity commitment, we committed $400 million in philanthropic capital over five years to improve housing affordability and stability for Black, Hispanic and Latino households.
- Our $400 million commitment includes $20.4 million to 11 nonprofits working to test and scale models to improve household stability and housing affordability.
- The JPMorgan Chase *Policy*Center is supporting comprehensive, evidence-based policy reforms to improve affordable rental housing and homeownership, including expediting the execution of better targeted rental assistance, incentivizing eviction reforms that improve outcomes for tenants and landlords, and building on COVID-19 protections that support homeowners.

Expanding financial health and wealth creation

Policies and programs aimed at improving financial health — such as providing access to affordable financial services and addressing the underlying challenges that Black, Hispanic and Latino families face — are key to an inclusive economic recovery. According to research from the JPMorgan Chase Institute, the median Black family holds 32 cents and the median Latino family holds 47 cents for every dollar held in liquid assets by the median white family.

In 2019, we made a five-year, $125 million commitment to improve the financial health of underserved communities. As part of this, we are leveraging our philanthropic capital and expertise to seed and scale technology-based innovations specifically for low- and moderate-income households around the world.

Accomplishments:

- Over the past seven years, JPMorgan Chase has committed more than $40 million to the Financial Solutions Lab to help cultivate, support and scale innovative ideas that advance the financial health of low- to moderate-income consumers and historically underserved communities.
- Companies that participated in the Financial Solutions Lab have helped customers build more than $3 billion dollars in savings, avoid $420 million in fees and settle over $20 million in debt.
- The firm assists similar efforts around the globe, including the Financial Inclusion Lab, which supports fintech solutions for low-income populations across India, and the Catalyst Fund, which promotes financial resilience in emerging markets such as India, Kenya, Mexico, Nigeria and South Africa.

Employees serving our communities

Through skills-based volunteering programs, JPMorgan Chase facilitates our employees' desire to support their communities and causes that are important to them.

2021 Accomplishments:

- More than 23,000 employees volunteered over 191,000 hours. This includes 275 JPMorgan Chase Service Corps volunteers from 19 countries who contributed nearly 9,200 hours working with 44 nonprofits.
- Our career mentorship programs connected more than 1,200 employees with youth, helping to set them on the right path toward their future career endeavors.
- Our Board Service program trained and placed more than 110 employees on nonprofit boards across the United States.
- The firm and our employees donated more than $8 million to disaster relief efforts around the globe in 2021. In 2022, the firm and our employees have already donated more than $5 million to the Ukrainian humanitarian crisis.

Awards and recognition

- Ranked Top 10 in *Fortune* magazine's 2021 World's Most Admired Companies list.
- Ranked Top 10 in the JUST 100: Companies Leading the New Era of Responsible Capitalism, compiled by *Forbes* and JUST Capital.
- Recognized in *Forbes*' inaugural 2021 Green Growth 50 list.
- Recognized in *Forbes*' 2021 America's Best Employers for Veterans list.
- Earned 100% rating in the Human Rights Campaign's Corporate Equality Index 2021 — 19th consecutive year.

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Note:

The following pages from JPMorgan Chase & Co.'s 2021 Form 10-K are not included herein: 1-42, 312

THREE-YEAR SUMMARY OF CONSOLIDATED FINANCIAL HIGHLIGHTS (unaudited)

As of or for the year ended December 31, (in millions, except per share, ratio, headcount data and where otherwise noted)	2021	2020	2019
Selected income statement data			
Total net revenue[a]	$ 121,649	$ 119,951	$ 115,720
Total noninterest expense	71,343	66,656	65,269
Pre-provision profit[b]	50,306	53,295	50,451
Provision for credit losses	(9,256)	17,480	5,585
Income before income tax expense	59,562	35,815	44,866
Income tax expense[a]	11,228	6,684	8,435
Net income	$ 48,334	$ 29,131	$ 36,431
Earnings per share data			
Net income: Basic	$ 15.39	$ 8.89	$ 10.75
Diluted	15.36	8.88	10.72
Average shares: Basic	3,021.5	3,082.4	3,221.5
Diluted	3,026.6	3,087.4	3,230.4
Market and per common share data			
Market capitalization	$ 466,206	$ 387,492	$ 429,913
Common shares at period-end	2,944.1	3,049.4	3,084.0
Book value per share	88.07	81.75	75.98
Tangible book value per share (“TBVPS”)[b]	71.53	66.11	60.98
Cash dividends declared per share	3.80	3.60	3.40
Selected ratios and metrics			
Return on common equity (“ROE”)[c]	19 %	12 %	15 %
Return on tangible common equity (“ROTCE”)[b][c]	23	14	19
Return on assets (“ROA”)[b]	1.30	0.91	1.33
Overhead ratio	59	56	56
Loans-to-deposits ratio	44	47	64
Firm Liquidity coverage ratio (“LCR”) (average)[d]	111	110	116
JPMorgan Chase Bank, N.A. LCR (average)[d]	178	160	116
Common equity Tier 1 (“CET1”) capital ratio[e]	13.1	13.1	12.4
Tier 1 capital ratio[e]	15.0	15.0	14.1
Total capital ratio[e]	16.8	17.3	16.0
Tier 1 leverage ratio[e][f]	6.5	7.0	7.9
Supplementary leverage ratio (“SLR”)[e][f]	5.4 %	6.9 %	6.3 %
Selected balance sheet data (period-end)			
Trading assets	$ 433,575	$ 503,126	$ 369,687
Investment securities, net of allowance for credit losses	672,232	589,999	398,239
Loans	1,077,714	1,012,853	997,620
Total assets[a]	3,743,567	3,384,757	2,686,477
Deposits	2,462,303	2,144,257	1,562,431
Long-term debt	301,005	281,685	291,498
Common stockholders’ equity	259,289	249,291	234,337
Total stockholders’ equity	294,127	279,354	261,330
Headcount	271,025	255,351	256,981
Credit quality metrics			
Allowances for loan losses and lending-related commitments	$ 18,689	$ 30,815	$ 14,314
Allowance for loan losses to total retained loans	1.62 %	2.95 %	1.39 %
Nonperforming assets	$ 8,346	$ 10,906	$ 5,054
Net charge-offs	2,865	5,259	5,629
Net charge-off rate	0.30 %	0.55 %	0.60 %

Effective January 1, 2020, the Firm adopted the Financial Instruments – Credit Losses (“CECL”) accounting guidance. Refer to Note 1 for further information.

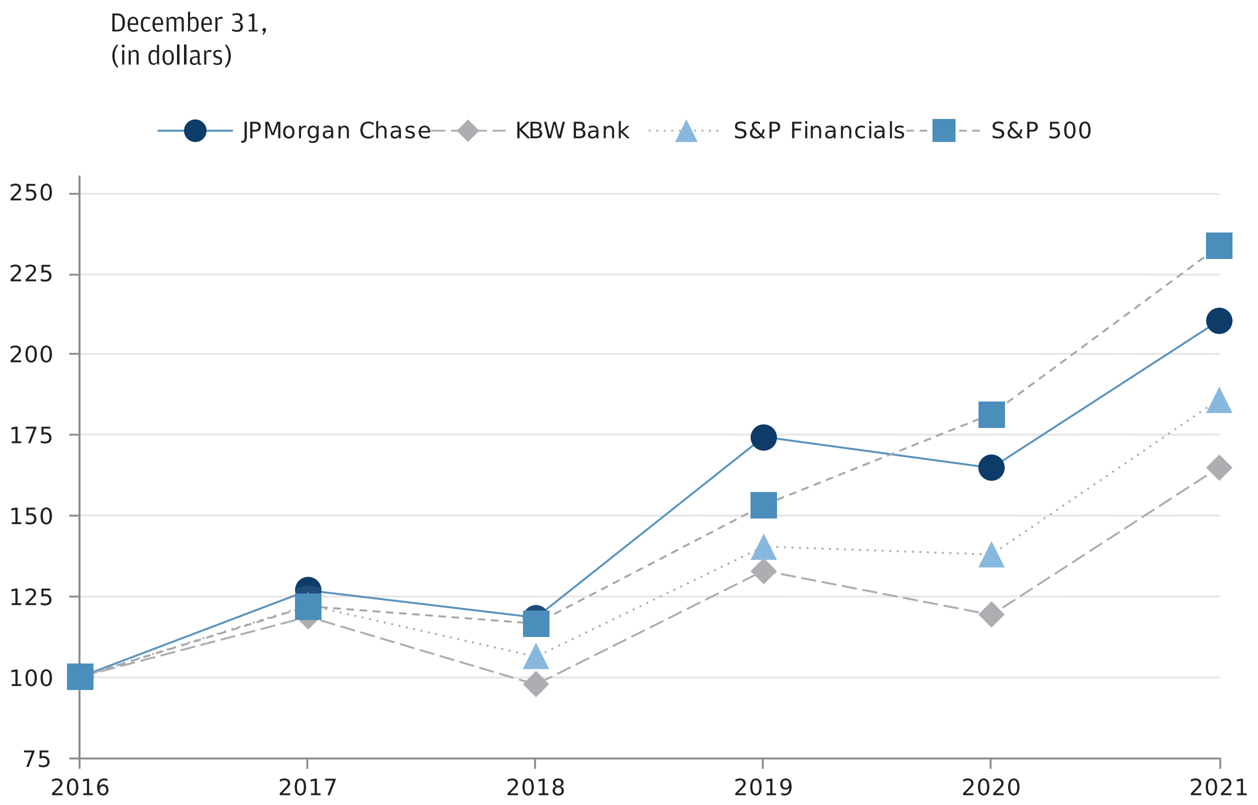
(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
(b) Pre-provision profit, TBVPS and ROTCE are each non-GAAP financial measures. Tangible common equity (“TCE”) is also a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm’s Use of Non-GAAP Financial Measures on pages 58-60 for a discussion of these measures.
(c) Quarterly ratios are based upon annualized amounts.
(d) For the years ended December 31, 2021, 2020 and 2019, the percentage represents average LCR for the three months ended December 31, 2021, 2020 and 2019. Refer to Liquidity Risk Management on pages 97-104 for additional information on the LCR results.
(e) As of December 31, 2021 and 2020, the capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the Current Expected Credit Losses ("CECL") capital transition provisions that became effective in the first quarter of 2020 and expired on December 31, 2021. As of December 31, 2020, the SLR reflected the temporary exclusions of U.S. Treasury securities and deposits at Federal Reserve Banks, which became effective April 1, 2020 and remained in effect through March 31, 2021. Refer to Capital Risk Management on pages 86-96 for additional information.
(f) For the years ended December 31, 2021, 2020 and 2019, the percentage represents average ratios for the three months ended December 31, 2021, 2020 and 2019. Refer to Capital Risk Management on pages 86-96 for additional information on the capital metrics.

FIVE-YEAR STOCK PERFORMANCE

The following table and graph compare the five-year cumulative total return for JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") common stock with the cumulative return of the S&P 500 Index, the KBW Bank Index and the S&P Financials Index. The S&P 500 Index is a commonly referenced equity benchmark in the United States of America ("U.S."), consisting of leading companies from different economic sectors. The KBW Bank Index seeks to reflect the performance of banks and thrifts that are publicly traded in the U.S. and is composed of leading national money center and regional banks and thrifts. The S&P Financials Index is an index of financial companies, all of which are components of the S&P 500. The Firm is a component of all three industry indices.

The following table and graph assume simultaneous investments of $100 on December 31, 2016, in JPMorgan Chase common stock and in each of the above indices. The comparison assumes that all dividends were reinvested.

December 31, (in dollars)	2016	2017	2018	2019	2020	**2021**
JPMorgan Chase	$ 100.00	$ 126.73	$ 118.31	$ 174.23	$ 164.62	**$ 210.26**
KBW Bank Index	100.00	118.59	97.59	132.84	119.15	**164.83**
S&P Financials Index	100.00	122.14	106.21	140.30	137.83	**185.90**
S&P 500 Index	100.00	121.82	116.47	153.13	181.29	**233.28**



Management's discussion and analysis

The following is Management's discussion and analysis of the financial condition and results of operations ("MD&A") of JPMorgan Chase for the year ended December 31, 2021. The MD&A is included in both JPMorgan Chase's Annual Report for the year ended December 31, 2021 ("Annual Report") and its Annual Report on Form 10-K for the year ended December 31, 2021 ("2021 Form 10-K") filed with the Securities and Exchange Commission ("SEC"). Refer to the Glossary of terms and acronyms on pages 305-311 for definitions of terms and acronyms used throughout the Annual Report and the 2021 Form 10-K.

This Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management, speak only as of the date of this Form 10-K and are subject to significant risks and uncertainties. Refer to Forward-looking Statements on page 155 and Part 1, Item 1A: Risk factors in the 2021 Form 10-K on pages 9-33 for a discussion of certain of those risks and uncertainties and the factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties. There is no assurance that actual results will be in line with any outlook information set forth herein, and the Firm does not undertake to update any forward-looking statements.

INTRODUCTION

JPMorgan Chase & Co. (NYSE: JPM), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the United States of America ("U.S."), with operations worldwide. JPMorgan Chase had $3.7 trillion in assets and $294.1 billion in stockholders' equity as of December 31, 2021. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers, predominantly in the U.S., and many of the world's most prominent corporate, institutional and government clients globally.

JPMorgan Chase's principal bank subsidiary is JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), a national banking association with U.S. branches in 48 states and Washington, D.C. as of December 31, 2021. JPMorgan Chase's principal nonbank subsidiary is J.P. Morgan Securities LLC ("J.P. Morgan Securities"), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm's principal operating subsidiary outside the U.S. is J.P. Morgan Securities plc, a U.K.-based subsidiary of JPMorgan Chase Bank, N.A.

For management reporting purposes, the Firm's activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm's consumer business is the Consumer & Community Banking ("CCB") segment. The Firm's wholesale business segments are the Corporate & Investment Bank ("CIB"), Commercial Banking ("CB"), and Asset & Wealth Management ("AWM"). Refer to Business Segment Results on pages 61-80, and Note 32 for a description of the Firm's business segments, and the products and services they provide to their respective client bases.

The Firm's website is www.jpmorganchase.com. JPMorgan Chase makes available on its website, free of charge, annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as soon as reasonably practicable after it electronically files or furnishes such material to the U.S. Securities and Exchange Commission (the "SEC") at www.sec.gov. JPMorgan Chase makes new and important information about the Firm available on its website at https://www.jpmorganchase.com, including on the Investor Relations section of its website at https://www.jpmorganchase.com/ir. Information on the Firm's website is not incorporated by reference into this 2021 Form 10-K or the Firm's other filings with the SEC.

This executive overview of the MD&A highlights selected information and does not contain all of the information that is important to readers of this 2021 Form 10-K. For a complete description of the trends and uncertainties, as well as the risks and critical accounting estimates, affecting the Firm, this 2021 Form 10-K should be read in its entirety.

Financial performance of JPMorgan Chase

Year ended December 31, (in millions, except per share data and ratios)	2021	2020	Change
Selected income statement data			
Total net revenue[(a)]	**$121,649**	$119,951	1 %
Total noninterest expense	**71,343**	66,656	7
Pre-provision profit	**50,306**	53,295	(6)
Provision for credit losses	**(9,256)**	17,480	NM
Net income	**48,334**	29,131	66
Diluted earnings per share	**15.36**	8.88	73
Selected ratios and metrics			
Return on common equity	**19 %**	12 %	
Return on tangible common equity	**23**	14	
Book value per share	**$ 88.07**	$ 81.75	8
Tangible book value per share	**71.53**	66.11	8
Capital ratios[(b)]			
CET1 capital	**13.1 %**	**13.1 %**	
Tier 1 capital	**15.0**	**15.0**	
Total capital	**16.8**	**17.3**	

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.
(b) The capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the CECL capital transition provisions that became effective in the first quarter of 2020 and expired on December 31, 2021. Refer to Capital Risk Management on pages 86-96 for additional information.

Comparisons noted in the sections below are for the full year of 2021 versus the full year of 2020, unless otherwise specified.

Firmwide overview

JPMorgan Chase reported net income of $48.3 billion for 2021, or $15.36 per share, on net revenue of $121.6 billion. The Firm reported ROE of 19% and ROTCE of 23%. The Firm's results for 2021 included a reduction in the allowance for credit losses of $12.1 billion.

- The Firm had net income of $48.3 billion, up 66%, driven by a net benefit in the provision for credit losses, compared to an expense recorded in the prior year.
- Total net revenue was up 1%.
  - Noninterest revenue was $69.3 billion, up 6%, driven by higher Investment Banking fees and asset management fees, partially offset by lower CIB Markets revenue.
  - Net interest income was $52.3 billion, down 4%, driven by the impact of lower market rates and changes in the balance sheet mix, partially offset by balance sheet growth.
- Noninterest expense was $71.3 billion, up 7%, predominantly driven by higher compensation expense and continued investments in the business, including technology.
- The provision for credit losses was a net benefit of $9.3 billion, driven by;
  - a $12.1 billion reduction in the allowance for credit losses primarily reflecting improvements in the Firm's macroeconomic outlook, and
  - $2.9 billion of net charge-offs predominantly driven by Card

  The prior year provision was an expense of $17.5 billion, reflecting a net addition to the allowance for credit losses of $12.2 billion, and $5.3 billion of net charge-offs.
- The total allowance for credit losses was $18.7 billion at December 31, 2021. The Firm had an allowance for loan losses to retained loans coverage ratio of 1.62%, compared with 2.95% in the prior year; the decrease from the prior year was driven by reductions in the allowance for credit losses.
- The Firm's nonperforming assets totaled $8.3 billion at December 31, 2021, a decrease of $2.6 billion from the prior year, driven by lower nonaccrual loans, reflecting the impact of net portfolio activity and client-specific upgrades in wholesale, as well as improved credit performance in consumer; and lower loans at fair value in the CIB consumer portfolio, largely due to sales.
- Firmwide average loans of $1.0 trillion were up 3%, driven by higher loans in AWM and CIB, partially offset by lower loans in CCB and CB.
- Firmwide average deposits of $2.3 trillion were up 23%, reflecting significant inflows across the LOBs, primarily driven by the effect of certain government actions in response to the COVID-19 pandemic, as well as growth from existing and new accounts in CCB.

Selected capital-related metrics

- The Firm's CET1 capital was $214 billion, and the Standardized and Advanced CET1 ratios were 13.1% and 13.8%, respectively.
- The Firm's SLR was 5.4%.
- The Firm grew TBVPS, ending 2021 at $71.53, up 8% versus the prior year.

Pre-provision profit, ROTCE, TCE and TBVPS are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60, and Capital Risk Management on pages 86-96 for a discussion of each of these measures.

Business segment highlights

Selected business metrics for each of the Firm's four LOBs are presented below for the full year of 2021.

CCB ROE 41%	• Average deposits up 24%; client investment assets up 22% • Average loans down 3%; Card net charge-off rate of 1.94% • Debit and credit card sales volume[(a)] up 26% • Active mobile customers up 11%
CIB ROE 25%	• $13.4 billion of Global Investment Banking fees, up 41% • #1 ranking for Global Investment Banking fees with 9.5% wallet share for the year • Total Markets revenue of $27.4 billion, down 7%, with Fixed Income Markets down 19% and Equity Markets up 22%
CB ROE 21%	• Gross Investment Banking revenue of $5.1 billion, up 52% • Average deposits up 27%; average loans down 6%
AWM ROE 33%	• Assets under management (AUM) of $3.1 trillion, up 15% • Average deposits up 42%; average loans up 19%

(a) Excludes Commercial Card

Refer to the Business Segment Results on pages 61-62 for a detailed discussion of results by business segment.

Credit provided and capital raised

JPMorgan Chase continues to support consumers, businesses and communities around the globe. The Firm provided new and renewed credit and raised capital for wholesale and consumer clients during 2021, consisting of:

$3.2 trillion	Total credit provided and capital raised (including loans and commitments)[(a)]
$331 billion	Credit for consumers
$22 billion	Credit for U.S. small businesses
$1.3 trillion	Credit for corporations
$1.5 trillion	Capital raised for corporate clients and non-U.S. government entities
$63 billion	Credit and capital raised for nonprofit and U.S. government entities[(b)]
$11 billion	Loans under the Small Business Administration's Paycheck Protection Program

(a) Excludes loans under the SBA's PPP.
(b) Includes states, municipalities, hospitals and universities.

Recent events

- On January 25, 2022, JPMorgan Chase announced that it entered into an agreement with Viva Wallet Holdings Software Development S.A. to acquire an ownership stake of approximately 49% in the cloud-based payments financial technology company, subject to regulatory approvals.
- On January 24, 2022, JPMorgan Chase announced that it has merged three of its EU credit institution subsidiaries into a single subsidiary, J.P. Morgan SE, which is headquartered in Germany and has a branch network across the European Economic Area, as well as a branch in London.
- On January 1, 2022, Daniel Pinto became the sole President and Chief Operating Officer of JPMorgan Chase after the retirement of Gordon Smith at the end of 2021. Mr. Pinto continues to serve as the CEO of CIB, and the CEOs of the other LOBs report jointly to Mr. Pinto and Jamie Dimon, Chairman and CEO of the Firm.

2022 outlook

These current expectations are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. Refer to Forward-Looking Statements on page 155, and the Risk Factors section on pages 9-33 of the Firm's 2021 Form 10-K, for a further discussion of certain of those risks and uncertainties and the other factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties. There is no assurance that actual results in 2022 will be in line with the outlook information set forth below, and the Firm does not undertake to update any forward-looking statements.

JPMorgan Chase's current outlook for 2022 should be viewed against the backdrop of the global and U.S. economies, the COVID-19 pandemic, financial markets activity, the geopolitical environment, the competitive environment, client and customer activity levels, and regulatory and legislative developments in the U.S. and other countries where the Firm does business. Each of these factors will affect the performance of the Firm and its LOBs. The Firm will continue to make appropriate adjustments to its businesses and operations in response to ongoing developments in the business, economic, regulatory and legal environments in which it operates. The outlook information contained in this Form 10-K supersedes all outlook information provided by the Firm in its periodic reports furnished to or filed with the SEC prior to the date of this Form 10-K.

Full-year 2022

- Management expects net interest income on a managed basis, excluding CIB Markets, to be in excess of $53 billion, market dependent.
- Management expects adjusted expense to be approximately $77 billion, which includes increased investments in technology, distribution and marketing, and higher structural expense.

Net interest income on a managed basis, excluding CIB Markets, and adjusted expense are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60.

Business Developments

COVID-19 Pandemic

As the COVID-19 pandemic has continued to evolve, the Firm has remained focused on serving its clients, customers and communities, as well as the well-being of its employees. The Firm continues to actively monitor and adapt to health and safety developments at local and regional levels as more of its global workforce returns to the office.

For information on the impact of U.S. government actions and programs in response to the COVID-19 pandemic, refer to:

- Credit Portfolio on page 109 for information on PPP,
- Consumer Credit Portfolio on page 112 and Wholesale Credit Portfolio on page 118 for information on retained loans under payment deferral, and
- Note 12 on page 231 for information on the Firm's loan modification activities.

Interbank Offered Rate ("IBOR") transition

JPMorgan Chase and other market participants continue to make progress with respect to the transition from the use of the London Interbank Offered Rate ("LIBOR") and other IBORs to comply with the International Organization of Securities Commission's standards for transaction-based benchmark rates. As of January 1, 2022, ICE Benchmark Administration ceased the publication of all tenors of LIBOR for U.K. sterling, Japanese yen, Swiss franc and Euro LIBOR (collectively, "non-U.S. dollar LIBOR") and the one-week and two-month tenors of U.S. dollar LIBOR. The cessation of the publication of the principal tenors of U.S. dollar LIBOR (i.e., overnight, one-month, three-month, six-month and 12-month LIBOR) is scheduled for June 30, 2023.

In joint statements issued by the Federal Reserve, the OCC and the FDIC, the banking regulators encouraged U.S. banks to cease entering into new contracts that use U.S. dollar LIBOR as a reference rate by December 31, 2021. The Firm has ceased executing contracts that reference U.S. dollar LIBOR, with certain permissible limited exceptions, and now offers various floating rate products, and provides and arranges various types of floating rate debt financings, across its businesses that reference replacement rates, including the Secured Overnight Financing Rate ("SOFR"). The Firm continues to engage with clients in relation to the transition from the principal tenors of U.S. dollar LIBOR and to support clients as they move to replacement rates.

On November 16, 2021 the Financial Conduct Authority ("FCA") confirmed that it will allow, for a period of at least one year, the use of "synthetic" U.K. sterling and Japanese yen LIBOR rates in all legacy LIBOR contracts, other than cleared derivatives, that had not been transitioned to replacement rates by January 1, 2022. The use of these synthetic LIBORs, will allow market participants additional time to complete their transition to replacement rates or otherwise to reduce their exposure to contracts that do not have robust fallback mechanisms and that are difficult to amend.

During the fourth quarter of 2021, the principal central counterparties ("CCPs") converted cleared derivatives contracts linked to non-U.S. dollar LIBOR to replacement rates before the cessation of the publication of those LIBORs on December 31, 2021.

The Firm has made significant progress towards reducing its exposure to IBOR-referencing contracts, including in derivatives, bilateral and syndicated loans, securities, and debt and preferred stock issuances, and is on-track to meet its internal milestones for contract remediation as well as the industry milestones and recommendations published by National Working Groups, including the Alternative Reference Rates Committee in the U.S.

In connection with the transition from LIBOR, as of December 31, 2021 the Firm had remediated substantially all of the notional amount of its bilateral derivatives contracts linked to U.S. dollar LIBOR and non-U.S. dollar

LIBOR, and substantially all of its non-U.S. dollar LIBOR-linked loans. The Firm continues its client outreach with respect to U.S. dollar LIBOR-linked loans.

The Firm is also on schedule to implement further necessary changes to risk management systems in order to transition from LIBOR, including modifications to its operational systems and models. In 2021, the Firm changed the rate basis of its transfer pricing methodology for U.S. dollar-denominated contracts to SOFR and implemented internal controls to restrict the use of LIBOR in new transactions.

Legislation intended to reduce the likelihood of disputes arising from the cessation of LIBOR has been adopted or proposed in certain jurisdictions. The Firm continues to review the extent to which these legislative actions or proposals, if enacted, may reduce the risk of litigation and disputes arising from the transition from LIBOR.

The Firm continues to monitor and evaluate client, industry, market, regulatory and legislative developments, including the transition relief issued by the Internal Revenue Service and U.S. Treasury Department in January 2022 with respect to the tax implications of reference rate reform.

CONSOLIDATED RESULTS OF OPERATIONS

This section provides a comparative discussion of JPMorgan Chase's Consolidated Results of Operations on a reported basis for the two-year period ended December 31, 2021, unless otherwise specified. Refer to Consolidated Results of Operations on pages 54-56 of the Firm's Annual Report on Form 10-K for the year ended December 31, 2020 (the "2020 Form 10-K") for a discussion of the 2020 versus 2019 results. Factors that relate primarily to a single business segment are discussed in more detail within that business segment's results. Refer to pages 150-153 for a discussion of the Critical Accounting Estimates Used by the Firm that affect the Consolidated Results of Operations.

Revenue

Year ended December 31, (in millions)	2021	2020	2019
Investment banking fees	**$ 13,216**	$ 9,486	$ 7,501
Principal transactions	**16,304**	18,021	14,018
Lending- and deposit-related fees	**7,032**	6,511	6,626
Asset management, administration and commissions	**21,029**	18,177	16,908
Investment securities gains/(losses)	**(345)**	802	258
Mortgage fees and related income	**2,170**	3,091	2,036
Card income	**5,102**	4,435	5,076
Other income[(a)(b)]	**4,830**	4,865	6,052
Noninterest revenue	**69,338**	65,388	58,475
Net interest income	**52,311**	54,563	57,245
Total net revenue	**$ 121,649**	$ 119,951	$ 115,720

(a) Included operating lease income of $4.9 billion, for the year ended December 31, 2021, and $5.5 billion for each of the years ended December 31, 2020 and 2019.
(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

2021 compared with 2020

Investment banking fees increased across products in CIB, reflecting:

- higher advisory fees driven by increased M&A activity and wallet share gains
- higher equity underwriting fees due to a strong IPO market and wallet share gains, and
- higher debt underwriting fees predominantly driven by an active leveraged loan market primarily related to acquisition financing.

Refer to CIB segment results on pages 67-72 and Note 6 for additional information.

Principal transactions revenue decreased, reflecting:

- lower revenue in CIB Fixed Income Markets, primarily in Rates, Currencies & Emerging Markets, Credit and Commodities, compared to a strong prior year, and an increase in Securitized Products, and
- lower net valuation gains on several legacy equity investments in Corporate,

partially offset by

- higher revenue in CIB Equity Markets driven by strong performance across derivatives, prime brokerage, and Cash Equities
- favorable results in CIB's Credit Adjustments & Other, with a net gain of $250 million predominantly driven by valuation adjustments related to derivatives, compared with a $29 million net loss in the prior year, and
- the absence of losses recorded in the prior year in Treasury and CIO related to cash deployment transactions, which were more than offset by the related net interest income earned on these transactions, also in the prior year.

Refer to CIB and Corporate segment results on pages 67-72 and pages 79-80, respectively, and Note 6 for additional information.

Lending- and deposit-related fees increased as a result of:

- higher cash management fees in CIB and CB, and higher lending-related fees, particularly loan commitment fees in CIB,

predominantly offset by

- lower overdraft fee revenue in CCB.

Refer to CCB, CIB and CB segment results on pages 63-66, pages 67-72 and pages 73-75, respectively, and Note 6 for additional information.

Asset management, administration and commissions revenue increased driven by:

- higher asset management fees in AWM and CCB as a result of higher average market levels and net inflows, and
- higher custody fees in CIB Securities Services, primarily associated with higher assets under custody.

Refer to CCB, CIB and AWM segment results on pages 63-66, pages 67-72 and pages 76-78, respectively, and Note 6 for additional information.

Investment securities gains/(losses) reflected net losses related to repositioning the investment securities portfolio, compared with net gains in the prior year from sales of U.S. GSE and government agency MBS. Refer to Corporate segment results on pages 79-80 and Note 10 for additional information.

Mortgage fees and related income decreased due to:

- lower net mortgage servicing revenue, reflecting a net loss in MSR risk management results primarily driven by updates to model inputs related to prepayment expectations, and
- lower mortgage production revenue on lower production margins.

Refer to CCB segment results on pages 63-66, Note 6 and 15 for further information.

Card income increased due to:

- higher net interchange income in CCB driven by an increase in debit and credit card sales volume above pre-pandemic levels, partially offset by the impact of a renegotiation of a co-brand partner contract, as well as an increase to the rewards liability, and

- higher payments revenue related to commercial card and merchant processing in CB and CIB on higher volume,

partially offset by

- higher amortization related to new account origination costs in CCB.

Refer to CCB, CIB and CB segment results on pages 63-66, pages 67-72 and pages 73-75, respectively, and Note 6 for further information.

Other income decreased reflecting:

- lower auto operating lease income in CCB as a result of a decline in volume, and
- increased amortization on a higher level of alternative energy investments in the tax-oriented investment portfolio in CIB. The increased amortization was more than offset by lower income tax expense from the associated tax credits,

predominantly offset by

- net gains on several investments, primarily in CIB and AWM, and
- the absence of losses recorded in the prior year related to the early termination of certain of the Firm's long-term debt in Treasury and CIO.

Net interest income decreased driven by the impact of lower market rates and changes in the balance sheet mix, partially offset by balance sheet growth.

The Firm's average interest-earning assets were $3.2 trillion, up $436 billion, predominantly driven by higher deposits with banks and investment securities, and the yield was 1.81%, down 53 basis points ("bps"). The net yield on these assets, on an FTE basis, was 1.64%, a decrease of 34 bps. The net yield excluding CIB Markets was 1.91%, down 39 bps.

Net yield excluding CIB Markets is a non-GAAP financial measure. Refer to the Consolidated average balance sheets, interest and rates schedule on pages 300-304 for further details; and the Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for a further discussion of Net interest yield excluding CIB Markets.

Provision for credit losses

Year ended December 31, (in millions)	2021	2020	2019
Consumer, excluding credit card	$ (1,933)	$ 1,016	$ (378)
Credit card	(4,838)	10,886	5,348
Total consumer	(6,771)	11,902	4,970
Wholesale	(2,449)	5,510	615
Investment securities	(36)	68	NA
Total provision for credit losses	$ (9,256)	$ 17,480	$ 5,585

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

2021 compared with 2020

The **provision for credit losses** was a net benefit driven by net reductions in the allowance for credit losses.

The net benefit in **consumer** was driven by:

- a $9.5 billion reduction in the allowance for credit losses, reflecting improvements in the Firm's macroeconomic outlook, including $7.6 billion in Card, and $1.2 billion in Home Lending, which also reflects continued improvements in Home Price Index ("HPI") expectations, and
- lower net charge-offs predominantly in Card, as consumer cash balances remained elevated;
- the prior year included a $7.4 billion net addition to the allowance for credit losses.

The net benefit in **wholesale** was due to a net reduction of $2.6 billion in the allowance for credit losses across the LOBs, reflecting improvements in the Firm's macroeconomic outlook. The prior year included a $4.7 billion net addition to the allowance for credit losses.

Refer to the segment discussions of CCB on pages 63-66, CIB on pages 67-72, CB on pages 73-75, AWM on pages 76-78, the Allowance for Credit Losses on pages 129-131, and Notes 1, 10 and 13 for further discussion of the credit portfolio and the allowance for credit losses.

Noninterest expense

Year ended December 31, (in millions)	2021	2020	2019
Compensation expense	**$ 38,567**	$ 34,988	$ 34,155
Noncompensation expense:			
Occupancy	**4,516**	4,449	4,322
Technology, communications and equipment[a]	**9,941**	10,338	9,821
Professional and outside services	**9,814**	8,464	8,533
Marketing	**3,036**	2,476	3,351
Other[b]	**5,469**	5,941	5,087
Total noncompensation expense	**32,776**	31,668	31,114
Total noninterest expense	**$ 71,343**	$ 66,656	$ 65,269

(a) Includes depreciation expense associated with auto operating lease assets.
(b) Included Firmwide legal expense of $426 million, $1.1 billion and $239 million for the years ended December 31, 2021, 2020 and 2019, respectively.

2021 compared with 2020

Compensation expense increased across the LOBs and Corporate, primarily from higher volume- and revenue-related expense, as well as the impact of investments in the businesses.

Noncompensation expense increased as a result of:

- higher volume-related expense, including outside services, predominantly brokerage expense in CIB and distribution fees in AWM
- higher marketing expense predominantly driven by higher investments in marketing campaigns and growth in travel-related benefits in CCB
- higher other investments, including technology expense across the LOBs
- higher contribution expense, which included a $550 million donation of equity investments to the Firm's Foundation in the first quarter of 2021, and
- higher other structural expense, including regulatory-related expense,

partially offset by

- lower depreciation expense in CCB due to lower auto lease assets and the impact of higher vehicle collateral values
- lower legal expense, driven by CIB and AWM, and
- the absence of an impairment recorded in the prior year on a legacy investment in Corporate.

Income tax expense

Year ended December 31, (in millions, except rate)	2021	2020	2019
Income before income tax expense	**$59,562**	$35,815	$44,866
Income tax expense[a]	**11,228**	6,684	8,435
Effective tax rate[a]	**18.9 %**	18.7 %	18.8 %

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

2021 compared with 2020

The **effective tax rate** was relatively flat as the settlement of tax audits was largely offset by changes in the level and mix of income and expenses subject to U.S. federal, and state and local taxes. Refer to Note 25 for further information.

Consolidated balance sheets analysis

The following is a discussion of the significant changes between December 31, 2021 and 2020.

Selected Consolidated balance sheets data

December 31, (in millions)	2021	2020	Change
Assets			
Cash and due from banks	$ 26,438	$ 24,874	6 %
Deposits with banks	714,396	502,735	42
Federal funds sold and securities purchased under resale agreements	261,698	296,284	(12)
Securities borrowed	206,071	160,635	28
Trading assets	433,575	503,126	(14)
Available-for-sale securities	308,525	388,178	(21)
Held-to-maturity securities, net of allowance for credit losses	363,707	201,821	80
Investment securities, net of allowance for credit losses	672,232	589,999	14
Loans	1,077,714	1,012,853	6
Allowance for loan losses	(16,386)	(28,328)	(42)
Loans, net of allowance for loan losses	1,061,328	984,525	8
Accrued interest and accounts receivable	102,570	90,503	13
Premises and equipment	27,070	27,109	–
Goodwill, MSRs and other intangible assets	56,691	53,428	6
Other assets[(a)]	181,498	151,539	20
Total assets	$ 3,743,567	$ 3,384,757	11 %

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Cash and due from banks and deposits with banks increased primarily as a result of the continued growth in deposits and limited deployment opportunities in Treasury and CIO. Deposits with banks reflect the Firm's placements of its excess cash with various central banks, including the Federal Reserve Banks.

Federal funds sold and securities purchased under resale agreements decreased driven by:

- lower deployment of funds in Treasury and CIO, and lower client-driven market-making activities in CIB Markets,

partially offset by

- higher collateral requirements in CIB Markets.

Securities borrowed increased reflecting higher client-driven activities and an increase in the demand for securities to cover short positions in CIB Markets.

Refer to Note 11 for additional information on securities purchased under resale agreements and securities borrowed.

Trading assets decreased reflecting;

- a lower level of securities, primarily debt instruments related to client-driven market-making activities in CIB Fixed Income Markets
- lower derivative receivables, primarily as a result of market movements, as well as maturities of certain trades in CIB, and
- lower deployment of funds in Treasury and CIO.

Refer to Notes 2 and 5 for additional information.

Investment securities increased due to the net impact of purchases and paydowns in the available-for-sale ("AFS") and held-to-maturity ("HTM") portfolios, largely offset by sales in the AFS portfolio. In the second quarter of 2021, $104.5 billion of AFS were transferred to the HTM portfolio for capital management purposes. Refer to Corporate segment results on pages 79-80, Investment Portfolio Risk Management on page 132 and Notes 2 and 10 for additional information on investment securities.

Loans increased, reflecting:

- higher secured lending in CIB Markets; continued strength in securities-based lending, custom lending and mortgages in AWM; and growth in Card,

partially offset by

- a decline in CBB and CB due to the net impact of PPP loan forgiveness and loan originations, and
- lower retained residential real estate loans in Home Lending primarily due to net paydowns.

The allowance for loan losses decreased primarily as a result of improvements in the macroeconomic environment. The decline in the allowance consisted of:

- a $9.4 billion reduction in consumer, reflecting improvements in the Firm's macroeconomic outlook, predominantly in the credit card and residential real estate portfolios. The residential real estate portfolio also reflects continued improvements in HPI expectations, and
- a $2.5 billion net reduction in wholesale, across the LOBs, reflecting improvements in the Firm's macroeconomic outlook.

There was a $148 million net reduction in the allowance for lending-related commitments, driven by both wholesale and consumer. This allowance is included in other liabilities on the consolidated balance sheets. The total net reduction in the allowance for credit losses was $12.1 billion, as of December 31, 2021.

Refer to Credit and Investment Risk Management on pages 106-132, and Notes 1, 2, 3, 12 and 13 for further discussion of loans and the allowance for loan losses.

Accrued interest and accounts receivable increased due to higher client receivables related to client-driven activities primarily in CIB prime brokerage.

Refer to Note 16 and 18 for additional information on **Premises and equipment.**

Goodwill, MSRs and other intangibles increased reflecting:

- higher MSRs as a result of net additions, partially offset by the realization of expected cash flows; and
- an increase in Goodwill as a result of the acquisitions of Nutmeg, OpenInvest, Frank, The Infatuation and Campbell Global.

Refer to Note 15 for additional information.

Other assets increased due to the higher cash collateral placed with central counterparties ("CCPs") in CIB, and higher tax receivables.

Selected Consolidated balance sheets data

December 31, (in millions)	2021	2020	Change
Liabilities			
Deposits	$ 2,462,303	$ 2,144,257	15
Federal funds purchased and securities loaned or sold under repurchase agreements	194,340	215,209	(10)
Short-term borrowings	53,594	45,208	19
Trading liabilities	164,693	170,181	(3)
Accounts payable and other liabilities[(a)]	262,755	231,285	14
Beneficial interests issued by consolidated variable interest entities ("VIEs")	10,750	17,578	(39)
Long-term debt	301,005	281,685	7
Total liabilities	3,449,440	3,105,403	11
Stockholders' equity	294,127	279,354	5
Total liabilities and stockholders' equity	$ 3,743,567	$ 3,384,757	11 %

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Deposits increased across the LOBs primarily driven by the effect of certain government actions in response to the COVID-19 pandemic. In CCB, the increase was also driven by growth from new and existing accounts across both consumer and small business customers.

Refer to Liquidity Risk Management on pages 97-104; and Notes 2 and 17 for more information.

Federal funds purchased and securities loaned or sold under repurchase agreements decreased due to lower secured financing of AFS investment securities in Treasury and CIO, and trading assets in CIB Markets. Refer to Liquidity Risk Management on pages 97-104 and Note 11 for additional information.

Short-term borrowings increased as a result of higher financing of CIB Markets activities, as well as higher issuances of commercial paper in Treasury and CIO. Refer to Liquidity Risk Management on pages 97-104 for additional information.

Refer to Notes 2 and 5 for information on **trading liabilities.**

Accounts payable and other liabilities increased reflecting higher client payables related to client-driven activities primarily in CIB prime brokerage. Refer to Note 19 for additional information.

Beneficial interests issued by consolidated VIEs decreased driven by lower issuances of commercial paper as a result of lower loans in the Firm-administered multi-seller conduits in CIB, as well as maturities of credit card securitizations in Treasury and CIO.

Refer to Liquidity Risk Management on pages 97-104; and Notes 14 and 28 for additional information on Firm-sponsored VIEs and loan securitization trusts.

Long-term debt increased driven by net issuances, partially offset by fair value hedge accounting adjustments related to higher rates, and maturities of Federal Home Loan Bank ("FHLB") advances. Refer to Liquidity Risk Management on pages 97-104 and Note 20 for additional information.

Stockholders' equity increased reflecting net income, partially offset by the net impact of capital actions, and a decrease in accumulated other comprehensive income ("AOCI"). The decrease in AOCI was primarily driven by the impact of higher rates on the AFS securities portfolio and cash flow hedges. Refer to page 163 for information on changes in stockholders' equity, and Capital actions on page 94, Note 24 for additional information on AOCI.

Consolidated cash flows analysis

The following is a discussion of cash flow activities during the years ended December 31, 2021 and 2020. Refer to Consolidated cash flows analysis on page 59 of the Firm's 2020 Form 10-K for a discussion of the 2019 activities.

	Year ended December 31,		
(in millions)	**2021**	2020	2019
Net cash provided by/(used in)			
Operating activities	**$ 78,084**	$ (79,910)	$ 4,092
Investing activities	**(129,344)**	(261,912)	(52,059)
Financing activities	**275,993**	596,645	32,987
Effect of exchange rate changes on cash	**(11,508)**	9,155	(182)
Net increase/(decrease) in cash and due from banks and deposits with banks	**$ 213,225**	$ 263,978	$ (15,162)

Operating activities

JPMorgan Chase's operating assets and liabilities primarily support the Firm's lending and capital markets activities. These assets and liabilities can vary significantly in the normal course of business due to the amount and timing of cash flows, which are affected by client-driven and risk management activities and market conditions. The Firm believes that cash flows from operations, available cash and other liquidity sources, and its capacity to generate cash through secured and unsecured sources, are sufficient to meet its operating liquidity needs.

- In 2021, cash provided resulted from lower trading assets and higher accounts payable and other liabilities, partially offset by higher securities borrowed and lower trading liabilities.
- In 2020, cash used primarily reflected higher trading assets, other assets, and securities borrowed, partially offset by higher trading liabilities and net income excluding noncash adjustments.

Investing activities

The Firm's investing activities predominantly include originating held-for-investment loans and investing in the investment securities portfolio, and other short-term instruments.

- In 2021, cash used resulted from net purchases of investment securities and higher net originations of loans, partially offset by lower securities purchased under resale agreements.
- In 2020, cash used primarily reflected net purchases of investment securities, higher net originations of loans, and higher securities purchased under resale agreements.

Financing activities

The Firm's financing activities include acquiring customer deposits and issuing long-term debt and preferred stock.

- In 2021, cash provided reflected higher deposits and net proceeds from long- and short-term borrowings, partially offset by a decrease in securities loaned or sold under repurchase agreements.
- In 2020, cash provided reflected higher deposits and an increase in securities loaned or sold under repurchase agreements, partially offset by net payments of long-term borrowings.
- For both periods, cash was used for repurchases of common stock and cash dividends on common and preferred stock.

* * *

Refer to Consolidated Balance Sheets Analysis on pages 55-56, Capital Risk Management on pages 86-96, and Liquidity Risk Management on pages 97-104 for a further discussion of the activities affecting the Firm's cash flows.

EXPLANATION AND RECONCILIATION OF THE FIRM'S USE OF NON-GAAP FINANCIAL MEASURES

Non-GAAP financial measures

The Firm prepares its Consolidated Financial Statements in accordance with U.S. GAAP; these financial statements appear on pages 160-164. That presentation, which is referred to as "reported" basis, provides the reader with an understanding of the Firm's results that can be tracked consistently from year-to-year and enables a comparison of the Firm's performance with the U.S. GAAP financial statements of other companies.

In addition to analyzing the Firm's results on a reported basis, management reviews Firmwide results, including the overhead ratio, on a "managed" basis; these Firmwide managed basis results are non-GAAP financial measures. The Firm also reviews the results of the LOBs on a managed basis. The Firm's definition of managed basis starts, in each case, with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. These financial measures allow management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense. These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Management also uses certain non-GAAP financial measures at the Firm and business-segment level because these other non-GAAP financial measures provide information to investors about the underlying operational performance and trends of the Firm or of the particular business segment, as the case may be, and, therefore, facilitate a comparison of the Firm or the business segment with the performance of its relevant competitors. Refer to Business Segment Results on pages 61-80 for additional information on these non-GAAP measures. Non-GAAP financial measures used by the Firm may not be comparable to similarly named non-GAAP financial measures used by other companies.

The following summary table provides a reconciliation from the Firm's reported U.S. GAAP results to managed basis.

	2021			2020			2019		
Year ended December 31, (in millions, except ratios)	Reported	Fully taxable-equivalent adjustments[b]	Managed basis	Reported	Fully taxable-equivalent adjustments[b]	Managed basis	Reported	Fully taxable-equivalent adjustments[b]	Managed basis
Other income[a]	**$ 4,830**	**$ 3,225**	**$ 8,055**	$ 4,865	$ 2,560	$ 7,425	$ 6,052	$ 2,213	$ 8,265
Total noninterest revenue	**69,338**	**3,225**	**72,563**	65,388	2,560	67,948	58,475	2,213	60,688
Net interest income	**52,311**	**430**	**52,741**	54,563	418	54,981	57,245	531	57,776
Total net revenue	**121,649**	**3,655**	**125,304**	119,951	2,978	122,929	115,720	2,744	118,464
Total noninterest expense	**71,343**	**NA**	**71,343**	66,656	NA	66,656	65,269	NA	65,269
Pre-provision profit	**50,306**	**3,655**	**53,961**	53,295	2,978	56,273	50,451	2,744	53,195
Provision for credit losses	**(9,256)**	**NA**	**(9,256)**	17,480	NA	17,480	5,585	NA	5,585
Income before income tax expense	**59,562**	**3,655**	**63,217**	35,815	2,978	38,793	44,866	2,744	47,610
Income tax expense[a]	**11,228**	**3,655**	**14,883**	6,684	2,978	9,662	8,435	2,744	11,179
Net income	**$ 48,334**	**NA**	**$ 48,334**	$ 29,131	NA	$ 29,131	$ 36,431	NA	$ 36,431
Overhead ratio[a]	**59 %**	**NM**	**57 %**	56 %	NM	54 %	56 %	NM	55 %

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
(b) Predominantly recognized in CIB, CB and Corporate.

Net interest income, net yield, and noninterest revenue excluding CIB Markets

In addition to reviewing net interest income, net yield, and noninterest revenue on a managed basis, management also reviews these metrics excluding CIB Markets, as shown below. CIB Markets consists of Fixed Income Markets and Equity Markets. These metrics, which exclude CIB Markets, are non-GAAP financial measures. Management reviews these metrics to assess the performance of the Firm's lending, investing (including asset-liability management) and deposit-raising activities, apart from any volatility associated with CIB Markets activities. In addition, management also assesses CIB Markets business performance on a total revenue basis as offsets may occur across revenue lines. Management believes that these measures provide investors and analysts with alternative measures to analyze the revenue trends of the Firm.

Year ended December 31, (in millions, except rates)	2021	2020	2019
Net interest income – reported	**$ 52,311**	$ 54,563	$ 57,245
Fully taxable-equivalent adjustments	**430**	418	531
Net interest income – managed basis[a]	**$ 52,741**	$ 54,981	$ 57,776
Less: CIB Markets net interest income[b]	**8,243**	8,374	3,120
Net interest income excluding CIB Markets[a]	**$ 44,498**	$ 46,607	$ 54,656
Average interest-earning assets	**$3,215,942**	$2,779,710	$2,345,279
Less: Average CIB Markets interest-earning assets[b]	**888,238**	751,131	672,417
Average interest-earning assets excluding CIB Markets	**$2,327,704**	$2,028,579	$1,672,862
Net yield on average interest-earning assets – managed basis	**1.64 %**	1.98 %	2.46 %
Net yield on average CIB Markets interest-earning assets[b]	**0.93**	1.11	0.46
Net yield on average interest-earning assets excluding CIB Markets	**1.91 %**	2.30 %	3.27 %
Noninterest revenue – reported	**$ 69,338**	$ 65,388	$ 58,475
Fully taxable-equivalent adjustments	**3,225**	2,560	2,213
Noninterest revenue – managed basis	**$ 72,563**	$ 67,948	60,688
Less: CIB Markets noninterest revenue	**19,151**	21,109	17,792
Noninterest revenue excluding CIB Markets	**$ 53,412**	$ 46,839	$ 42,896
Memo: CIB Markets total net revenue	**$ 27,394**	$ 29,483	$ 20,912

(a) Interest includes the effect of related hedges. Taxable-equivalent amounts are used where applicable.

(b) Refer to pages 70-71 for further information on CIB Markets.

Calculation of certain U.S. GAAP and non-GAAP financial measures

Certain U.S. GAAP and non-GAAP financial measures are calculated as follows:

Book value per share ("BVPS")
Common stockholders' equity at period-end / Common shares at period-end

Overhead ratio
Total noninterest expense / Total net revenue

ROA
Reported net income / Total average assets

ROE
Net income* / Average common stockholders' equity

ROTCE
Net income* / Average tangible common equity

TBVPS
Tangible common equity at period-end / Common shares at period-end

* Represents net income applicable to common equity

In addition, the Firm reviews other non-GAAP measures such as

- Adjusted expense, which represents noninterest expense excluding Firmwide legal expense, and
- Pre-provision profit, which represents total net revenue less total noninterest expense.

Management believes that these measures help investors understand the effect of these items on reported results and provide an alternative presentation of the Firm's performance.

The Firm also reviews the allowance for loan losses to period-end loans retained excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB's allowance coverage ratio.

TCE, ROTCE and TBVPS

TCE, ROTCE and TBVPS are each non-GAAP financial measures. TCE represents the Firm's common stockholders' equity (i.e., total stockholders' equity less preferred stock) less goodwill and identifiable intangible assets (other than MSRs), net of related deferred tax liabilities. ROTCE measures the Firm's net income applicable to common equity as a percentage of average TCE. TBVPS represents the Firm's TCE at period-end divided by common shares at period-end. TCE, ROTCE and TBVPS are utilized by the Firm, as well as investors and analysts, in assessing the Firm's use of equity.

The following summary table provides a reconciliation from the Firm's common stockholders' equity to TCE.

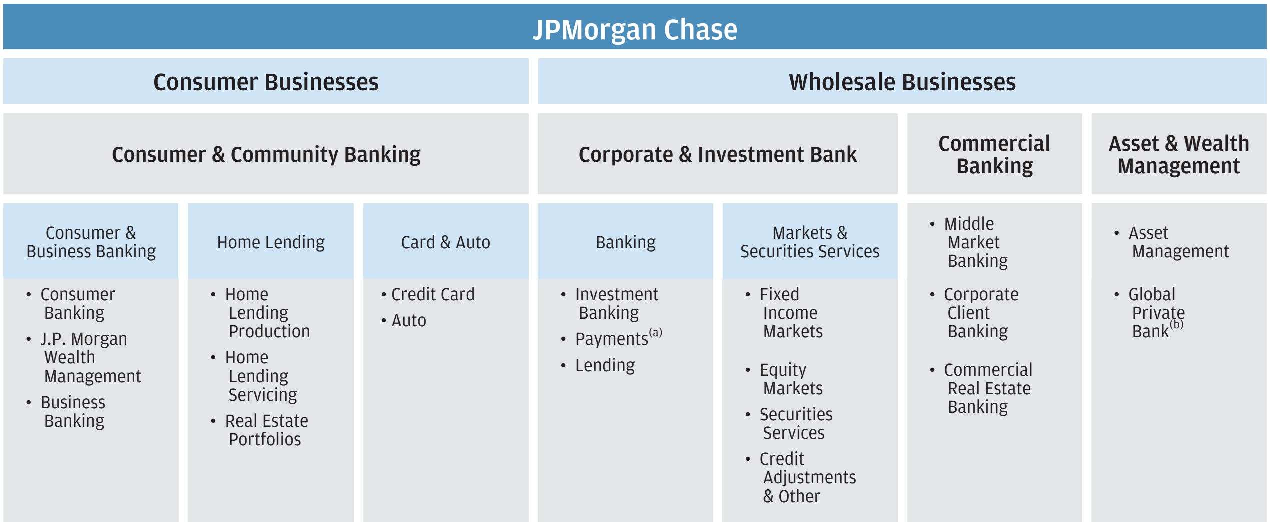
	Period-end		Average		
			Year ended December 31,		
(in millions, except per share and ratio data)	**Dec 31, 2021**	Dec 31, 2020	**2021**	2020	2019
Common stockholders' equity	**$ 259,289**	$ 249,291	**$ 250,968**	$ 236,865	$ 232,907
Less: Goodwill	**50,315**	49,248	**49,584**	47,820	47,620
Less: Other intangible assets	**882**	904	**876**	781	789
Add: Certain deferred tax liabilities[(a)]	**2,499**	2,453	**2,474**	2,399	2,328
Tangible common equity	**$ 210,591**	$ 201,592	**$ 202,982**	$ 190,663	$ 186,826
Return on tangible common equity	**NA**	NA	**23 %**	14 %	19 %
Tangible book value per share	**$ 71.53**	$ 66.11	**NA**	NA	NA

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating TCE.

BUSINESS SEGMENT RESULTS

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.

The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Explanation and Reconciliation of the Firm's use of Non-GAAP Financial Measures, on pages 58-60 for a definition of managed basis.



(a) In the fourth quarter of 2021, the Wholesale Payments business was renamed Payments.
(b) In the first quarter of 2021, the Wealth Management business was renamed Global Private Bank.

Description of business segment reporting methodology

Results of the business segments are intended to present each segment as if it were a stand-alone business. The management reporting process that derives business segment results includes the allocation of certain income and expense items. The Firm also assesses the level of capital required for each LOB on at least an annual basis. The Firm periodically assesses the assumptions, methodologies and reporting classifications used for segment reporting, and further refinements may be implemented in future periods. The Firm's LOBs also provide various business metrics which are utilized by the Firm and its investors and analysts in assessing performance.

Revenue sharing

When business segments join efforts to sell products and services to the Firm's clients, the participating business segments may agree to share revenue from those transactions. Revenue is generally recognized in the segment responsible for the related product or service, with allocations to the other segment(s) involved in the transaction. The segment results reflect these revenue-sharing agreements.

Expense Allocation

Where business segments use services provided by corporate support units, or another business segment, the costs of those services are allocated to the respective business segments. The expense is generally allocated based on the actual cost and use of services provided. In contrast, certain costs and investments related to corporate support units, technology and operations not currently utilized by any LOB, are not allocated to the business segments and are retained in Corporate. Expense retained in Corporate generally includes costs that would not be incurred if the segments were stand-alone businesses; and other items not aligned with a particular business segment.

Funds transfer pricing

Funds transfer pricing ("FTP") is the process by which the Firm allocates interest income and expense to each business segment and transfers the primary interest rate risk and liquidity risk to Treasury and CIO within Corporate.

The funds transfer pricing process considers the interest rate and liquidity risk characteristics of assets and liabilities and off-balance sheet products. Periodically the methodology and assumptions utilized in the FTP process are adjusted to reflect economic conditions and other factors, which may impact the allocation of net interest income to the business segments.

As a result of the current interest rate environment and the excess liquidity stemming from government and central bank actions since the onset of the COVID-19 pandemic, the cost of funds for assets and the credits earned for liabilities have generally declined, impacting the business segments net interest income. As such, during the period ended December 31, 2021, this has resulted in lower cost of funds for loans and margin compression on deposits across the LOBs.

Debt expense and preferred stock dividend allocation
As part of the funds transfer pricing process, almost all of the cost of the credit spread component of outstanding unsecured long-term debt and preferred stock dividends is allocated to the reportable business segments, while the balance of the cost is retained in Corporate. The methodology to allocate the cost of unsecured long-term debt and preferred stock dividends to the business segments is aligned with the relevant regulatory capital requirements, as applicable. The allocated cost of unsecured long-term debt is included in a business segment's net interest income, and net income is reduced by preferred stock dividends to arrive at a business segment's net income applicable to common equity.

Refer to Capital Risk Management on pages 86-96 for additional information.

Capital allocation
The amount of capital assigned to each segment is referred to as equity.The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. As of January 1, 2022, the Firm has changed its line of business capital allocations primarily as a result of changes in RWA for each LOB and to reflect an increase in the Firm's GSIB surcharge to 4.0% that will be effective January 1, 2023. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

Refer to Line of business equity on page 93 for additional information on capital allocation.

Segment Results – Managed Basis

The following tables summarize the Firm's results by segment for the periods indicated.

Year ended December 31,	Consumer & Community Banking			Corporate & Investment Bank			Commercial Banking		
(in millions, except ratios)	**2021**	2020	2019	**2021**	2020	2019	**2021**	2020	2019
Total net revenue	**$ 50,073**	$ 51,268	$ 55,133	**$51,749**	$ 49,284	$ 39,265	**$ 10,008**	$ 9,313	$ 9,264
Total noninterest expense	**29,256**	27,990	28,276	**25,325**	23,538	22,444	**4,041**	3,798	3,735
Pre-provision profit/(loss)	**20,817**	23,278	26,857	**26,424**	25,746	16,821	**5,967**	5,515	5,529
Provision for credit losses	**(6,989)**	12,312	4,954	**(1,174)**	2,726	277	**(947)**	2,113	296
Net income/(loss)	**20,930**	8,217	16,541	**21,134**	17,094	11,954	**5,246**	2,578	3,958
Return on equity ("ROE")	**41%**	15%	31%	**25 %**	20%	14%	**21 %**	11%	17%

Year ended December 31,	Asset & Wealth Management			Corporate			Total		
(in millions, except ratios)	**2021**	2020	2019	**2021**	2020	2019	**2021**	2020	2019
Total net revenue	**$16,957**	$ 14,240	$ 13,591	**$ (3,483)**	$ (1,176)	$ 1,211	**$ 125,304**	$ 122,929	$ 118,464
Total noninterest expense	**10,919**	9,957	9,747	**1,802**	1,373	1,067	**71,343**	66,656	65,269
Pre-provision profit/(loss)	**6,038**	4,283	3,844	**(5,285)**	(2,549)	144	**53,961**	56,273	53,195
Provision for credit losses	**(227)**	263	59	**81**	66	(1)	**(9,256)**	17,480	5,585
Net income/(loss)	**4,737**	2,992	2,867	**(3,713)**	(1,750)	1,111	**48,334**	29,131	36,431
Return on equity ("ROE")	**33 %**	28%	26%	**NM**	NM	NM	**19%**	12%	15%

The following sections provide a comparative discussion of the Firm's results by segment as of or for the years ended December 31, 2021 and 2020.

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit, investment and lending products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue			
Lending- and deposit-related fees	**$ 3,034**	$ 3,166	$ 3,938
Asset management, administration and commissions	**3,514**	2,780	2,808
Mortgage fees and related income	**2,159**	3,079	2,035
Card income	**3,563**	3,068	3,412
All other income	**5,016**	5,647	5,603
Noninterest revenue	**17,286**	17,740	17,796
Net interest income	**32,787**	33,528	37,337
Total net revenue	**50,073**	51,268	55,133
Provision for credit losses	**(6,989)**	12,312	4,954
Noninterest expense			
Compensation expense	**12,142**	11,014	10,815
Noncompensation expense[(a)]	**17,114**	16,976	17,461
Total noninterest expense	**29,256**	27,990	28,276
Income before income tax expense	**27,806**	10,966	21,903
Income tax expense	**6,876**	2,749	5,362
Net income	**$20,930**	$ 8,217	$16,541
Revenue by line of business			
Consumer & Business Banking	**$23,980**	$22,955	$27,376
Home Lending	**5,291**	6,018	5,179
Card & Auto	**20,802**	22,295	22,578
Mortgage fees and related income details:			
Production revenue	**2,215**	2,629	1,618
Net mortgage servicing revenue[(b)]	**(56)**	450	417
Mortgage fees and related income	**$ 2,159**	$ 3,079	$ 2,035
Financial ratios			
Return on equity	**41 %**	15 %	31 %
Overhead ratio	**58**	55	51

(a) Included depreciation expense on leased assets of $3.3 billion, $4.2 billion and $4.0 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

(b) Included MSR risk management results of $(525) million, $(18) million and $(165) million for the years ended December 31, 2021, 2020 and 2019, respectively.

2021 compared with 2020

Net income was $20.9 billion, up $12.7 billion, driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was $50.1 billion, a decrease of 2%.

Net interest income was $32.8 billion, down 2%, driven by:

- the net impact in Card of lower revolving loans, primarily due to higher payments, and lower funding costs,

largely offset by

- higher loans in Auto, and
- the accelerated recognition of deferred processing fees associated with PPP loan forgiveness, largely offset by the net impact of margin compression on higher deposits in CBB.

Noninterest revenue was $17.3 billion, down 3%, driven by:

- a decrease in mortgage fees and related income due to a net loss in MSR risk management results primarily driven by updates to model inputs related to prepayment expectations as well as lower production margins,
- lower auto operating lease income as a result of a decline in volume, and
- lower overdraft fee revenue,

largely offset by

- higher asset management fees as a result of higher average market levels and net inflows, and
- higher card income due to higher net interchange income driven by an increase in debit and credit card sales volume above pre-pandemic levels, partially offset by the impact of a renegotiation of a co-brand partner contract, an increase to the rewards liability, and higher amortization related to new account origination costs.

Refer to Note 15 for further information regarding changes in the value of the MSR asset and related hedges, and mortgage fees and related income. Refer to Critical Accounting Estimates on pages 150-153, and Note 6 for additional information on card income.

Noninterest expense was $29.3 billion, up 5%, reflecting:

- increased compensation expense, as well as investments in technology and marketing campaigns, and growth in travel-related benefits,

partially offset by

- lower depreciation expense due to lower auto lease assets and the impact of higher vehicle collateral values.

The provision for credit losses was a net benefit of $7.0 billion, compared with an expense of $12.3 billion in the prior year, driven by:

- a $9.8 billion reduction in the allowance for credit losses, reflecting improvements in the Firm's macroeconomic outlook, consisting of $7.6 billion in Card, $675 million in CBB, $300 million in Auto and $1.2 billion in Home Lending, which also reflects continued improvements in HPI expectations, and
- lower net charge-offs predominantly in Card, as consumer cash balances remained elevated.

The prior year included a $7.8 billion addition to the allowance for credit losses.

Refer to Credit and Investment Risk Management on pages 106-132 and Allowance for Credit Losses on pages 129-131 for a further discussion of the credit portfolios and the allowance for credit losses.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020	2019
Selected balance sheet data (period-end)			
Total assets	**$ 500,370**	$ 496,705	$ 541,367
Loans:			
Consumer & Business Banking [(a)]	**35,095**	48,810	29,585
Home Lending[(b)]	**180,529**	182,121	213,445
Card	**154,296**	144,216	168,924
Auto	**69,138**	66,432	61,522
Total loans	**439,058**	441,579	473,476
Deposits	**1,148,110**	958,706	723,418
Equity	**50,000**	52,000	52,000
Selected balance sheet data (average)			
Total assets	**$ 489,771**	$ 501,584	$ 543,127
Loans:			
Consumer & Business Banking	**44,906**	43,064	28,859
Home Lending[(c)]	**181,049**	197,148	230,662
Card	**140,405**	146,633	156,325
Auto	**67,624**	61,476	61,862
Total loans	**433,984**	448,321	477,708
Deposits	**1,054,956**	851,390	698,378
Equity	**50,000**	52,000	52,000
Headcount	**128,863**	122,894	125,756

(a) At December 31, 2021 and 2020 included $5.4 billion and $19.2 billion of loans, respectively, in Business Banking under the PPP. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
(b) At December 31, 2021, 2020 and 2019, Home Lending loans held-for-sale and loans at fair value were $14.9 billion, $9.7 billion and $16.6 billion, respectively.
(c) Average Home Lending loans held-for sale and loans at fair value were $15.4 billion, $11.1 billion and $14.1 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

Selected metrics

As of or for the year ended December 31, (in millions, except ratio data)	2021	2020	2019
Credit data and quality statistics			
Nonaccrual loans[(a)(b)(c)]	**$4,875** [(h)]	$5,492 [(i)]	$3,027
Net charge-offs/(recoveries)			
Consumer & Business Banking	**289**	263	298
Home Lending	**(275)**	(169)	(98)
Card	**2,712**	4,286	4,848
Auto	**35**	123	206
Total net charge-offs/ (recoveries)	**$2,761**	$4,503	$5,254
Net charge-off/(recovery) rate			
Consumer & Business Banking[(d)]	**0.64 %**	0.61 %	1.03 %
Home Lending	**(0.17)**	(0.09)	(0.05)
Card	**1.94**	2.93	3.10
Auto	**0.05**	0.20	0.33
Total net charge-off/ (recovery) rate	**0.66 %**	1.03 %	1.13 %
30+ day delinquency rate[(e)]			
Home Lending[(f)(g)]	**1.25 %**	1.15 %	1.58 %
Card	**1.04**	1.68	1.87
Auto	**0.64**	0.69	0.94
90+ day delinquency rate - Card[(e)]	**0.50 %**	0.92 %	0.95 %
Allowance for loan losses			
Consumer & Business Banking	**$ 697**	$1,372	$ 750
Home Lending	**660**	1,813	1,890
Card	**10,250**	17,800	5,683
Auto	**733**	1,042	465
Total allowance for loan losses	**$12,340**	$22,027	$8,788

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption resulted in a change in the accounting for purchased credit-impaired ("PCI") loans, which are considered purchased credit deteriorated ("PCD") loans under CECL. Refer to Consumer Credit Portfolio on pages 110-116 and Note 12 for further information on PCD loans.

(a) At both December 31, 2021 and 2020, nonaccrual loans included $1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.
(b) At December 31, 2021, 2020 and 2019, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $342 million, $558 million and $963 million, respectively. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.
(c) At December 31, 2021 and 2020, generally excludes loans that were under payment deferral programs offered in response to the COVID-19 pandemic. Refer to Consumer Credit Portfolio on pages 110-116 for further information on consumer payment assistance activity. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
(d) At December 31, 2021 and 2020, included $5.4 billion and $19.2 billion of loans, respectively, in Business Banking under the PPP. The Firm does not expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
(e) At December 31, 2021 and 2020, the principal balance of loans in Home Lending, Card and Auto under payment deferral programs offered in response to the COVID-19 pandemic were as follows: (1) $1.1 billion and $9.1 billion in Home Lending, respectively; (2) $46 million and $264 million in Card, respectively; and (3) $115 million

and $376 million in Auto, respectively. Loans that are performing according to their modified terms are generally not considered delinquent. Refer to Consumer Credit Portfolio on pages 110-116 for further information on consumer payment assistance activity.
(f) At December 31, 2021 and 2020, the 30+ day delinquency rates included PCD loans. The rate at December 31, 2019 was revised to include the impact of PCI loans.
(g) At December 31, 2021, 2020 and 2019, excluded mortgage loans insured by U.S. government agencies of $405 million, $744 million and $1.7 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
(h) At December 31, 2021, nonaccrual loans excluded $506 million of PPP loans 90 or more days past due and guaranteed by the SBA.
(i) Prior-period amount has been revised to conform with the current presentation.

Selected metrics

As of or for the year ended December 31, (in billions, except ratios and where otherwise noted)	2021	2020	2019
Business Metrics			
CCB households (in millions)	**66.3**	63.4	62.6
Number of branches	**4,790**	4,908	4,976
Active digital customers (in thousands)[(a)]	**58,857**	55,274	52,453
Active mobile customers (in thousands)[(b)]	**45,452**	40,899	37,315
Debit and credit card sales volume	**$1,360.7**	$1,081.2	$1,114.4
Consumer & Business Banking			
Average deposits	**$1,035.4**	$ 832.5	$ 683.7
Deposit margin	**1.27 %**	1.58 %	2.48 %
Business banking origination volume[(c)]	**$ 13.9**	$ 26.6	$ 6.6
Client investment assets[(d)]	**718.1**	590.2	501.4
Number of client advisors	**4,725**	4,417	4,196
Home Lending			
Mortgage origination volume by channel			
Retail	**$ 91.8**	$ 72.9	$ 51.0
Correspondent	**70.9**	40.9	54.2
Total mortgage origination volume[(e)]	**$ 162.7**	$ 113.8	$ 105.2
Third-party mortgage loans serviced (period-end)	**$ 519.2**	$ 447.3	$ 520.8
MSR carrying value (period-end)	**5.5**	3.3	4.7
Ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end)	**1.06 %**	0.74 %	0.90 %
MSR revenue multiple[(f)]	**3.93x**	2.55x	2.65x
Credit Card			
Credit card sales volume, excluding commercial card	**$ 893.5**	$ 702.7	$ 762.8
New accounts opened (in millions)	**8.0**	5.4	7.8
Net revenue rate	**10.51 %**	10.92 %	10.48 %
Auto			
Loan and lease origination volume	**$ 43.6**	$ 38.4	$ 34.0
Average auto operating lease assets	**19.1**	22.0	21.6

(a) Users of all web and/or mobile platforms who have logged in within the past 90 days.
(b) Users of all mobile platforms who have logged in within the past 90 days.
(c) Included origination volume under the PPP of $10.6 billion and $21.9 billion for the years ended December 31, 2021 and 2020, respectively. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
(d) Includes assets invested in managed accounts and J.P. Morgan mutual funds where AWM is the investment manager. Refer to AWM segment results on pages 76-78 for additional information.
(e) Firmwide mortgage origination volume was $182.4 billion, $133.4 billion and $115.9 billion for the years ended December 31, 2021, 2020 and 2019, respectively.
(f) Represents the ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end) divided by the ratio of annualized loan servicing-related revenue to third-party mortgage loans serviced (average).

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Selected income statement data

Year ended December 31, (in millions)	2021	2020	2019
Revenue			
Investment banking fees	**$ 13,359**	$ 9,477	$ 7,575
Principal transactions	**15,764**	17,560	14,399
Lending- and deposit-related fees	**2,514**	2,070	1,668
Asset management, administration and commissions	**5,024**	4,721	4,400
All other income	**1,548**	1,292	2,018
Noninterest revenue	**38,209**	35,120	30,060
Net interest income	**13,540**	14,164	9,205
Total net revenue[(a)]	**51,749**	49,284	39,265
Provision for credit losses	**(1,174)**	2,726	277
Noninterest expense			
Compensation expense	**13,096**	11,612	11,180
Noncompensation expense	**12,229**	11,926	11,264
Total noninterest expense	**25,325**	23,538	22,444
Income before income tax expense	**27,598**	23,020	16,544
Income tax expense	**6,464**	5,926	4,590
Net income	**$ 21,134**	$ 17,094	$ 11,954

(a) Includes tax-equivalent adjustments, predominantly due to income tax credits and other tax benefits related to alternative energy investments; income tax credits and amortization of the cost of investments in affordable housing projects; and tax-exempt income from municipal bonds of $3.0 billion, $2.4 billion and $1.9 billion for the years ended December 31, 2021, 2020 and 2019, respectively. Prior-period tax-equivalent adjustment amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Financial ratios			
Return on equity	**25 %**	20 %	14 %
Overhead ratio	**49**	48	57
Compensation expense as percentage of total net revenue	**25**	24	28
Revenue by business			
Investment Banking	**$12,506**	$ 8,871	$ 7,215
Payments[(a)]	**6,270**	5,560	5,842
Lending	**1,001**	1,146	1,021
Total Banking	**19,777**	15,577	14,078
Fixed Income Markets	**16,865**	20,878	14,418
Equity Markets	**10,529**	8,605	6,494
Securities Services	**4,328**	4,253	4,154
Credit Adjustments & Other[(b)]	**250**	(29)	121
Total Markets & Securities Services	**31,972**	33,707	25,187
Total net revenue	**$51,749**	$49,284	$39,265

(a) In the fourth quarter of 2021, the Wholesale Payments business was renamed Payments.
(b) Consists primarily of centrally managed credit valuation adjustments ("CVA"), funding valuation adjustments ("FVA") on derivatives, other valuation adjustments, and certain components of fair value option elected liabilities, which are primarily reported in principal transactions revenue. Results are presented net of associated hedging activities and net of CVA and FVA amounts allocated to Fixed Income Markets and Equity Markets. Refer to Notes 2, 3 and 24 for additional information.

2021 compared with 2020

Net income was $21.1 billion, up 24%, largely driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was $51.7 billion, up 5%.

Banking revenue was $19.8 billion, up 27%.

- Investment Banking revenue was $12.5 billion, up 41%, driven by higher Investment Banking fees, reflecting higher fees across products. The Firm ranked #1 for Global Investment Banking fees, according to Dealogic.
  - Advisory fees were $4.4 billion, up 85%, driven by increased M&A activity and wallet share gains.
  - Equity underwriting fees were $4.0 billion, up 43%, driven by a strong IPO market and wallet share gains.
  - Debt underwriting fees were $5.0 billion, up 15%, predominantly driven by an active leveraged loan market primarily related to acquisition financing.
- Payments revenue was $6.3 billion, up 13%, and included net gains on equity investments. Excluding these net gains, revenue was $5.8 billion, up 5%, driven by higher deposit balances and fees, largely offset by deposit margin compression.
- Lending revenue was $1.0 billion, down 13%, predominantly driven by lower net interest income, largely offset by lower fair value losses on hedges of accrual loans, and higher loan commitment fees.

Markets & Securities Services revenue was $32.0 billion, down 5%. Markets revenue was $27.4 billion, down 7%.

- Fixed Income Markets revenue was $16.9 billion, down 19%, driven by lower revenue in Rates, Currencies & Emerging Markets, Fixed Income Financing, Commodities and Credit compared to a strong prior year, partially offset by higher revenue in Securitized Products.
- Equity Markets revenue was $10.5 billion, up 22%, driven by strong performance across prime brokerage, derivatives and Cash Equities.
- Securities Services revenue was $4.3 billion, up 2%, driven by growth in fees and deposits, predominantly offset by deposit margin compression.
- Credit Adjustments & Other was a gain of $250 million predominantly driven by valuation adjustments related to derivatives.

Noninterest expense was $25.3 billion, up 8%, predominantly driven by higher compensation expense, including revenue-related compensation and investments, as well as higher volume-related brokerage expense, partially offset by lower legal expense.

The provision for credit losses was a net benefit of $1.2 billion, driven by a net reduction in the allowance for credit losses, compared with an expense of $2.7 billion in the prior year.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020		2019
Selected balance sheet data (period-end)				
Total assets[a]	**$1,259,896**	$1,095,926		$913,803
Loans:				
Loans retained[b]	**159,786**	133,296		121,733
Loans held-for-sale and loans at fair value[c]	**50,386**	39,588		34,317
Total loans	**210,172**	172,884		156,050
Equity	**83,000**	80,000		80,000
Selected balance sheet data (average)				
Total assets[a]	**$1,334,518**	$1,121,942		$992,770
Trading assets-debt and equity instruments	**448,099**	425,060	(e)	376,182
Trading assets-derivative receivables	**68,203**	69,243	(e)	48,196
Loans:				
Loans retained[b]	**145,137**	135,676		122,371
Loans held-for-sale and loans at fair value[c]	**51,072**	33,792		32,884
Total loans	**196,209**	169,468		155,255
Equity	**83,000**	80,000		80,000
Headcount[d]	**67,546**	61,733		60,013

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
(b) Includes secured lending-related positions, credit portfolio loans, loans held by consolidated Firm-administered multi-seller conduits, trade finance loans, other held-for-investment loans and overdrafts.
(c) Primarily reflects lending-related positions originated and purchased in CIB Markets, including loans held for securitization.
(d) During the six months ended June 30, 2021, 1,155 technology and risk management employees were transferred from Corporate to CIB.
(e) Prior-period amounts have been revised to conform with the current presentation.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2021	2020	2019
Credit data and quality statistics			
Net charge-offs/ (recoveries)	**$ 6**	$ 370	$ 183
Nonperforming assets:			
Nonaccrual loans:			
Nonaccrual loans retained[a]	**584**	1,008	308
Nonaccrual loans held-for-sale and loans at fair value[b]	**844**	1,662	644
Total nonaccrual loans	**1,428**	2,670	952
Derivative receivables	**316**	56	30
Assets acquired in loan satisfactions	**91**	85	70
Total nonperforming assets	**1,835**	2,811	1,052
Allowance for credit losses:			
Allowance for loan losses	**1,348**	2,366	1,202
Allowance for lending-related commitments	**1,372**	1,534	848
Total allowance for credit losses	**2,720**	3,900	2,050
Net charge-off/(recovery) rate[c]	**— %**	0.27 %	0.15 %
Allowance for loan losses to period-end loans retained	**0.84**	1.77	0.99
Allowance for loan losses to period-end loans retained, excluding trade finance and conduits[d]	**1.12**	2.54	1.31
Allowance for loan losses to nonaccrual loans retained[a]	**231**	235	390
Nonaccrual loans to total period-end loans	**0.68**	1.54	0.61

(a) Allowance for loan losses of $58 million, $278 million and $110 million were held against these nonaccrual loans at December 31, 2021, 2020 and 2019, respectively.
(b) At December 31, 2021, 2020 and 2019, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $281 million, $316 million and $127 million, respectively. These amounts have been excluded based upon the government guarantee.
(c) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.
(d) Management uses allowance for loan losses to period-end loans retained, excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB's allowance coverage ratio.

Investment banking fees

(in millions)	Year ended December 31, 2021	2020	2019
Advisory	$ 4,381	$ 2,368	$ 2,377
Equity underwriting	3,953	2,758	1,666
Debt underwriting[(a)]	5,025	4,351	3,532
Total investment banking fees	$ 13,359	$ 9,477	$ 7,575

(a) Represents long-term debt and loan syndications.

League table results – wallet share

	2021		2020		2019	
Year ended December 31,	Rank	Share	Rank	Share	Rank	Share
Based on fees[(a)]						
M&A[(b)]						
Global	# 2	10.2 %	# 2	9.0 %	# 2	9.0 %
U.S.	2	11.3	2	9.5	2	9.3
Equity and equity-related[(c)]						
Global	2	8.9	2	8.9	1	9.4
U.S.	2	11.8	2	12.0	1	13.5
Long-term debt[(d)]						
Global	1	8.4	1	8.8	1	7.8
U.S.	1	12.1	1	12.8	1	12.0
Loan syndications						
Global	1	10.9	1	11.1	1	10.1
U.S.	1	12.6	1	12.3	1	12.4
Global investment banking fees[(e)]	# 1	9.5 %	# 1	9.2 %	# 1	8.9 %

(a) Source: Dealogic as of January 3, 2022. Reflects the ranking of revenue wallet and market share.
(b) Global M&A excludes any withdrawn transactions. U.S. M&A revenue wallet represents wallet from client parents based in the U.S.
(c) Global equity and equity-related ranking includes rights offerings and Chinese A-Shares.
(d) Long-term debt rankings include investment-grade, high-yield, supranationals, sovereigns, agencies, covered bonds, asset-backed securities ("ABS") and mortgage-backed securities ("MBS"); and exclude money market, short-term debt, and U.S. municipal securities.
(e) Global investment banking fees exclude money market, short-term debt and shelf securities.

Markets revenue

The following table summarizes selected income statement data for the Markets businesses. Markets includes both Fixed Income Markets and Equity Markets. Markets revenue consists of principal transactions, fees, commissions and other income, as well as net interest income. The Firm assesses its Markets business performance on a total revenue basis, as offsets may occur across revenue line items. For example, securities that generate net interest income may be risk-managed by derivatives that are reflected at fair value in principal transactions revenue. Refer to Notes 6 and 7 for a description of the composition of these income statement line items.

Principal transactions reflects revenue on financial instruments and commodities transactions that arise from client-driven market-making activity. Principal transactions revenue includes amounts recognized upon executing new transactions with market participants, as well as "inventory-related revenue", which is revenue recognized from gains and losses on derivatives and other instruments that the Firm has been holding in anticipation of, or in response to, client demand, and changes in the fair value of instruments used by the Firm to actively manage the risk exposure arising from such inventory. Principal transactions revenue recognized upon executing new transactions with market participants is affected by many factors including the level of client activity, the bid-offer spread (which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa), market liquidity and volatility. These factors are interrelated and sensitive to the same factors that drive inventory-related revenue, which include general market conditions, such as interest rates, foreign exchange rates, credit spreads, and equity and commodity prices, as well as other macroeconomic conditions.

For the periods presented below, the predominant source of principal transactions revenue was the amount recognized upon executing new transactions.

Year ended December 31, (in millions, except where otherwise noted)	2021 Fixed Income Markets	2021 Equity Markets	2021 Total Markets	2020 Fixed Income Markets	2020 Equity Markets	2020 Total Markets	2019 Fixed Income Markets	2019 Equity Markets	2019 Total Markets
Principal transactions	**$ 7,911**	**$ 7,519**	**$ 15,430**	$ 11,857	$ 6,087	$ 17,944	$ 8,786	$ 5,739	$ 14,525
Lending- and deposit-related fees	**321**	**17**	**338**	226	10	236	198	7	205
Asset management, administration and commissions	**545**	**1,967**	**2,512**	411	2,087	2,498	407	1,775	2,182
All other income	**972**	**(101)**	**871**	493	(62)	431	872	8	880
Noninterest revenue	**9,749**	**9,402**	**19,151**	12,987	8,122	21,109	10,263	7,529	17,792
Net interest income	**7,116**	**1,127**	**8,243**	7,891	483	8,374	4,155	(1,035)	3,120
Total net revenue	**$ 16,865**	**$ 10,529**	**$ 27,394**	$ 20,878	$ 8,605	$ 29,483	$ 14,418	$ 6,494	$ 20,912
Loss days[(a)]			4			4			1

(a) Loss days represent the number of days for which CIB Markets, which consists of Fixed Income Markets and Equity Markets, posted losses to total net revenue. The loss days determined under this measure differ from the measure used to determine backtesting gains and losses. Daily backtesting gains and losses include positions in the Firm's Risk Management value-at-risk ("VaR") measure and exclude select components of total net revenue, which may more than offset backtesting gains or losses on a particular day. For more information on daily backtesting gains and losses, refer to the VaR discussion on pages 135-137.

Selected metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)	2021	2020	2019
Assets under custody ("AUC") by asset class (period-end) (in billions):			
Fixed Income	**$ 16,098**	$ 15,840	$ 13,498
Equity	**12,962**	11,489	10,100
Other[(a)]	**4,161**	3,651	3,233
Total AUC	**$ 33,221**	$ 30,980	$ 26,831
Merchant processing volume (in billions)[(b)]	**$ 1,886.7**	$ 1,597.3	$ 1,511.5
Client deposits and other third party liabilities (average)[(c)]	**$ 714,910**	$ 610,555	$ 464,795

(a) Consists of mutual funds, unit investment trusts, currencies, annuities, insurance contracts, options and other contracts.
(b) Represents total merchant processing volume across CIB, CCB and CB.
(c) Client deposits and other third-party liabilities pertain to the Payments and Securities Services businesses.

International metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)		2021		2020		2019
Total net revenue[a]						
Europe/Middle East/Africa	$	**13,954**	$	13,872	$	11,905
Asia-Pacific		**7,555**		7,524		5,319
Latin America/Caribbean		**1,833**		1,931		1,543
Total international net revenue		**23,342**		23,327		18,767
North America		**28,407**		25,957		20,498
Total net revenue	$	**51,749**	$	49,284	$	39,265
Loans retained (period-end)[a]						
Europe/Middle East/Africa	$	**33,084**	$	27,659	$	26,067
Asia-Pacific		**14,471**		12,802		14,759
Latin America/Caribbean		**7,006**		5,425		6,173
Total international loans		**54,561**		45,886		46,999
North America		**105,225**		87,410		74,734
Total loans retained	$	**159,786**	$	133,296	$	121,733
Client deposits and other third-party liabilities (average)[b]						
Europe/Middle East/Africa	$	**243,867**	$	211,592	$	174,477
Asia-Pacific		**132,241**		124,145		90,364
Latin America/Caribbean		**46,045**		37,664		29,024
Total international	$	**422,153**	$	373,401	$	293,865
North America		**292,757**		237,154		170,930
Total client deposits and other third-party liabilities	$	**714,910**	$	610,555	$	464,795
AUC (period-end)[b] **(in billions)**						
North America	$	**21,655**	$	20,028	$	16,855
All other regions		**11,566**		10,952		9,976
Total AUC	$	**33,221**	$	30,980	$	26,831

(a) Total net revenue and loans retained (excluding loans held-for-sale and loans at fair value) are based on the location of the trading desk, booking location, or domicile of the client, as applicable.

(b) Client deposits and other third-party liabilities pertaining to the Payments and Securities Services businesses, and AUC, are based on the domicile of the client.

Commercial Banking provides comprehensive financial solutions, including lending, payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and midsized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Selected income statement data

Year ended December 31, (in millions)	2021	2020	2019
Revenue			
Lending- and deposit-related fees	$ 1,392	$ 1,187	$ 941
All other income	2,537	1,880	1,769
Noninterest revenue	3,929	3,067	2,710
Net interest income	6,079	6,246	6,554
Total net revenue[(a)]	10,008	9,313	9,264
Provision for credit losses	(947)	2,113	296
Noninterest expense			
Compensation expense	1,973	1,854	1,785
Noncompensation expense	2,068	1,944	1,950
Total noninterest expense	4,041	3,798	3,735
Income before income tax expense	6,914	3,402	5,233
Income tax expense	1,668	824	1,275
Net income	$ 5,246	$ 2,578	$ 3,958

(a) Total net revenue included tax-equivalent adjustments from income tax credits related to equity investments in designated community development entities and in entities established for rehabilitation of historic properties, as well as tax-exempt income related to municipal financing activities, of $330 million, $350 million and $460 million for the years ended December 31, 2021, 2020 and 2019, respectively. Prior-period tax-equivalent adjustment amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

2021 compared with 2020

Net income was $5.2 billion, up $2.7 billion, predominantly driven by a net benefit in the provision for credit losses, compared to an expense in the prior year.

Net revenue was $10.0 billion, up 7%. Net interest income was $6.0 billion, down 3%, driven by the net impact of margin compression on higher deposits and a decrease in loans, largely offset by lower funding costs. Noninterest revenue was $3.9 billion, up 28%, predominantly driven by higher investment banking and payments revenue.

Noninterest expense was $4.0 billion, up 6%, predominantly driven by investments in the business, including higher compensation expense, and higher volume- and revenue-related expense.

The provision for credit losses was a net benefit of $947 million, driven by a net reduction in the allowance for credit losses, compared with an expense of $2.1 billion in the prior year.

CB product revenue consists of the following:

Lending includes a variety of financing alternatives, which are primarily provided on a secured basis; collateral includes receivables, inventory, equipment, real estate or other assets. Products include term loans, revolving lines of credit, bridge financing, asset-based structures, leases, and standby letters of credit.

Payments includes revenue from a broad range of products and services that enable CB clients to manage payments and receipts, as well as invest and manage funds.

Investment banking includes revenue from a range of products providing CB clients with sophisticated capital-raising alternatives, as well as balance sheet and risk management tools through advisory, equity underwriting, and loan syndications. Revenue from Fixed Income and Equity Markets products used by CB clients is also included.

Other revenue primarily includes tax-equivalent adjustments generated from Community Development Banking and activity derived from principal transactions.

Selected income statement data (continued)

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue by product			
Lending	**$ 4,629**	$ 4,396	$ 4,057
Payments	**3,653**	3,715	4,200
Investment banking[(a)]	**1,611**	1,069	919
Other	**115**	133	88
Total Commercial Banking net revenue	**$ 10,008**	$ 9,313	$ 9,264
Investment banking revenue, gross[(b)]	**$ 5,092**	$ 3,348	$ 2,744
Revenue by client segment			
Middle Market Banking	**$ 4,004**	$ 3,640	$ 3,805
Corporate Client Banking	**3,508**	3,203	3,119
Commercial Real Estate Banking	**2,419**	2,313	2,169
Other	**77**	157	171
Total Commercial Banking net revenue	**$ 10,008**	$ 9,313	$ 9,264
Financial ratios			
Return on equity	**21 %**	11 %	17 %
Overhead ratio	**40**	41	40

(a) Includes CB's share of revenue from investment banking products sold to CB clients through the CIB.

(b) Refer to Business Segment Results page 61 for a discussion of revenue sharing.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2021	2020	2019
Selected balance sheet data (period-end)			
Total assets	**$ 230,776**	$ 228,911 [(b)]	$ 220,514
Loans:			
Loans retained	**206,220**	207,880	207,287
Loans held-for-sale and loans at fair value	**2,223**	2,245	1,009
Total loans	**$ 208,443**	$ 210,125	$ 208,296
Equity	**24,000**	22,000	22,000
Period-end loans by client segment			
Middle Market Banking[(a)]	**$ 61,159**	$ 61,115	$ 54,188
Corporate Client Banking	**45,315**	47,420	51,165
Commercial Real Estate Banking	**101,751**	101,146	101,951
Other	**218**	444	992
Total Commercial Banking loans[(a)]	**$ 208,443**	$ 210,125	$ 208,296
Selected balance sheet data (average)			
Total assets	**$ 225,548**	$ 233,156 [(b)]	$ 218,896
Loans:			
Loans retained	**201,920**	217,767	206,837
Loans held-for-sale and loans at fair value	**3,122**	1,129	1,082
Total loans	**$ 205,042**	$ 218,896	$ 207,919
Client deposits and other third-party liabilities	**301,502**	237,825	172,734
Equity	**24,000**	22,000	22,000
Average loans by client segment			
Middle Market Banking	**$ 60,128**	$ 61,558	$ 55,690
Corporate Client Banking	**44,361**	54,172	50,360
Commercial Real Estate Banking	**100,331**	102,479	100,884
Other	**222**	687	985
Total Commercial Banking loans	**$ 205,042**	$ 218,896	$ 207,919
Headcount	**12,902**	11,675	11,629

(a) At December 31, 2021 and 2020, total loans included $1.2 billion and $6.6 billion of loans under the PPP, of which $1.1 billion and $6.4 billion were in Middle Market Banking, respectively. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	2021	2020	2019
Credit data and quality statistics			
Net charge-offs/(recoveries)	**$ 71**	$ 401	$ 160
Nonperforming assets			
Nonaccrual loans:			
Nonaccrual loans retained[a]	**740** [c]	1,286	498
Nonaccrual loans held-for-sale and loans at fair value	**—**	120	—
Total nonaccrual loans	**740**	1,406	498
Assets acquired in loan satisfactions	**17**	24	25
Total nonperforming assets	**757**	1,430	523
Allowance for credit losses:			
Allowance for loan losses	**2,219**	3,335	2,780
Allowance for lending-related commitments	**749**	651	293
Total allowance for credit losses	**2,968**	3,986	3,073
Net charge-off/(recovery) rate[b]	**0.04 %**	0.18 %	0.08 %
Allowance for loan losses to period-end loans retained	**1.08**	1.60	1.34
Allowance for loan losses to nonaccrual loans retained[a]	**300**	259	558
Nonaccrual loans to period-end total loans	**0.36**	0.67	0.24

(a) Allowance for loan losses of $124 million, $273 million and $114 million was held against nonaccrual loans retained at December 31, 2021, 2020 and 2019, respectively.
(b) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.
(c) At December 31, 2021, nonaccrual loans excluded $114 million of PPP loans 90 or more days past due and guaranteed by the SBA.

ASSET & WEALTH MANAGEMENT

Asset & Wealth Management, with client assets of $4.3 trillion, is a global leader in investment and wealth management.

Asset Management
Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Global Private Bank
Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2021	2020	2019
Revenue			
Asset management, administration and commissions	**$12,333**	$10,610	$ 9,818
All other income	**738**	212	418
Noninterest revenue	**13,071**	10,822	10,236
Net interest income	**3,886**	3,418	3,355
Total net revenue	**16,957**	14,240	13,591
Provision for credit losses	**(227)**	263	59
Noninterest expense			
Compensation expense	**5,692**	4,959	5,028
Noncompensation expense	**5,227**	4,998	4,719
Total noninterest expense	**10,919**	9,957	9,747
Income before income tax expense	**6,265**	4,020	3,785
Income tax expense	**1,528**	1,028	918
Net income	**$ 4,737**	$ 2,992	$ 2,867
Revenue by line of business			
Asset Management	**$ 9,246**	$ 7,654	$ 7,254
Global Private Bank[(a)]	**7,711**	6,586	6,337
Total net revenue	**$16,957**	$14,240	$13,591
Financial ratios			
Return on equity	**33 %**	28 %	26 %
Overhead ratio	**64**	70	72
Pre-tax margin ratio:			
Asset Management	**35**	29	26
Global Private Bank[(a)]	**39**	27	30
Asset & Wealth Management	**37**	28	28

(a) In the first quarter of 2021, the Wealth Management business was renamed Global Private Bank.

2021 compared with 2020

Net income was $4.7 billion, an increase of 58%.

Net revenue was $17.0 billion, an increase of 19%. Net interest income was $3.9 billion, up 14%. Noninterest revenue was $13.1 billion, up 21%.

Revenue from Asset Management was $9.2 billion, up 21%, predominantly driven by:

- higher asset management fees, net of liquidity fee waivers, on higher average market levels and strong cumulative net inflows into long-term and liquidity products,
- higher performance fees, and
- higher net investment valuation gains.

Revenue from Global Private Bank was $7.7 billion, up 17%, predominantly driven by:

- higher loans including the impact of lower funding costs, and higher asset management fees,

partially offset by

- the net impact of margin compression on higher deposits.

The provision for credit losses was a net benefit of $227 million, driven by a reduction in the allowance for credit losses, compared with an expense of $263 million in the prior year.

Noninterest expense was $10.9 billion, up 10%, driven by higher volume- and revenue-related compensation expense and distribution fees, higher structural expense, and higher investments in the business, partially offset by lower legal expense.

Asset Management has two high-level measures of its overall fund performance.

Effective September 2021, AWM changed the source for the peer group quartile rankings of its funds from Lipper to Morningstar for U.S.-domiciled funds (except for "Municipals" and "Investor" funds, for which the source remains Lipper) and Taiwan domiciled funds. AWM evaluates fund performance utilizing this peer group ranking and believes that it provides investors with comparability across the industry. This change resulted in both positive and negative impacts on the quartile rankings for prior periods, as compared to how they would have been ranked by Lipper. In addition, AWM has changed its selection of the "primary share class" for certain non-U.S. funds, as set forth below, in order to establish a more consistent approach across these products. Prior periods in the following table have been revised to conform to the current presentation.

- **Percentage of mutual fund assets under management in funds rated 4- or 5-star:** Mutual fund rating services rank funds based on their risk adjusted performance over various periods. A 5-star rating is the best rating and represents the top 10% of industry-wide ranked funds. A 4-star rating represents the next 22.5% of industry-wide ranked funds. A 3-star rating represents the next 35% of industry-wide ranked funds. A 2-star rating represents the next 22.5% of industry-wide ranked funds. A 1-star rating is the worst rating and represents the bottom 10% of industrywide ranked funds. An overall Morningstar rating is derived from a weighted average of the performance associated with a fund's three-, five and ten- year (if applicable) Morningstar Rating metrics. For U.S.-domiciled funds, separate star ratings are provided at the individual share class level. The Nomura "star rating" is based on three-year risk-adjusted performance only. Funds with fewer than three years of history are not rated and hence excluded from these rankings. All ratings, the assigned peer categories and the asset values used to derive these rankings are sourced from the applicable fund rating provider. Where applicable, the fund rating providers redenominate asset values into U.S. dollars. The percentage of AUM is based on star ratings at the share class level for U.S.-domiciled funds, and at a "primary share class" level to represent the star rating of all other funds, except for Japan, for which Nomura provides ratings at the fund level. The performance data may have been different if all share classes had been included. Past performance is not indicative of future results.
- **Percentage of mutual fund assets under management in funds ranked in the 1st or 2nd quartile (one, three and five years):** All quartile rankings, the assigned peer categories and the asset values used to derive these rankings are sourced from the fund rating providers. Quartile rankings are based on the net-of-fee absolute return of each fund. Where applicable, the fund rating providers redenominate asset values into U.S. dollars. The percentage of AUM is based on fund performance and associated peer rankings at the share class level for U.S.-domiciled funds, at a "primary share class" level to represent the quartile ranking for U.K., Luxembourg and Hong Kong SAR funds and at the fund level for all other funds. The performance data may have been different if all share classes had been included. Past performance is not indicative of future results.

"**Primary share class**" means the C share class for European funds and Acc share class for Hong Kong SAR and Taiwan funds. If these share classes are not available, the oldest share class is used as the primary share class.

Selected metrics

As of or for the year ended December 31, (in millions, except ranking data, ratios and headcount)	2021	2020	2019
% of JPM mutual fund assets rated as 4- or 5-star[a]	**69 %**	63 %	66 %
% of JPM mutual fund assets ranked in 1st or 2nd quartile:[b]			
1 year	**53**	63	59
3 years	**72**	69	74
5 years	**80**	72	75
Selected balance sheet data (period-end)[c]			
Total assets	**$234,425**	$203,384	$173,175
Loans	**218,271**	186,608	158,149
Deposits	**282,052**	198,755	142,740
Equity	**14,000**	10,500	10,500
Selected balance sheet data (average)[c]			
Total assets	**$217,187**	$181,432	$161,863
Loans	**198,487**	166,311	147,404
Deposits	**230,296**	161,955	135,265
Equity	**14,000**	10,500	10,500
Headcount	**22,762**	20,683	21,550
Number of Global Private Bank client advisors	**2,738**	2,462	2,419
Credit data and quality statistics[c]			
Net charge-offs/(recoveries)	**$ 26**	$ (14)	$ 29
Nonaccrual loans	**708**	964 [d]	115
Allowance for credit losses:			
Allowance for loan losses	**$ 365**	$ 598	$ 350
Allowance for lending-related commitments	**18**	38	19
Total allowance for credit losses	**$ 383**	$ 636	$ 369
Net charge-off/(recovery) rate	**0.01 %**	(0.01)%	0.02 %
Allowance for loan losses to period-end loans	**0.17**	0.32	0.22
Allowance for loan losses to nonaccrual loans	**52**	62 [d]	304
Nonaccrual loans to period-end loans	**0.32**	0.52 [d]	0.07

(a) Represents the Morningstar Rating for all domiciled funds except for Japan domiciled funds which use Nomura. Includes only Asset Management retail open-ended mutual funds that have a rating. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds. Prior-period amounts were revised to conform with the current period presentation.
(b) Quartile ranking sourced from Morningstar, Lipper and Nomura based on country of domicile. Includes only Asset Management retail open-ended mutual funds that are ranked by the aforementioned sources. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds. Prior-period amounts were revised to conform with the current period presentation.
(c) Loans, deposits and related credit data and quality statistics relate to the Global Private Bank business.
(d) Prior-period amount has been revised to conform with the current presentation.

Client assets

2021 compared with 2020

Client assets were $4.3 trillion, an increase of 18%. Assets under management were $3.1 trillion, an increase of 15% driven by cumulative net inflows and the impact of higher market levels.

Client assets

December 31, (in billions)	2021	2020	2019
Assets by asset class			
Liquidity	**$ 708**	$ 641	$ 539
Fixed income	**693**	671	591
Equity	**779**	595	463
Multi-asset	**732**	656	596
Alternatives	**201**	153	139
Total assets under management	**3,113**	2,716	2,328
Custody/brokerage/ administration/deposits	**1,182**	936	761
Total client assets[a]	**$ 4,295**	$ 3,652	$ 3,089
Assets by client segment			
Private Banking	**$ 805**	$ 689	$ 628
Global Institutional[b]	**1,430**	1,273	1,081
Global Funds[b]	**878**	754	619
Total assets under management	**$ 3,113**	$ 2,716	$ 2,328
Private Banking	**$ 1,931**	$ 1,581	$ 1,359
Global Institutional[b]	**1,479**	1,311	1,106
Global Funds[b]	**885**	760	624
Total client assets[a]	**$ 4,295**	$ 3,652	$ 3,089

(a) Includes CCB client investment assets invested in managed accounts and J.P. Morgan mutual funds where AWM is the investment manager.
(b) In the first quarter of 2021, Institutional and Retail client segments were renamed to Global Institutional and Global Funds, respectively. This did not result in a change to the clients within either client segment.

Client assets (continued)

Year ended December 31, (in billions)	2021	2020	2019
Assets under management rollforward			
Beginning balance	**$ 2,716**	$ 2,328	$ 1,958
Net asset flows:			
Liquidity	**68**	104	61
Fixed income	**36**	48	104
Equity	**85**	33	(11)
Multi-asset	**17**	5	2
Alternatives	**26**	6	2
Market/performance/other impacts	**165**	192	212
Ending balance, December 31	**$ 3,113**	$ 2,716	$ 2,328
Client assets rollforward			
Beginning balance	**$ 3,652**	$ 3,089	$ 2,619
Net asset flows	**389**	276	176
Market/performance/other impacts	**254**	287	294
Ending balance, December 31	**$ 4,295**	$ 3,652	$ 3,089

International metrics

Year ended December 31, (in billions, except where otherwise noted)	2021	2020	2019
Total net revenue (in millions)[a]			
Europe/Middle East/Africa	**$ 3,571**	$ 2,956	$ 2,869
Asia-Pacific	**2,017**	1,665	1,509
Latin America/Caribbean	**886**	782	724
Total international net revenue	**6,474**	5,403	5,102
North America	**10,483**	8,837	8,489
Total net revenue	**$ 16,957**	$ 14,240	$ 13,591
Assets under management			
Europe/Middle East/Africa	**$ 561**	$ 517	$ 428
Asia-Pacific	**254**	224	192
Latin America/Caribbean	**79**	70	62
Total international assets under management	**894**	811	682
North America	**2,219**	1,905	1,646
Total assets under management	**$ 3,113**	$ 2,716	$ 2,328
Client assets			
Europe/Middle East/Africa	**$ 687**	$ 622	$ 520
Asia-Pacific	**381**	330	272
Latin America/Caribbean	**195**	166	147
Total international client assets	**1,263**	1,118	939
North America	**3,032**	2,534	2,150
Total client assets	**$ 4,295**	$ 3,652	$ 3,089

(a) Regional revenue is based on the domicile of the client.

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

Selected income statement and balance sheet data

Year ended December 31, (in millions, except headcount)	2021	2020	2019
Revenue			
Principal transactions	**$ 187**	$ 245	$ (461)
Investment securities gains/(losses)	**(345)**	795	258
All other income	**226**	159	89
Noninterest revenue	**68**	1,199	(114)
Net interest income	**(3,551)**	(2,375)	1,325
Total net revenue[(a)]	**(3,483)**	(1,176)	1,211
Provision for credit losses	**81**	66	(1)
Noninterest expense	**1,802**	1,373	1,067
Income/(loss) before income tax expense/(benefit)	**(5,366)**	(2,615)	145
Income tax expense/(benefit)	**(1,653)**	(865)	(966)
Net income/(loss)	**$ (3,713)**	$ (1,750)	$ 1,111
Total net revenue			
Treasury and CIO	**(3,464)**	(1,368)	2,032
Other Corporate	**(19)**	192	(821)
Total net revenue	**$ (3,483)**	$ (1,176)	$ 1,211
Net income/(loss)			
Treasury and CIO	**(3,057)**	(1,403)	1,394
Other Corporate	**(656)**	(347)	(283)
Total net income/(loss)	**$ (3,713)**	$ (1,750)	$ 1,111
Total assets (period-end)	**$1,518,100**	$1,359,831	$ 837,618
Loans (period-end)	**1,770**	1,657	1,649
Headcount[(b)]	**38,952**	38,366	38,033

(a) Included tax-equivalent adjustments, driven by tax-exempt income from municipal bonds, of $257 million, $241 million and $314 million for the years ended December 31, 2021, 2020 and 2019, respectively.
(b) During the six months ended June 30, 2021, 1,155 technology and risk management employees were transferred from Corporate to CIB.

2021 compared with 2020

Net income was a loss of $3.7 billion compared with a loss of $1.8 billion in the prior year.

Net revenue was a loss of $3.5 billion, compared with a loss of $1.2 billion in the prior year.

Net interest income decreased primarily driven by:

- limited opportunities to deploy funds in response to significant deposit growth across the LOBs, and
- the impact of faster prepayments on mortgage-backed securities in the first half of 2021,

partially offset by

- higher net interest income on growth in investment securities.

Noninterest revenue decreased primarily due to:

- net investment securities losses related to repositioning the investment securities portfolio, compared with net gains in the prior year from sales of U.S. GSE and government agency MBS,
- lower net valuation gains on several legacy equity investments

partially offset by

- the absence of losses recorded in the prior year in Treasury and CIO related to cash deployment transactions, which were more than offset by the related net interest income earned on these transactions, also in the prior year, and
- the absence of losses recorded in the prior year related to the early termination of certain of the Firm's long-term debt in Treasury and CIO

Noninterest expense of $1.8 billion was up $429 million primarily due to a higher contribution to the Firm's Foundation, investments related to the Firm's international consumer expansion, technology initiatives, and higher legal expense, largely offset by the absence of an impairment on a legacy investment recorded in the prior year.

Refer to Note 10 and Note 13 for additional information on the investment securities portfolio and the allowance for credit losses.

The current period income tax benefit was driven by changes in the level and mix of income and expenses subject to U.S. federal and state and local taxes as well as other tax adjustments, partially offset by the resolutions of certain tax audits.

Treasury and CIO overview

Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The risks managed by Treasury and CIO arise from the activities undertaken by the Firm's four major reportable business segments to serve their respective client bases, which generate both on- and off-balance sheet assets and liabilities.

Treasury and CIO seek to achieve the Firm's asset-liability management objectives generally by investing in high-quality securities that are managed for the longer-term as part of the Firm's investment securities portfolio. Treasury and CIO also use derivatives to meet the Firm's asset-liability management objectives. Refer to Note 5 for further information on derivatives. In addition, Treasury and CIO manage the Firm's cash position primarily through deposits at central banks and investments in short-term instruments. Refer to Liquidity Risk Management on pages 97-104 for further information on liquidity and funding risk. Refer to Market Risk Management on pages 133-140 for information on interest rate, foreign exchange and other risks.

The investment securities portfolio predominantly consists of U.S. GSE and government agency and nonagency mortgage-backed securities, U.S. and non-U.S. government securities, obligations of U.S. states and municipalities, other ABS and corporate debt securities. At December 31, 2021, the Treasury and CIO investment securities portfolio, net of allowance for credit losses, was $670.1 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and, where not available, based primarily upon internal risk ratings). Refer to Note 10 for further information on the Firm's investment securities portfolio and internal risk ratings.

Selected income statement and balance sheet data

As of or for the year ended December 31, (in millions)	**2021**	2020	2019
Investment securities gains/ (losses)	**$ (345)**	$ 795	$ 258
Available-for-sale securities (average)	**$ 306,827**	$ 413,367	$ 283,205
Held-to-maturity securities (average)[a]	**285,086**	94,569	34,939
Investment securities portfolio (average)	**$ 591,913**	$ 507,936	$ 318,144
Available-for-sale securities (period-end)	**$ 306,352**	$ 386,065	$ 348,876
Held-to-maturity securities, net of allowance for credit losses (period-end)[a]	**363,707**	201,821	47,540
Investment securities portfolio, net of allowance for credit losses (period-end)[b]	**$ 670,059**	$ 587,886	$ 396,416

(a) During 2021 and 2020, the Firm transferred $104.5 billion and $164.2 billion of investment securities, respectively, from AFS to HTM for capital management purposes.

(b) At December 31, 2021, and 2020, the allowance for credit losses on investment securities was $42 million and $78 million, respectively.

Refer to Note 10 for further information.

Risk is an inherent part of JPMorgan Chase's business activities. When the Firm extends a consumer or wholesale loan, advises customers and clients on their investment decisions, makes markets in securities, or offers other products or services, the Firm takes on some degree of risk. The Firm's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protects the safety and soundness of the Firm.

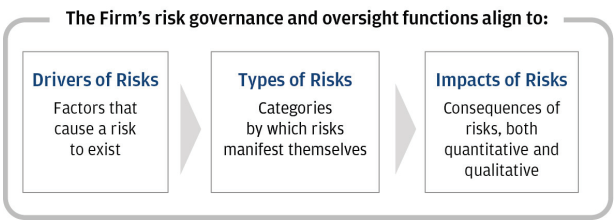
The Firm believes that effective risk management requires, among other things:

- Acceptance of responsibility, including identification and escalation of risks by all individuals within the Firm;
- Ownership of risk identification, assessment, data and management within each of the LOBs and Corporate; and
- Firmwide structures for risk governance.

The Firm follows a disciplined and balanced compensation framework with strong internal governance and independent oversight by the Board of Directors (the "Board"). The impact of risk and control issues is carefully considered in the Firm's performance evaluation and incentive compensation processes.

Risk governance and oversight framework

The Firm's risk management governance and oversight framework involves understanding drivers of risks, types of risks, and impacts of risks.



Drivers of Risks are factors that cause a risk to exist. Drivers of risks include the economic environment, regulatory and government policy, competitor and market evolution, business decisions, process and judgment error, deliberate wrongdoing, dysfunctional markets, and natural disasters.

Types of Risks are categories by which risks manifest themselves. Risks are generally categorized in the following four risk types:

- Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.
- Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.
- Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.
- Operational risk is the risk associated with an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems. It includes compliance, conduct, legal, and estimations and model risk.

Impacts of Risks are consequences of risks, both quantitative and qualitative. There may be many consequences of risks manifesting, including quantitative impacts such as a reduction in earnings and capital, liquidity outflows, and fines or penalties, or qualitative impacts such as reputation damage, loss of clients and customers, and regulatory and enforcement actions.

The Firm's risk governance and oversight framework is managed on a Firmwide basis. The Firm has an Independent Risk Management ("IRM") function, which consists of the Risk Management and Compliance organizations. The Chief Executive Officer ("CEO") appoints, subject to approval by the Risk Committee of the Board ("Board Risk Committee"), the Firm's Chief Risk Officer ("CRO") to lead the IRM organization and manage the risk governance structure of the Firm. The framework is subject to approval by the Board Risk Committee in the form of the Risk Governance and Oversight Policy. The Firm's CRO oversees and delegates authorities to LOB CROs, Firmwide Risk Executives ("FREs"), and the Firm's Chief Compliance Officer ("CCO"), who each establish Risk Management and Compliance organizations, set the Firm's risk governance policies and standards, and define and oversee the implementation of the Firm's risk governance. The LOB CROs are responsible for risks that arise in their LOBs, while FREs oversee risk areas that span across the individual LOBs, functions and regions.

Three lines of defense

The Firm relies upon each area of the Firm giving rise to risk to operate within the parameters identified by the IRM function, and within its own management-identified risk and control standards.

Each LOB and Treasury & CIO, including their aligned Operations, Technology and Control Management, are the Firm's "first line of defense" and own the identification of risks, as well as the design and execution of controls to manage those risks. The first line of defense is responsible for adherence to applicable laws, rules and regulations and for the implementation of the risk management structure (which may include policy, standards, limits, thresholds and controls) established by IRM.

The IRM function is independent of the businesses and is the Firm's "second line of defense." The IRM function independently assesses and challenges the first line of defense risk management practices. IRM is also responsible for its own adherence to applicable laws, rules and regulations and for the implementation of policies and standards established by IRM with respect to its own processes.

Internal Audit is an independent function that provides objective assessment on the adequacy and effectiveness of Firmwide processes, controls, governance and risk management as the "third line of defense." The Internal Audit Function is headed by the General Auditor, who reports to the Audit Committee and administratively to the CEO.

In addition, there are other functions that contribute to the Firmwide control environment but are not considered part of a particular line of defense, including Finance, Human Resources and Legal, and are responsible for adherence to applicable laws, rules and regulations and policies and standards established by IRM with respect to their own processes.

Risk identification and ownership

Each LOB and Corporate owns the ongoing identification of risks, as well as the design and execution of controls, including IRM-specified controls, to manage those risks. To support this activity, the Firm has a formal Risk Identification framework designed to facilitate each LOB and Corporate's responsibility to identify material risks inherent to the Firm, catalog them in a central repository and review the most material risks on a regular basis. The IRM function reviews and challenges the LOB and Corporate's identified risks, maintains the central repository and provides the consolidated Firmwide results to the Firmwide Risk Committee ("FRC") and Board Risk Committee.

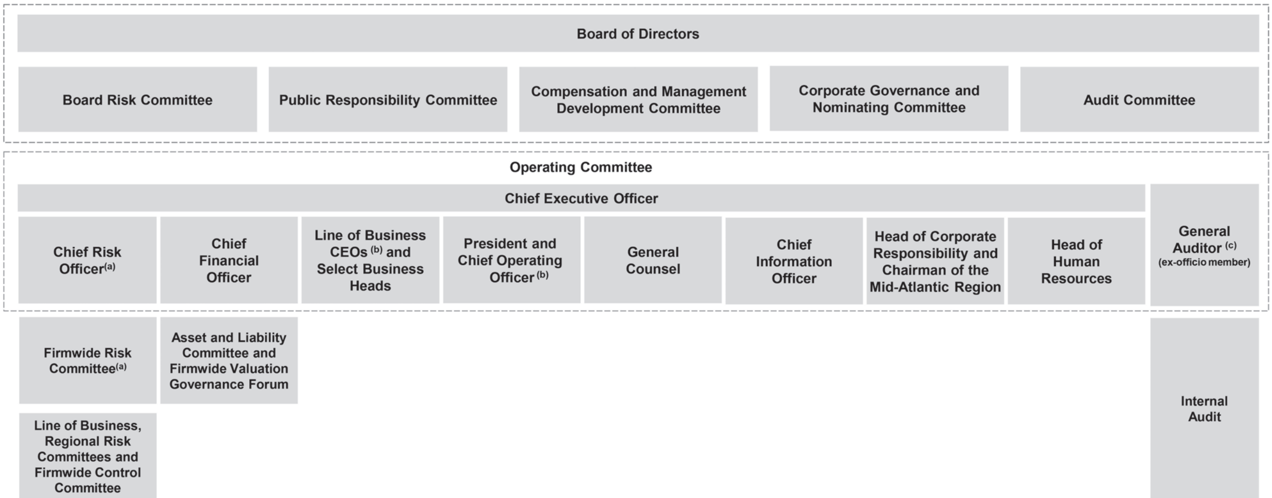
Risk appetite

The Firm's overall appetite for risk is governed by "Risk Appetite" frameworks for quantitative and qualitative risks. Periodically the Firm's risk appetite is set and approved by senior management (including the CEO and CRO) and approved by the Board Risk Committee. Quantitative and qualitative risks are assessed to monitor and measure the Firm's capacity to take risk consistent with its stated risk appetite. Risk appetite results are reported to the Board Risk Committee.

Risk governance and oversight structure

The independent status of the IRM function is supported by a governance structure that provides for escalation of risk issues to senior management, the FRC, and the Board of Directors, as appropriate.

The chart below illustrates the committees of the Board of Directors and key senior management-level committees in the Firm's risk governance structure. In addition, there are other committees, forums and paths of escalation that support the oversight of risk which are not shown in the chart below or described in this Form 10-K.



[a] The CRO may escalate directly to the Board Risk Committee. The Firmwide Risk Committee escalates significant issues directly to the Board Risk Committee as appropriate.
[b] The CEO of the Corporate & Investment Bank is also the Firm's sole President and Chief Operating Officer following the retirement of the Firm's Co-President and Co-Chief Operating Officer on December 31, 2021.
[c] The General Auditor reports to the Audit Committee and administratively to the CEO.

The Firm's Operating Committee, which consists of the Firm's CEO, CRO, CFO, General Counsel, CEOs of the LOBs and other senior executives, is accountable to and may refer matters to the Firm's Board of Directors. The Operating Committee is responsible for escalating to the Board the information necessary to facilitate the Board's exercise of its duties.

Board oversight

The Firm's Board of Directors actively oversees the business and affairs of the Firm. This includes monitoring the Firm's financial performance and condition and reviewing the strategic objectives and plans of the Firm. The Board carries out a significant portion of its oversight responsibilities through its independent, principal standing committees. The Board Risk Committee is the principal committee that oversees risk matters. The Audit Committee oversees the control environment, and the Compensation & Management Development Committee oversees compensation and other management-related matters. Each committee of the Board oversees reputational risks and conduct risks within its scope of responsibility.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of the bank. The JPMorgan Chase Bank, N.A. Board accomplishes this function acting directly and through the principal standing committees of the Firm's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank N.A. is primarily the responsibility of the Risk Committee and the Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee.

The Board Risk Committee assists the Board in its oversight of management's responsibility to implement a global risk management framework reasonably designed to identify, assess and manage the Firm's risks. The Board Risk Committee's responsibilities include approval of applicable primary risk policies and review of certain associated frameworks, analysis and reporting established by management. Breaches in risk appetite and parameters, issues that may have a material adverse impact on the Firm, including capital and liquidity issues, and other significant risk-related matters are escalated to the Board Risk Committee, as appropriate.

The Audit Committee assists the Board in its oversight of management's responsibility to ensure that there is an effective system of controls reasonably designed to safeguard the Firm's assets and income, ensure the integrity of the Firm's financial statements, and maintain compliance with the Firm's ethical standards, policies, plans and procedures, and with laws and regulations. It also assists the Board in its oversight of the Firm's independent registered public accounting firm's qualifications, independence and performance, and of the performance of the Firm's Internal Audit function.

The Compensation & Management Development Committee ("CMDC") assists the Board in its oversight of the Firm's compensation principles and practices. The CMDC reviews and approves the Firm's compensation and qualified benefits programs. The Committee reviews the performance of Operating Committee members against their goals, and approves their compensation awards. In addition, the CEO's award is subject to ratification by the independent directors of the Board. The CMDC also reviews the development of and succession for key executives. As part of the Board's role of reinforcing, demonstrating and communicating the "tone at the top", the CMDC provides oversight of the Firm's culture, including reviewing updates from management regarding significant conduct issues and any related actions with respect to employees, including compensation actions.

The Public Responsibility Committee provides oversight and review of the Firm's positions and practices on public responsibility matters such as community investment, fair lending, sustainability, consumer practices and other public policy issues that reflect the Firm's values and character and could impact the Firm's reputation among its stakeholders. The Committee also provides guidance on these matters to management and the Board, as appropriate.

The Corporate Governance & Nominating Committee exercises general oversight with respect to the governance of the Board of Directors. It reviews the qualifications of and recommends to the Board of Directors proposed nominees for election to the Board. The Committee evaluates and recommends to the Board corporate governance practices applicable to the Firm. It also appraises the framework for assessing the Board's performance and self-evaluation.

Management oversight

The Firm's senior management-level committees that are primarily responsible for key risk-related functions include:

The Firmwide Risk Committee ("FRC") is the Firm's highest management-level risk committee. It provides oversight of the risks inherent in the Firm's businesses and serves as an escalation point for risk topics and issues raised by underlying committees and/or FRC members.

The Firmwide Control Committee ("FCC") is an escalation committee for senior management to review and discuss the Firmwide operational risk environment including identified issues, operational risk metrics and significant events that have been escalated.

Line of Business and Regional Risk Committees are responsible for providing oversight of the governance, limits, and controls that are in place within the scope of their respective activities. These committees review the ways in which the particular LOB or the business operating in a particular region could be exposed to adverse outcomes with a focus on identifying, accepting, escalating and/or requiring remediation of matters brought to these committees.

Line of Business and Corporate Function Control Committees oversee the operational risk and control environment of their respective business or function, inclusive of Operational Risk, Compliance and Conduct Risks. As part of that mandate, they are responsible for reviewing indicators of elevated or emerging risks and other data that may impact the level of operating risk in a business or function, addressing key operational risk issues, with an emphasis on processes with control concerns and overseeing control remediation.

The Asset and Liability Committee ("ALCO") is responsible for overseeing the Firm's asset and liability management ("ALM"), including the activities and frameworks supporting the management of liquidity risk, balance sheet, interest rate risk, and capital risk.

The Firmwide Valuation Governance Forum ("VGF") is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm.

Risk governance and oversight functions

The Firm manages its risk through risk governance and oversight functions. The scope of a particular function may include one or more drivers, types and/or impacts of risk. For example, Country Risk Management oversees country risk which may be a driver of risk or an aggregation of exposures that could give rise to multiple risk types such as credit or market risk.

The following sections discuss the risk governance and oversight functions in place to manage the risks inherent in the Firm's business activities.

Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.

Management and oversight

The Operating Committee and the senior leadership of each LOB and Corporate are responsible for managing the Firm's most significant strategic risks. Strategic risks are overseen by IRM through participation in relevant business reviews, LOB and Corporate senior management meetings, risk and control committees and other relevant governance forums and ongoing discussions. The Board of Directors oversees management's strategic decisions, and the Board Risk Committee oversees IRM and the Firm's risk management framework.

In the process of developing business plans and strategic initiatives, LOB and Corporate senior management identify the associated risks that are incorporated into the Firmwide Risk Identification process and their impact on risk appetite.

In addition, IRM conducts a qualitative assessment of the LOB and Corporate strategic initiatives to assess their impact on the risk profile of the Firm.

The Firm's strategic planning process, which includes the development and execution of strategic initiatives, is one component of managing the Firm's strategic risk. Guided by the Firm's How We Do Business Principles (the "Principles"), the Operating Committee and senior management teams in each LOB and Corporate review and update the strategic plan periodically. The process includes evaluating the high-level strategic framework and performance against prior-year initiatives, assessing the operating environment, refining existing strategies and developing new strategies.

These strategic initiatives, along with IRM's assessment, are incorporated in the Firm's budget and provided to the Board as part of its review and approval of the Firm's strategic plan.

The Firm's balance sheet strategy, which focuses on risk-adjusted returns, strong capital and robust liquidity, is also a component in the management of strategic risk. Refer to Capital Risk Management on pages 86-96 for further information on capital risk. Refer to Liquidity Risk Management on pages 97-104 for further information on liquidity risk. Refer to Reputation Risk Management on page 105 for further information on reputation risk.

CAPITAL RISK MANAGEMENT

Capital risk is the risk the Firm has an insufficient level or composition of capital to support the Firm's business activities and associated risks during normal economic environments and under stressed conditions.

A strong capital position is essential to the Firm's business strategy and competitive position. Maintaining a strong balance sheet to manage through economic volatility is considered a strategic imperative of the Firm's Board of Directors, CEO and Operating Committee. The Firm's fortress balance sheet philosophy focuses on risk-adjusted returns, strong capital and robust liquidity. The Firm's capital risk management strategy focuses on maintaining long-term stability to enable the Firm to build and invest in market-leading businesses, including in highly stressed environments. Senior management considers the implications on the Firm's capital prior to making significant decisions that could impact future business activities. In addition to considering the Firm's earnings outlook, senior management evaluates all sources and uses of capital with a view to ensuring the Firm's capital strength.

Capital management oversight

The Firm has a Capital Management Oversight function whose primary objective is to provide independent oversight of capital risk across the Firm.

Capital Management Oversight's responsibilities include:

- Defining, monitoring and reporting capital risk metrics;
- Establishing, calibrating and monitoring capital risk limits and indicators, including capital risk appetite;
- Developing a process to classify, monitor and report capital limit breaches;
- Performing an assessment of the Firm's capital management activities, including changes made to the Contingency Capital Plan described below; and
- Conducting assessments of the Firm's regulatory capital framework intended to ensure compliance with applicable regulatory capital rules.

Capital management

Treasury & CIO is responsible for capital management.

The primary objectives of the Firm's capital management are to:

- Maintain sufficient capital in order to continue to build and invest in the Firm's businesses through the cycle and in stressed environments;
- Retain flexibility to take advantage of future investment opportunities;
- Promote the Firm's ability to serve as a source of strength to its subsidiaries;
- Ensure the Firm operates above the minimum regulatory capital ratios as well as maintain "well-capitalized" status for the Firm and its insured depository institution ("IDI") subsidiaries at all times under applicable regulatory capital requirements;
- Meet capital distribution objectives; and
- Maintain sufficient capital resources to operate throughout a resolution period in accordance with the Firm's preferred resolution strategy.

The Firm addresses these objectives through:

- Establishing internal minimum capital requirements and maintaining a strong capital governance framework. The internal minimum capital levels consider the Firm's regulatory capital requirements as well as an internal assessment of capital adequacy, in normal economic cycles and in stress events;
- Retaining flexibility in order to react to a range of potential events; and
- Regular monitoring of the Firm's capital position and following prescribed escalation protocols, both at the Firm and material legal entity levels.

Governance

Committees responsible for overseeing the Firm's capital management include the Capital Governance Committee, the ALCO as well as LOB and regional ALCOs, and the CIO, Treasury and Corporate ("CTC") Risk Committee. In addition, the Board Risk Committee periodically reviews the Firm's capital risk tolerance. Refer to Firmwide Risk Management on pages 81-84 for additional discussion on the ALCO and other risk-related committees.

Capital planning and stress testing

Comprehensive Capital Analysis and Review

The Federal Reserve requires large Bank Holding Companies ("BHCs"), including the Firm, to submit at least annually a capital plan that has been reviewed and approved by the Board of Directors. The Federal Reserve uses CCAR and other stress testing processes to ensure that large BHCs have sufficient capital during periods of economic and financial stress, and have robust, forward-looking capital assessment and planning processes in place that address each BHC's unique risks to enable it to absorb losses under certain stress scenarios. Through CCAR, the Federal Reserve evaluates each BHC's capital adequacy and internal capital adequacy assessment processes ("ICAAP"), as well as its plans to make capital distributions, such as dividend payments or stock repurchases. The Federal Reserve uses results under the severely adverse scenario from its supervisory stress test to determine each firm's Stress Capital Buffer ("SCB") requirement for the coming year.

On June 28, 2021, JPMorgan Chase announced that it had completed the 2021 CCAR stress test process. On August 5, 2021, the Federal Reserve affirmed the Firm's 2021 SCB requirement of 3.2% (down from 3.3%) and the Firm's Standardized CET1 capital ratio requirement including regulatory buffers, of 11.2% (down from 11.3%). The 2021 SCB requirement became effective on October 1, 2021 and will remain in effect until September 30, 2022.

Refer to Capital actions on page 94 for information on actions taken by the Firm's Board of Directors following the 2021 CCAR results.

Internal Capital Adequacy Assessment Process
Annually, the Firm prepares the ICAAP, which informs the Board of Directors of the ongoing assessment of the Firm's processes for managing the sources and uses of capital as well as compliance with supervisory expectations for capital planning and capital adequacy. The Firm's ICAAP integrates stress testing protocols with capital planning. The Firm's Audit Committee is responsible for reviewing and approving the capital stress testing control framework.

Stress testing assesses the potential impact of alternative economic and business scenarios on the Firm's earnings and capital. Economic scenarios, and the parameters underlying those scenarios, are defined centrally and applied uniformly across the businesses. These scenarios are articulated in terms of macroeconomic factors, which are key drivers of business results; global market shocks, which generate short-term but severe trading losses; and idiosyncratic operational risk events. The scenarios are intended to capture and stress key vulnerabilities and idiosyncratic risks facing the Firm. In addition to CCAR and other periodic stress testing, management also considers tailored stress scenarios and sensitivity analyses, as necessary.

Contingency Capital Plan

The Firm's Contingency Capital Plan establishes the capital management framework for the Firm and specifies the principles underlying the Firm's approach towards capital management in normal economic conditions and during stress. The Contingency Capital Plan defines how the Firm calibrates its targeted capital levels and meets minimum capital requirements, monitors the ongoing appropriateness of planned capital distributions, and sets out the capital contingency actions that are expected to be taken or considered at various levels of capital depletion during a period of stress.

Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's IDI subsidiaries, including JPMorgan Chase Bank, N.A. The U.S. capital requirements generally follow the Capital Accord of the Basel Committee, as amended from time to time.

Basel III Overview
The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. BHCs and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. The minimum amount of regulatory capital that must be held by BHCs and banks is determined by calculating risk-weighted assets ("RWA"), which are on-balance sheet assets and off-balance sheet exposures, weighted according to risk. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Firm is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements. The Firm's Basel III Standardized-risk-based ratios are currently more binding than the Basel III Advanced-risk-based ratios.

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, the Firm may supplement such amounts to incorporate management judgment and feedback from its regulators.

Basel III also includes a requirement for Advanced Approaches banking organizations, including the Firm, to calculate the SLR. The Firm's SLR is currently more binding than the Basel III Standardized-risk-based ratios. Refer to SLR on page 93 for additional information.

COVID-19 Pandemic
The Firm has been impacted by market events as a result of the COVID-19 pandemic, but has remained well-capitalized.

Key Regulatory Developments

CECL regulatory capital transition. The Firm elected to apply the CECL capital transition provisions as permitted by the federal banking agencies which delayed the effects of CECL on regulatory capital for two years until January 1, 2022, followed by a three-year transition period ("CECL capital transition provisions").

As of December 31, 2021, the capital metrics of the Firm reflected the benefit of the CECL capital transition provisions of $2.9 billion, which will be phased in at 25% per year beginning January 1, 2022.

The CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure and are also subject to the three-year transition period beginning January 1, 2022.

Refer to Note 1 for further information on the CECL accounting guidance.

Paycheck Protection Program. The federal banking agencies issued a final rule in September 2020 to neutralize the regulatory capital effects of participating in the PPP on risk-based capital ratios by applying a zero percent risk weight to loans originated under the program. The Firm does not expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. As of December 31, 2021, the Firm had $6.7 billion of loans remaining under the program.

Total leverage exposure for purposes of calculating the SLR includes PPP loans as the Firm did not participate in the Federal Reserve's Paycheck Protection Program Lending Facility, which would have allowed the Firm to exclude them under the final rule.

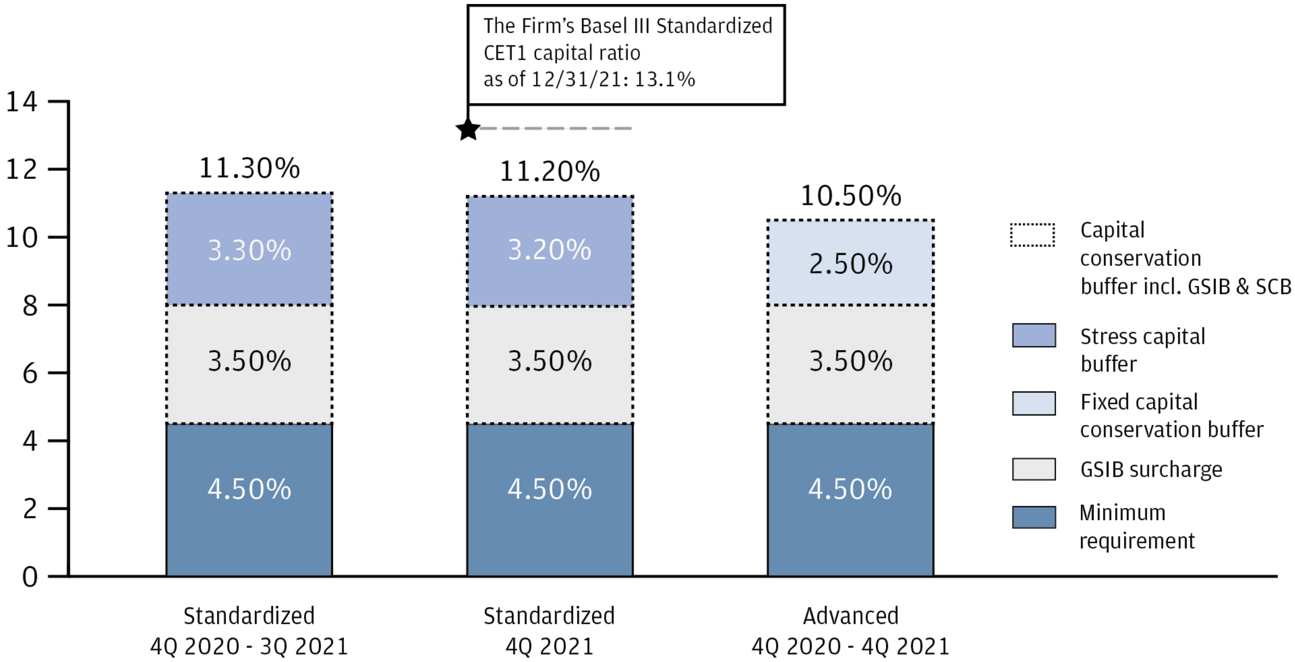
TLAC Holdings rule. On October 20, 2020, the federal banking agencies issued a final rule prescribing the regulatory capital treatment for holdings of Total Loss-Absorbing Capacity ("TLAC") debt instruments by certain large banking organizations, such as the Firm and JPMorgan Chase Bank, N.A. This rule expanded the scope of the prior capital deductions rule relating to the holdings of capital instruments of financial institutions to also include TLAC debt instruments issued by systemically important banking organizations. The final rule became effective April 1, 2021 and did not have a material impact on the Firm's risk-based capital metrics.

Standardized Approach for Counterparty Credit Risk. In November 2019, the U.S. banking regulators adopted a rule implementing "Standardized Approach for Counterparty Credit Risk" ("SA-CCR"), which replaced the current exposure method used to measure derivatives counterparty exposure under Standardized approach RWA, as well as leverage exposure used to calculate the SLR in the regulatory capital framework. The rule applies to Basel III Advanced Approaches banking organizations, such as the Firm and JPMorgan Chase Bank, N.A., with a mandatory compliance date of January 1, 2022.

Based on the derivatives exposure as of December 31, 2021, the adoption of SA-CCR is estimated to increase the Firm's Standardized RWA by approximately $40 billion and result in a modest decrease in its total leverage exposure. These estimates may differ from the actual impact based on the composition of the Firm's derivatives exposure as of March 31, 2022.

Risk-based Capital Regulatory Requirements

The following chart presents the Firm's Basel III CET1 capital ratio requirements under the Basel III rules currently in effect.



All banking institutions are currently required to have a minimum CET1 capital ratio of 4.5% of risk-weighted assets.

Certain banking organizations, including the Firm, are required to hold additional levels of capital to serve as a "capital conservation buffer". The capital conservation buffer incorporates a global systemically important bank ("GSIB") surcharge, a discretionary countercyclical capital buffer and a fixed capital conservation buffer of 2.5% for Advanced regulatory capital requirements and a variable SCB requirement, floored at 2.5%, for Standardized regulatory capital requirements.

Under the Federal Reserve's GSIB rule, the Firm is required to assess its GSIB surcharge on an annual basis under two separately prescribed methods based on data for the previous fiscal year-end, and is subject to the higher of the two. "Method 1", reflects the GSIB surcharge as prescribed by the Basel Committee's assessment methodology, and is calculated by the Financial Stability Board ("FSB") across five criteria: size, cross-jurisdictional activity, interconnectedness, complexity and substitutability. "Method 2", calculated by the Firm, modifies the Method 1 requirements to include a measure of short-term wholesale funding in place of substitutability, and introduces a GSIB score "multiplication factor".

The following table presents the Firm's effective GSIB surcharge for the years ended December 31, 2021 and 2020. For 2022, the Firm's effective GSIB surcharge under both Method 1 and Method 2 remains unchanged at 2.0% and 3.5%, respectively.

	2022	2021	2020
Method 1	2.0 %	2.0 %	2.5 %
Method 2	3.5 %	3.5 %	3.5 %

On November 23, 2021, the FSB released its annual GSIB list based upon data as of December 31, 2020, which announced the Firm's Method 1 GSIB surcharge of 2.5% (up from 2.0%) effective January 1, 2023, unless the Firm's Method 1 GSIB surcharge, as determined by the FSB, is lower based upon data as of December 31, 2021.

The Firm's Method 2 surcharge calculated using data as of December 31, 2020 is 4.0%, which will be effective January 1, 2023. The Firm's estimated Method 2 surcharge calculated using data as of December 31, 2021 is 4.5%. Accordingly, based on the GSIB rule currently in effect, the Firm's effective GSIB surcharge is expected to increase to 4.5% on January 1, 2024 unless the Firm's Method 2 GSIB surcharge calculation based upon data as of December 31, 2022 is lower.

The U.S. federal regulatory capital standards include a framework for setting a discretionary countercyclical capital buffer taking into account the macro financial environment in which large, internationally active banks function. As of December 31, 2021, the U.S. countercyclical capital buffer remained at 0%. The Federal Reserve will continue to review the buffer at least annually. The buffer can be increased if the Federal Reserve, FDIC and OCC determine that systemic risks are meaningfully above normal and can be calibrated up to an additional 2.5% of RWA subject to a 12-month implementation period.

Failure to maintain regulatory capital equal to or in excess of the risk-based regulatory capital minimum plus the capital conservation buffer (inclusive of the GSIB surcharge) and any countercyclical buffer will result in limitations to the amount of capital that the Firm may distribute, such as through dividends and common share repurchases, as well as certain executive discretionary bonus payments.

The Firm believes that it will operate with a Basel III Standardized CET1 capital ratio between 12.0% and 13.0% in the near term, based on the Basel III capital rules currently in effect, and with consideration for an increase in the GSIB surcharge in 2023.

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt ("eligible LTD"). Refer to TLAC on page 95 for additional information.

Leverage-based Capital Regulatory Requirements

Supplementary leverage ratio

Banking organizations subject to the Basel III Advanced approach are currently required to have a minimum SLR of 3.0%. Certain banking organizations, including the Firm, are also required to hold an additional 2.0% leverage buffer.

The SLR is defined as Tier 1 capital under Basel III divided by the Firm's total leverage exposure. Total leverage exposure is calculated by taking the Firm's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure.

Failure to maintain an SLR equal to or greater than the regulatory requirement will result in limitations on the amount of capital that the Firm may distribute such as through dividends and common share repurchases, as well as on certain executive discretionary bonus payments.

Other regulatory capital

In addition to meeting the capital ratio requirements of Basel III, the Firm and its IDI subsidiaries must also maintain minimum capital and leverage ratios in order to be "well-capitalized" under the regulations issued by the Federal Reserve and the Prompt Corrective Action ("PCA") requirements of the FDIC Improvement Act ("FDICIA"), respectively. Refer to Note 27 for additional information.

Additional information regarding the Firm's capital ratios, as well as the U.S. federal regulatory capital standards to which the Firm is subject, is presented in Note 27. Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for further information on the Firm's Basel III measures.

The following tables present the Firm's risk-based capital metrics under both the Basel III Standardized and Advanced approaches and leverage-based capital metrics.

	Standardized			Advanced		
(in millions, except ratios)	December 31, 2021[a]	December 31, 2020[a]	Capital ratio requirements[b]	December 31, 2021[a]	December 31, 2020[a]	Capital ratio requirements[b]
Risk-based capital metrics:						
CET1 capital	**$ 213,942**	$ 205,078		**$ 213,942**	$ 205,078	
Tier 1 capital	**246,162**	234,844		**246,162**	234,844	
Total capital	**274,900**	269,923		**265,796**	257,228	
Risk-weighted assets	**1,638,900**	1,560,609		**1,547,920**	1,484,431	
CET1 capital ratio	**13.1 %**	13.1 %	**11.2 %**	**13.8 %**	13.8 %	10.5 %
Tier 1 capital ratio	**15.0**	15.0	**12.7**	**15.9**	15.8	12.0
Total capital ratio	**16.8**	17.3	**14.7**	**17.2**	17.3	14.0

(a) The capital metrics reflect the CECL capital transition provisions. Additionally, loans originated under the PPP receive a zero percent risk weight.
(b) Represents minimum requirements and regulatory buffers applicable to the Firm. For the period ended December 31, 2020, the Basel III Standardized CET1, Tier 1, and Total capital ratio requirements applicable to the Firm were 11.3%, 12.8%, and 14.8%, respectively. Refer to Note 27 for additional information.

Three months ended (in millions, except ratios)	**December 31, 2021[b]**	December 31, 2020[b][c]	Capital ratio requirements[d]
Leverage-based capital metrics:			
Adjusted average assets[a]	**$ 3,782,035**	$ 3,353,319	
Tier 1 leverage ratio	**6.5 %**	7.0 %	**4.0 %**
Total leverage exposure	**$ 4,571,789**	$ 3,401,542	
SLR	**5.4 %**	6.9 %	**5.0 %**

(a) Adjusted average assets, for purposes of calculating the leverage ratios, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.
(b) The capital metrics reflect the CECL capital transition provisions.
(c) Total leverage exposure for purposes of calculating the SLR excludes U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021. The SLR excluding the relief was 5.8% for the period ended December 31, 2020.
(d) Represents minimum requirements and regulatory buffers applicable to the Firm. Refer to Note 27 for additional information.

Capital components

The following table presents reconciliations of total stockholders' equity to Basel III CET1 capital, Tier 1 capital and Total capital as of December 31, 2021 and 2020.

(in millions)		December 31, 2021		December 31, 2020
Total stockholders' equity	**$**	**294,127**	$	279,354
Less: Preferred stock		34,838		30,063
Common stockholders' equity		**259,289**		249,291
Add:				
Certain deferred tax liabilities[a]		2,499		2,453
Other CET1 capital adjustments[b]		3,351		3,486
Less:				
Goodwill		50,315		49,248
Other intangible assets		882		904
Standardized/Advanced CET1 capital		**213,942**		205,078
Preferred stock		34,838		30,063
Less: Other Tier 1 adjustments		2,618 [e]		297
Standardized/Advanced Tier 1 capital	**$**	**246,162**	$	234,844
Long-term debt and other instruments qualifying as Tier 2 capital	$	14,106	$	16,645
Qualifying allowance for credit losses[c]		15,012		18,372
Other		(380)		62
Standardized Tier 2 capital	**$**	**28,738**	$	35,079
Standardized Total capital	**$**	**274,900**	$	269,923
Adjustment in qualifying allowance for credit losses for Advanced Tier 2 capital[d]		(9,104)		(12,695)
Advanced Tier 2 capital	**$**	**19,634**	$	22,384
Advanced Total capital	**$**	**265,796**	$	257,228

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating CET1 capital.
(b) As of December 31, 2021 and 2020, the impact of the CECL capital transition provision was an increase in CET1 capital of $2.9 billion and $5.7 billion, respectively.
(c) Represents the allowance for credit losses eligible for inclusion in Tier 2 capital up to 1.25% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.
(d) Represents an adjustment to qualifying allowance for credit losses for the excess of eligible credit reserves over expected credit losses up to 0.6% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.
(e) Other Tier 1 Capital adjustments included $2.0 billion of Series Z preferred stock called for redemption on December 31, 2021 and subsequently redeemed on February 1, 2022.

Capital rollforward

The following table presents the changes in Basel III CET1 capital, Tier 1 capital and Tier 2 capital for the year ended December 31, 2021.

Year Ended December 31, (in millions)	2021
Standardized/Advanced CET1 capital at December 31, 2020	$ 205,078
Net income applicable to common equity	46,734
Dividends declared on common stock	(11,456)
Net purchase of treasury stock	(17,231)
Changes in additional paid-in capital	21
Changes related to AOCI	(8,070)
Adjustment related to AOCI[a]	2,972
Changes related to other CET1 capital adjustments[b]	(4,106)
Change in Standardized/Advanced CET1 capital	8,864
Standardized/Advanced CET1 capital at December 31, 2021	**$ 213,942**
Standardized/Advanced Tier 1 capital at December 31, 2020	$ 234,844
Change in CET1 capital[b]	8,864
Net issuance of noncumulative perpetual preferred stock	2,775 [c]
Other	(321)
Change in Standardized/Advanced Tier 1 capital	11,318
Standardized/Advanced Tier 1 capital at December 31, 2021	**$ 246,162**
Standardized Tier 2 capital at December 31, 2020	$ 35,079
Change in long-term debt and other instruments qualifying as Tier 2	(2,539)
Change in qualifying allowance for credit losses[b]	(3,360)
Other	(442)
Change in Standardized Tier 2 capital	(6,341)
Standardized Tier 2 capital at December 31, 2021	**$ 28,738**
Standardized Total capital at December 31, 2021	**$ 274,900**
Advanced Tier 2 capital at December 31, 2020	$ 22,384
Change in long-term debt and other instruments qualifying as Tier 2	(2,539)
Change in qualifying allowance for credit losses[b]	231
Other	(442)
Change in Advanced Tier 2 capital	(2,750)
Advanced Tier 2 capital at December 31, 2021	**$ 19,634**
Advanced Total capital at December 31, 2021	**$ 265,796**

(a) Includes cash flow hedges and debit valuation adjustment ("DVA") related to structured notes recorded in AOCI.
(b) Includes the impact of the CECL capital transition provisions.
(c) Net issuance of noncumulative perpetual preferred stock included $2.0 billion of Series Z preferred stock called for redemption on December 31, 2021 and subsequently redeemed on February 1, 2022.

RWA rollforward

The following table presents changes in the components of RWA under Basel III Standardized and Advanced approaches for the year ended December 31, 2021. The amounts in the rollforward categories are estimates, based on the predominant driver of the change.

Year ended December 31, 2021 (in millions)	Standardized Credit risk RWA[(d)]	Standardized Market risk RWA	Standardized Total RWA	Advanced Credit risk RWA[(d)]	Advanced Market risk RWA	Advanced Operational risk RWA	Advanced Total RWA
December 31, 2020	$ 1,464,219	$ 96,390	**$ 1,560,609**	$ 1,002,330	$ 96,910	$ 385,191	**$ 1,484,431**
Model & data changes[(a)]	(2,586)	(8,309)	**(10,895)**	(7,675)	(8,309)	–	**(15,984)**
Portfolio runoff[(b)]	(5,300)	–	**(5,300)**	(3,640)	–	–	**(3,640)**
Movement in portfolio levels[(c)]	87,119	7,367	**94,486**	56,027	6,905	20,181	**83,113**
Changes in RWA	79,233	(942)	**78,291**	44,712	(1,404)	20,181	**63,489**
December 31, 2021	**$ 1,543,452**	**$ 95,448**	**$ 1,638,900**	**$ 1,047,042**	**$ 95,506**	**$ 405,372**	**$ 1,547,920**

(a) Model & data changes refer to material movements in levels of RWA as a result of revised methodologies and/or treatment per regulatory guidance (exclusive of rule changes).
(b) Portfolio runoff for Credit risk RWA primarily reflects reduced risk from position rolloffs in legacy portfolios in Home Lending.
(c) Movement in portfolio levels (inclusive of rule changes) refers to: for Credit risk RWA, changes in book size, composition and credit quality, market movements, and deductions for excess eligible credit reserves not eligible for inclusion in Tier 2 capital; for Market risk RWA, changes in position, market movements, and changes in the Firm's regulatory multiplier from Regulatory VaR backtesting exceptions; and for Operational risk RWA, updates to cumulative losses and macroeconomic model inputs.
(d) As of December 31, 2021 and 2020, the Basel III Standardized Credit risk RWA included wholesale and retail off balance-sheet RWA of $218.5 billion and $204.3 billion, respectively; and the Basel III Advanced Credit risk RWA included wholesale and retail off balance-sheet RWA of $188.5 billion and $158.9 billion, respectively.

Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for further information on Credit risk RWA, Market risk RWA and Operational risk RWA.

Supplementary leverage ratio

The following table presents the components of the Firm's SLR.

Three months ended (in millions, except ratio)	**December 31, 2021**	December 31, 2020
Tier 1 capital	**$ 246,162**	$ 234,844
Total average assets	3,831,655	3,399,818
Less: Regulatory capital adjustments[(a)]	49,620	46,499
Total adjusted average assets[(b)]	3,782,035	3,353,319
Add: Off-balance sheet exposures[(c)]	789,754	729,978
Less: Exclusion for U.S. Treasuries and Federal Reserve Bank deposits	–	681,755
Total leverage exposure	**$ 4,571,789**	$ 3,401,542
SLR	**5.4 %**	6.9 % [(d)]

(a) For purposes of calculating the SLR, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill, other intangible assets and adjustments for the CECL capital transition provisions.
(b) Adjusted average assets used for the calculation of Tier 1 leverage ratio.
(c) Off-balance sheet exposures are calculated as the average of the three month-end spot balances on applicable regulatory exposures during the reporting quarter. Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports for additional information.
(d) The SLR excluding the relief was 5.8% for the period ended December 31, 2020.

Refer to Note 27 for JPMorgan Chase Bank, N.A.'s SLR.

Line of business equity

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. As of January 1, 2022, the Firm has changed its line of business capital allocations primarily as a result of changes in RWA for each LOB and to reflect an increase in the Firm's GSIB surcharge to 4.0% that will be effective January 1, 2023. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

The following table presents the capital allocated to each business segment.

Line of business equity (Allocated capital)

(in billions)	**January 1, 2022**	December 31, 2021	December 31, 2020
Consumer & Community Banking	**$ 50.0**	$ 50.0	$ 52.0
Corporate & Investment Bank	**103.0**	83.0	80.0
Commercial Banking	**25.0**	24.0	22.0
Asset & Wealth Management	**17.0**	14.0	10.5
Corporate	**64.3**	88.3	84.8
Total common stockholders' equity	**$ 259.3**	$ 259.3	$ 249.3

Capital actions

Common stock dividends

The Firm's common stock dividends are planned as part of the Capital Management governance framework in line with the Firm's capital management objectives.

The Firm's quarterly common stock dividend is currently $1.00 per share. The Firm's dividends are subject to approval by the Board of Directors on a quarterly basis. Refer to Note 21 and Note 26 for information regarding dividend restrictions.

The following table shows the common dividend payout ratio based on net income applicable to common equity.

Year ended December 31,	**2021**	2020	2019
Common dividend payout ratio	**25 %**	40 %	31 %

Common stock

On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. Subsequently, the Firm announced that its Board of Directors authorized a new common share repurchase program for up to $30 billion. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first and second quarters of 2021 were restricted and could not exceed the average of the Firm's net income for the four preceding calendar quarters.

On June 24, 2021, the Federal Reserve announced that the temporary restrictions on capital distributions would expire on June 30, 2021 as a result of the Firm remaining above its minimum risk-based capital requirements under the 2021 CCAR stress test. Effective July 1, 2021, the Firm became subject to the normal capital distribution restrictions provided under the regulatory capital framework. The Firm continues to be authorized to repurchase common shares under its existing common share repurchase program previously approved by the Board of Directors.

Refer to capital planning and stress testing on pages 86-87 for additional information.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	**2021**	2020[a]	2019
Total number of shares of common stock repurchased	**119.7**	50.0	213.0
Aggregate purchase price of common stock repurchases	**$ 18,448**	$ 6,397	$ 24,121

(a) On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020.

The Board of Director's authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares — for example, during internal trading blackout periods.
Refer to Part II, Item 5: Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities on page 35 of the 2021 Form 10-K for additional information regarding repurchases of the Firm's equity securities.

Preferred stock

Preferred stock dividends declared were $1.6 billion for the year ended December 31, 2021.

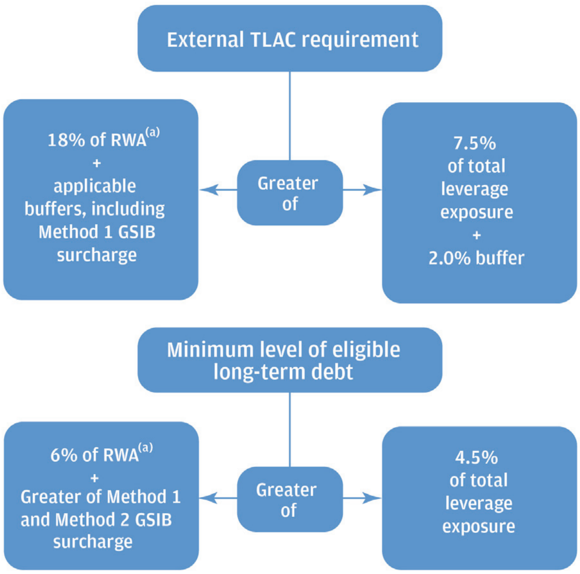
During the year ended December 31, 2021, the Firm issued and redeemed several series of non-cumulative preferred stock. Additionally, on December 31, 2021, the Firm announced the redemption of $2.0 billion of its fixed-to-floating rate non-cumulative preferred stock, Series Z and subsequently redeemed those securities on February 1, 2022. Refer to Note 21 for additional information on the Firm's preferred stock, including the issuance and redemption of preferred stock.

Other capital requirements

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt.

The external TLAC requirements and the minimum level of eligible long-term debt requirements are shown below:



(a) RWA is the greater of Standardized and Advanced compared to their respective regulatory capital ratio requirements.

Failure to maintain TLAC equal to or in excess of the regulatory minimum plus applicable buffers will result in limitations on the amount of capital that the Firm may distribute, such as through dividends and common share repurchases, as well as on certain executive discretionary bonus payments.

The following table presents the eligible external TLAC and eligible LTD amounts, as well as a representation of the amounts as a percentage of the Firm's total RWA and total leverage exposure applying the impact of the CECL capital transition provisions as of December 31, 2021 and 2020.

	December 31, 2021		December 31, 2020[a]	
(in billions, except ratio)	**External TLAC**	**LTD**	External TLAC	LTD
Total eligible amount	**$ 464.6**	**$ 210.4**	$ 421.0	$ 181.4
% of RWA	**28.4 %**	**12.8 %**	27.0 %	11.6 %
Regulatory requirements	**22.5**	**9.5**	23.0	9.5
Surplus/(shortfall)	**$ 95.9**	**$ 54.7**	$ 62.1	$ 33.1
% of total leverage exposure	**10.2 %**	**4.6 %**	12.4 %	5.3 %
Regulatory requirements	**9.5**	**4.5**	9.5	4.5
Surplus/(shortfall)	**$ 30.3**	**$ 4.6**	$ 97.9	$ 28.3

(a) Total leverage exposure excludes U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021.

Refer to Risk-based Capital Regulatory Requirements on pages 89-90 for further information on the GSIB surcharge.

Refer to Liquidity Risk Management on pages 97-104 for further information on long-term debt issued by the Parent Company.

Refer to Part I, Item 1A: Risk Factors on pages 9-33 of the 2021 Form 10-K for information on the financial consequences to holders of the Firm's debt and equity securities in a resolution scenario.

Broker-dealer regulatory capital

J.P. Morgan Securities

JPMorgan Chase's principal U.S. broker-dealer subsidiary is J.P. Morgan Securities. J.P. Morgan Securities is subject to Rule 15c3-1 under the Securities Exchange Act of 1934 (the "Net Capital Rule"). J.P. Morgan Securities is also registered as a futures commission merchant and is subject to regulatory capital requirements, including those imposed by the SEC, Commodity Futures Trading Commission ("CFTC"), Financial Industry Regulatory Authority ("FINRA") and the National Futures Association ("NFA").

J.P. Morgan Securities has elected to compute its minimum net capital requirements in accordance with the "Alternative Net Capital Requirements" of the Net Capital Rule.

The following table presents J.P. Morgan Securities' net capital:

December 31, 2021 (in millions)	Actual	Minimum
Net Capital	$ 24,581	$ 5,968

J.P. Morgan Securities registered with the SEC as a security-based swap dealer effective November 1, 2021 and continues to be registered with the CFTC as a swap dealer. As a result of additional SEC and CFTC capital and financial reporting requirements for security-based swap dealers and swap dealers, J.P. Morgan Securities is subject to alternative minimum net capital requirements and required to hold "tentative net capital" in excess of $5.0 billion (up from $1.0 billion). J.P. Morgan Securities is also required to notify the SEC and CFTC in the event that its tentative net capital is less than $6.0 billion (up from $5.0 billion). Tentative net capital is net capital before deducting market and credit risk charges as defined by the Net Capital Rule. As of December 31, 2021, J.P. Morgan Securities maintained tentative net capital in excess of the minimum and notification requirements.

J.P. Morgan Securities plc

J.P. Morgan Securities plc is a wholly-owned subsidiary of JPMorgan Chase Bank, N.A. and has authority to engage in banking, investment banking and broker-dealer activities. J.P. Morgan Securities plc is jointly regulated by the U.K. Prudential Regulation Authority ("PRA") and the Financial Conduct Authority ("FCA"). J.P. Morgan Securities plc is subject to the European Union Capital Requirements Regulation, as adopted in the U.K., and the PRA capital rules, each of which have implemented Basel III and thereby subject J.P. Morgan Securities plc to its requirements.

The Bank of England requires that U.K. banks, including U.K. regulated subsidiaries of overseas groups, maintain a minimum requirement for own funds and eligible liabilities ("MREL"). The MREL requirements were subject to a phased implementation and became fully-phased in on January 1, 2022. As of December 31, 2021, J.P. Morgan Securities plc was compliant with the fully-phased in requirements of the MREL rule.

The following table presents J.P. Morgan Securities plc's capital metrics:

December 31, 2021 (in millions, except ratios)	Estimated	Regulatory Minimum ratios[(a)]
Total capital	$ 54,818	
CET1 ratio	18.5 %	4.5 %
Total capital ratio	23.7 %	8.0 %

(a) Represents minimum requirements excluding additional capital requirements (i.e. capital buffers) specified by the PRA. J.P. Morgan Securities plc's capital ratios as of December 31, 2021 exceeded the minimum requirements, including the additional capital requirements specified by the PRA.

Liquidity risk is the risk that the Firm will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

Liquidity risk oversight

The Firm has a Liquidity Risk Oversight function whose primary objective is to provide oversight of liquidity risk across the Firm. Liquidity Risk Oversight's responsibilities include:

- Defining, monitoring and reporting liquidity risk metrics;
- Independently establishing and monitoring limits and indicators, including liquidity risk appetite;
- Developing a process to classify, monitor and report limit breaches;
- Performing an independent review of liquidity risk management processes;
- Monitoring and reporting internal Firmwide and legal entity liquidity stress tests, regulatory defined metrics, as well as liquidity positions, balance sheet variances and funding activities; and
- Approving or escalating for review new or updated liquidity stress assumptions.

Liquidity management

Treasury & CIO is responsible for liquidity management.

The primary objectives of the Firm's liquidity management are to:

- Ensure that the Firm's core businesses and material legal entities are able to operate in support of client needs and meet contractual and contingent financial obligations through normal economic cycles as well as during stress events, and
- Manage an optimal funding mix and availability of liquidity sources.

The Firm addresses these objectives through:

- Analyzing and understanding the liquidity characteristics of the assets and liabilities of the Firm, LOBs and legal entities, taking into account legal, regulatory, and operational restrictions;
- Developing internal liquidity stress testing assumptions;
- Defining and monitoring Firmwide and legal entity-specific liquidity strategies, policies, reporting and contingency funding plans;
- Managing liquidity within the Firm's approved liquidity risk appetite tolerances and limits;
- Managing compliance with regulatory requirements related to funding and liquidity risk; and
- Setting FTP in accordance with underlying liquidity characteristics of balance sheet assets and liabilities as well as certain off-balance sheet items.

As part of the Firm's overall liquidity management strategy, the Firm manages liquidity and funding using a centralized, global approach designed to:

- Optimize liquidity sources and uses;
- Monitor exposures;
- Identify constraints on the transfer of liquidity between the Firm's legal entities; and
- Maintain the appropriate amount of surplus liquidity at a Firmwide and legal entity level, where relevant.

Governance

Committees responsible for liquidity governance include the Firmwide ALCO as well as LOB and regional ALCOs, the Treasurer Committee, and the CTC Risk Committee. In addition, the Board Risk Committee reviews and recommends to the Board of Directors, for formal approval, the Firm's liquidity risk tolerances, liquidity strategy, and liquidity policy. Refer to Firmwide Risk Management on pages 81-84 for further discussion of ALCO and other risk-related committees.

Internal stress testing

Liquidity stress tests are intended to ensure that the Firm has sufficient liquidity under a variety of adverse scenarios, including scenarios analyzed as part of the Firm's resolution and recovery planning. Stress scenarios are produced for JPMorgan Chase & Co. ("Parent Company") and the Firm's material legal entities on a regular basis, and other stress tests are performed in response to specific market events or concerns. Liquidity stress tests assume all of the Firm's contractual financial obligations are met and take into consideration:

- Varying levels of access to unsecured and secured funding markets;
- Estimated non-contractual and contingent cash outflows; and
- Potential impediments to the availability and transferability of liquidity between jurisdictions and material legal entities such as regulatory, legal or other restrictions.

Liquidity outflow assumptions are modeled across a range of time horizons and currency dimensions and contemplate both market and idiosyncratic stresses.

Results of stress tests are considered in the formulation of the Firm's funding plan and assessment of its liquidity position. The Parent Company acts as a source of funding for the Firm through equity and long-term debt issuances, and its intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC") provides funding support to the ongoing operations of the Parent Company and its subsidiaries. The Firm maintains liquidity at the Parent Company, IHC, and operating subsidiaries at levels sufficient to comply with liquidity risk tolerances and minimum liquidity requirements, and to manage through periods of stress when access to normal funding sources may be disrupted.

Contingency funding plan

The Firm's Contingency Funding Plan ("CFP") sets out the strategies for addressing and managing liquidity resource needs during a liquidity stress event and incorporates liquidity risk limits, indicators and risk appetite tolerances. The CFP also identifies the alternative contingent funding and liquidity resources available to the Firm and its legal entities in a period of stress.

Liquidity Coverage Ratio and HQLA

The LCR rule requires that the Firm and JPMorgan Chase Bank, N.A. maintain an amount of eligible HQLA that is sufficient to meet its estimated total net cash outflows over a prospective 30 calendar-day period of significant stress. Eligible HQLA, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule. HQLA primarily consist of cash and certain high-quality liquid securities as defined in the LCR rule.

Under the LCR rule, the amount of eligible HQLA held by JPMorgan Chase Bank, N.A. that is in excess of its stand-alone 100% minimum LCR requirement, and that is not transferable to non-bank affiliates, must be excluded from the Firm's reported eligible HQLA.

Estimated net cash outflows are based on standardized stress outflow and inflow rates prescribed in the LCR rule, which are applied to the balances of the Firm's assets, sources of funds, and obligations. The LCR for both the Firm and JPMorgan Chase Bank, N.A. is required to be a minimum of 100%.

The following table summarizes the Firm and JPMorgan Chase Bank, N.A.'s average LCR for the three months ended December 31, 2021, September 30, 2021 and December 31, 2020 based on the Firm's interpretation of the LCR framework.

	Three months ended		
Average amount (in millions)	**December 31, 2021**	September 30, 2021	December 31, 2020
JPMorgan Chase & Co.:			
HQLA			
Eligible cash[(a)]	**$ 703,384**	$ 690,013	$ 455,612
Eligible securities[(b)(c)]	**34,738**	34,049	241,447
Total HQLA[(d)]	**$ 738,122**	$ 724,062	$ 697,059
Net cash outflows	**$ 664,801**	$ 645,557	$ 634,037
LCR	**111 %**	112 %	110 %
Net excess eligible HQLA[(d)]	**$ 73,321**	$ 78,505	$ 63,022
JPMorgan Chase Bank, N.A.:			
LCR	**178 %**	174 %	160 %
Net excess eligible HQLA	**$ 555,300**	$ 516,374	$ 401,903

(a) Represents cash on deposit at central banks, primarily the Federal Reserve Banks.
(b) Predominantly U.S. Treasuries, U.S. GSE and government agency MBS, and sovereign bonds net of applicable haircuts under the LCR rule.
(c) Eligible HQLA securities may be reported in securities borrowed or purchased under resale agreements, trading assets, or investment securities on the Firm's Consolidated balance sheets.
(d) Excludes average excess eligible HQLA at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates.

The Firm's average LCR increased during the three months ended December 31, 2021, compared with the prior year period primarily due to long-term debt issuances.

JPMorgan Chase Bank, N.A.'s average LCR increased during the three months ended December 31, 2021, compared with both the three month periods ended September 30, 2021 and December 31, 2020 primarily due to growth in deposits. The increase in excess liquidity in JPMorgan Chase Bank, N.A. is excluded from the Firm's reported LCR under the LCR rule.

The Firm and JPMorgan Chase Bank, N.A.'s average LCR fluctuates from period to period, due to changes in its eligible HQLA and estimated net cash outflows as a result of ongoing business activity. Refer to the Firm's U.S. LCR Disclosure reports, which are available on the Firm's website, for a further discussion of the Firm's LCR.

Other liquidity sources

In addition to the assets reported in the Firm's eligible HQLA discussed above, the Firm had unencumbered marketable securities, such as equity and debt securities, that the Firm believes would be available to raise liquidity. This includes excess eligible HQLA securities at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates. The fair value of these securities was approximately $914 billion and $740 billion as of December 31, 2021 and 2020, respectively, although the amount of liquidity that could be raised at any particular time would be dependent on prevailing market conditions. The fair value increased compared to December 31, 2020, due to an increase in excess eligible HQLA at JPMorgan Chase Bank, N.A. which was primarily a result of increased deposits.

The Firm also had available borrowing capacity at FHLBs and the discount window at the Federal Reserve Bank as a result of collateral pledged by the Firm to such banks of approximately $308 billion and $307 billion as of December 31, 2021 and 2020, respectively. This borrowing capacity excludes the benefit of cash and securities reported in the Firm's eligible HQLA or other unencumbered securities that are currently pledged at the Federal Reserve Bank discount window and other central banks. Although available, the Firm does not view this borrowing capacity at the Federal Reserve Bank discount window and the other central banks as a primary source of liquidity.

NSFR

The net stable funding ratio ("NSFR") is a liquidity requirement for large banking organizations that is intended to measure the adequacy of "available" and "required" amounts of stable funding over a one-year horizon. On October 20, 2020, the federal banking agencies issued a final NSFR rule under which large banking organizations such as the Firm and JPMorgan Chase Bank, N.A. are required to maintain an NSFR of at least 100% on an ongoing basis. The final NSFR rule became effective on July 1, 2021, and the Firm will be required to publicly disclose its quarterly average NSFR semi-annually beginning in 2023.

As of December 31, 2021, the Firm and JPMorgan Chase Bank, N.A. were compliant with the 100% minimum NSFR, based on the Firm's current understanding of the final rule.

Funding

Sources of funds

Management believes that the Firm's unsecured and secured funding capacity is sufficient to meet its on- and off-balance sheet obligations, which includes both short- and long-term cash requirements.

The Firm funds its global balance sheet through diverse sources of funding including stable deposits, secured and unsecured funding in the capital markets and stockholders' equity. Deposits are the primary funding source for JPMorgan Chase Bank, N.A. Additionally, JPMorgan Chase Bank, N.A. may access funding through short- or long-term secured borrowings, through the issuance of unsecured long-term debt, or from borrowings from the IHC. The Firm's non-bank subsidiaries are primarily funded from long-term unsecured borrowings and short-term secured borrowings, primarily securities loaned or sold under repurchase agreements. Excess funding is invested by Treasury and CIO in the Firm's investment securities portfolio or deployed in cash or other short-term liquid investments based on their interest rate and liquidity risk characteristics.

Refer to Note 28 for additional information on off-balance sheet obligations.

Deposits

The table below summarizes, by LOB and Corporate, the period-end and average deposit balances as of and for the years ended December 31, 2021 and 2020.

As of or for the year ended December 31,			Average	
(in millions)	**2021**	2020	**2021**	2020
Consumer & Community Banking	**$ 1,148,110**	$ 958,706	**$ 1,054,956**	$ 851,390
Corporate & Investment Bank	**707,791**	702,215	**760,048**	655,095
Commercial Banking	**323,954**	284,263	**301,343**	237,645
Asset & Wealth Management	**282,052**	198,755	**230,296**	161,955
Corporate	**396**	318	**511**	666
Total Firm	**$ 2,462,303**	$ 2,144,257	**$ 2,347,154**	$ 1,906,751

Deposits provide a stable source of funding and reduce the Firm's reliance on the wholesale funding markets. A significant portion of the Firm's deposits are consumer deposits and wholesale operating deposits, which are both considered to be stable sources of liquidity. Wholesale operating deposits are considered to be stable sources of liquidity because they are generated from customers that maintain operating service relationships with the Firm. Furthermore, certain deposits are covered by insurance protection that provides additional funding stability and results in a benefit to the LCR. Deposit insurance protection may be available to depositors in the countries in which the deposits are placed. For example, the Federal Deposit Insurance Corporation ("FDIC") provides deposit insurance protection for deposits placed in a U.S. Depository Institution. At December 31, 2021 and 2020, the Firmwide estimated uninsured deposits were $1,489.6 billion and $1,275.9 billion, respectively, primarily reflecting wholesale operating deposits.

Total uninsured deposits include time deposits. The table below presents an estimate of uninsured U.S. and non-U.S. time deposits, and their remaining maturities. The Firm's estimates of its uninsured U.S. time deposits are based on data that the Firm calculates periodically under applicable FDIC regulations. For purposes of this presentation, all non-U.S. time deposits are deemed to be uninsured.

	December 31, 2021		December 31, 2020	
(in millions)	U.S.	Non-U.S.	U.S.	Non-U.S.
Three months or less	**$ 29,359**	**$ 49,342**	$ 23,468	$ 45,648
Over three months but within 6 months	**6,235**	**2,172**	4,115	1,887
Over six months but within 12 months	**913**	**459**	3,158	675
Over 12 months	**526**	**2,562**	738	2,566
Total	**$ 37,033**	**$ 54,535**	$ 31,479	$ 50,776

The table below shows the loan and deposit balances, the loans-to-deposits ratios, and deposits as a percentage of total liabilities, as of December 31, 2021 and 2020.

As of December 31, (in billions except ratios)	**2021**	2020
Deposits	**$ 2,462.3**	$ 2,144.3
Deposits as a % of total liabilities	**71 %**	69 %
Loans	**1,077.7**	1,012.9
Loans-to-deposits ratio	**44 %**	47 %

The Firm believes that average deposit balances are generally more representative of deposit trends than period-end deposit balances, over time. However, during periods of market disruption those trends could be affected.

Average deposits increased for the year ended December 31, 2021, reflecting significant inflows across the LOBs primarily driven by the effect of certain government actions in response to the COVID-19 pandemic. In CCB, the increase was also driven by growth from existing and new accounts across both consumer and small business customers.

Refer to the discussion of the Firm's Business Segment Results and the Consolidated Balance Sheets Analysis on pages 61-80 and pages 55-56, respectively, for further information on deposit and liability balance trends.

The following table provides a summary of the average balances and average interest rates of JPMorgan Chase's deposits for the years ended December 31, 2021, 2020, and 2019.

(Unaudited) Year ended December 31,	Average balances			Average interest rates		
(in millions, except interest rates)	**2021**	2020	2019	**2021**	2020	2019
U.S. offices						
Noninterest-bearing	**$ 625,974**	$ 495,722	$ 386,116	**NA**	NA	NA
Interest-bearing						
Demand[(a)]	**324,917**	269,888	195,350	**0.06 %**	0.25 %	1.42 %
Savings[(b)]	**950,267**	739,916	602,728	**0.06**	0.13	0.46
Time	**48,628**	59,053	52,415	**0.26**	1.10	2.56
Total interest-bearing deposits	**1,323,812**	1,068,857	850,493	**0.07**	0.21	0.81
Total deposits in U.S. offices	**1,949,786**	1,564,579	1,236,609	**0.05**	0.15	0.56
Non-U.S. offices						
Noninterest-bearing	**26,315**	21,805	21,103	**NA**	NA	NA
Interest-bearing						
Demand	**313,304**	267,545	217,979	**(0.10)**	–	0.59
Savings	**–**	–	–	**–**	–	–
Time	**57,749**	52,822	47,376	**(0.09)**	0.13	1.64
Total interest-bearing deposits	**371,053**	320,367	265,355	**(0.10)**	0.02	0.78
Total deposits in non-U.S. offices	**397,368**	342,172	286,458	**(0.09)**	0.02	0.72
Total deposits	**$ 2,347,154**	$ 1,906,751	$ 1,523,067	**0.02 %**	0.12 %	0.59 %

(a) Includes Negotiable Order of Withdrawal ("NOW") accounts, and certain trust accounts.
(b) Includes Money Market Deposit Accounts ("MMDAs").

Refer to Note 17 for additional information on deposits.

The following table summarizes short-term and long-term funding, excluding deposits, as of December 31, 2021 and 2020, and average balances for the years ended December 31, 2021 and 2020. Refer to the Consolidated Balance Sheets Analysis on pages 55-56 and Note 11 for additional information.

Sources of funds (excluding deposits)

As of or for the year ended December 31,			Average	
(in millions)	**2021**	2020	**2021**	2020
Commercial paper	**$ 15,108**	$ 12,031	**$ 12,285**	$ 12,129
Other borrowed funds	**9,999**	8,510	**12,903**	9,198
Federal funds purchased	**1,769**	2,446	**$ 2,197**	2,531
Total short-term unsecured funding	**$ 26,876**	$ 22,987	**$ 27,385**	$ 23,858
Securities sold under agreements to repurchase[(a)]	**$ 189,806**	$ 207,877	**$ 250,229**	$ 246,354
Securities loaned[(a)]	**2,765**	4,886	**6,876**	6,536
Other borrowed funds	**28,487**	24,667 [(f)]	**28,138** [(f)]	23,812 [(f)]
Obligations of Firm-administered multi-seller conduits[(b)]	**6,198**	10,523	**9,283**	11,430
Total short-term secured funding	**$ 227,256**	$ 247,953	**$ 294,526**	$ 288,132
Senior notes	**$ 191,488**	$ 166,089	**$ 181,290**	$ 171,509
Subordinated debt	**20,531**	21,608	**20,877**	20,789
Structured notes[(c)]	**73,956**	75,325	**75,152**	73,056
Total long-term unsecured funding	**$ 285,975**	$ 263,022	**$ 277,319**	$ 265,354
Credit card securitization[(b)]	**$ 2,397**	$ 4,943	**$ 3,156**	$ 5,520
FHLB advances	**11,110**	14,123	**12,174**	27,076
Other long-term secured funding[(d)]	**3,920**	4,540	**4,384**	4,460
Total long-term secured funding	**$ 17,427**	$ 23,606	**$ 19,714**	$ 37,056
Preferred stock[(e)]	**$ 34,838**	$ 30,063	**$ 33,027**	$ 29,899
Common stockholders' equity[(e)]	**$ 259,289**	$ 249,291	**$ 250,968**	$ 236,865

(a) Primarily consists of short-term securities loaned or sold under agreements to repurchase.
(b) Included in beneficial interests issued by consolidated variable interest entities on the Firm's Consolidated balance sheets.
(c) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.
(d) Includes long-term structured notes which are secured.
(e) Refer to Capital Risk Management on pages 86-96, Consolidated statements of changes in stockholders' equity on page 163, Note 21 and Note 22 for additional information on preferred stock and common stockholders' equity.
(f) Includes nonrecourse advances provided under the Money Market Mutual Fund Liquidity Facility.

Short-term funding

The Firm's sources of short-term secured funding primarily consist of securities loaned or sold under agreements to repurchase. These instruments are secured predominantly by high-quality securities collateral, including government-issued debt and U.S. GSE and government agency MBS. Securities sold under agreements to repurchase decreased at December 31, 2021, compared with December 31, 2020, due to lower secured financing of AFS investment securities in Treasury and CIO, and trading assets in CIB Markets.

The balances associated with securities loaned or sold under agreements to repurchase fluctuate over time due to investment and financing activities of clients, the Firm's demand for financing, the ongoing management of the mix of the Firm's liabilities, including its secured and unsecured financing (for both the investment securities and market-making portfolios), and other market and portfolio factors.

The Firm's sources of short-term unsecured funding primarily consist of issuances of wholesale commercial paper and other borrowed funds. The increase in commercial paper at December 31, 2021, from December 31, 2020 was due to higher net issuance primarily for short-term liquidity management.

The increase in unsecured other borrowed funds at December 31, 2021 from December 31, 2020, and for the average year ended December 31, 2021 compared to the prior year period, was primarily due to net issuances of structured notes.

Long-term funding and issuance

Long-term funding provides an additional source of stable funding and liquidity for the Firm. The Firm's long-term funding plan is driven primarily by expected client activity, liquidity considerations, and regulatory requirements, including TLAC. Long-term funding objectives include maintaining diversification, maximizing market access and optimizing funding costs. The Firm evaluates various funding markets, tenors and currencies in creating its optimal long-term funding plan.

The significant majority of the Firm's long-term unsecured funding is issued by the Parent Company to provide flexibility in support of both bank and non-bank subsidiary funding needs. The Parent Company advances substantially all net funding proceeds to its subsidiary, the IHC. The IHC does not issue debt to external counterparties. The following table summarizes long-term unsecured issuance and maturities or redemptions for the years ended December 31, 2021 and 2020. Refer to Note 20 for additional information on the IHC and long-term debt.

Long-term unsecured funding

Year ended December 31,	2021	2020	2021	2020
(Notional in millions)	Parent Company		Subsidiaries	
Issuance				
Senior notes issued in the U.S. market	**$ 39,500**	$ 25,500	**$ –**	$ 60
Senior notes issued in non-U.S. markets	**5,581**	1,355	**–**	–
Total senior notes	**45,081**	26,855	**–**	60
Subordinated debt	**–**	3,000	**–**	–
Structured notes[(a)]	**4,113**	7,596	**32,714**	24,185
Total long-term unsecured funding – issuance	**$ 49,194**	$ 37,451	**$ 32,714**	$ 24,245
Maturities/redemptions				
Senior notes	**$ 10,840**	$ 28,719	**$ 65**	$ 7,701
Subordinated debt	**9**	135	**–**	–
Structured notes	**4,694**	5,340	**33,023**	30,002
Total long-term unsecured funding – maturities/redemptions	**$ 15,543**	$ 34,194	**$ 33,088**	$ 37,703

(a) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.

The Firm can also raise secured long-term funding through securitization of consumer credit card loans and FHLB advances. The following table summarizes the securitization issuance and FHLB advances and their respective maturities or redemptions for the years ended December 31, 2021 and 2020.

Long-term secured funding

Year ended December 31,	Issuance		Maturities/Redemptions	
(in millions)	2021	2020	2021	2020
Credit card securitization	**$ –**	$ 1,000	**$ 2,550**	$ 2,525
FHLB advances	**–**	15,000	**3,011**	29,509
Other long-term secured funding[(a)]	**525**	1,130	**741**	1,048
Total long-term secured funding	**$ 525**	$ 17,130	**$ 6,302**	$ 33,082

(a) Includes long-term structured notes which are secured.

The Firm's wholesale businesses also securitize loans for client-driven transactions; those client-driven loan securitizations are not considered to be a source of funding for the Firm and are not included in the table above. Refer to Note 14 for a further description of client-driven loan securitizations.

Credit ratings

The cost and availability of financing are influenced by credit ratings. Reductions in these ratings could have an adverse effect on the Firm's access to liquidity sources, increase the cost of funds, trigger additional collateral or funding requirements and decrease the number of investors and counterparties willing to lend to the Firm. The nature and magnitude of the impact of ratings downgrades depends on numerous contractual and behavioral factors, which the Firm believes are incorporated in its liquidity risk and stress testing metrics. The Firm believes that it maintains sufficient liquidity to withstand a potential decrease in funding capacity due to ratings downgrades.

Additionally, the Firm's funding requirements for VIEs and other third-party commitments may be adversely affected by a decline in credit ratings. Refer to liquidity risk and credit-related contingent features in Note 5 for additional information on the impact of a credit ratings downgrade on the funding requirements for VIEs, and on derivatives and collateral agreements.

The credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries as of December 31, 2021 were as follows:

	JPMorgan Chase & Co.			JPMorgan Chase Bank, N.A.			J.P. Morgan Securities LLC J.P. Morgan Securities plc		
December 31, 2021	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook
Moody's Investors Service[(a)]	A2	P-1	Positive/ Stable	Aa2	P-1	Stable	Aa3	P-1	Stable
Standard & Poor's[(b)]	A-	A-2	Positive	A+	A-1	Positive	A+	A-1	Positive
Fitch Ratings[(c)]	AA-	F1+	Stable	AA	F1+	Stable	AA	F1+	Stable

(a) On July 12, 2021, Moody's revised the outlook of the Parent Company's long-term issuer rating from stable to positive. The outlook for the Parent Company's short-term issuer rating and the Firm's principal bank and non-bank subsidiaries remained unchanged at stable.

(b) On May 24, 2021, Standard & Poor's affirmed the credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries, and revised the outlook from stable to positive.

(c) On April 23, 2021, Fitch affirmed the credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries, and revised the outlook from negative to stable.

JPMorgan Chase's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings, or stock price.

Critical factors in maintaining high credit ratings include a stable and diverse earnings stream, strong capital and liquidity ratios, strong credit quality and risk management controls, and diverse funding sources. Rating agencies continue to evaluate economic and geopolitical trends, regulatory developments, future profitability, risk management practices, and litigation matters, as well as their broader ratings methodologies. Changes in any of these factors could lead to changes in the Firm's credit ratings.

REPUTATION RISK MANAGEMENT

Reputation risk is the risk that an action or inaction may negatively impact perception of the Firm's integrity and reduce confidence in the Firm's competence by various constituents, including clients, counterparties, customers, investors, regulators, employees, communities or the broader public.

Organization and management

Reputation Risk Management establishes the governance framework for managing reputation risk across the Firm's LOBs and Corporate. As reputation risk is inherently challenging to identify, manage, and quantify, a reputation risk management function is particularly important.

The Firm's reputation risk management function includes the following activities:

- Maintaining a Firmwide Reputation Risk Governance policy and standard consistent with the reputation risk framework
- Overseeing the governance execution through processes and infrastructure that support consistent identification, escalation, management and monitoring of reputation risk issues Firmwide

The types of events that result in reputation risk are wide-ranging and may be introduced by the Firm's employees and the clients, customers and counterparties with which the Firm does business. These events could result in financial losses, litigation and regulatory fines, as well as other harm to the Firm.

Governance and oversight

The Reputation Risk Governance policy establishes the principles for managing reputation risk for the Firm. It is the responsibility of employees in each LOB and Corporate to consider the reputation of the Firm when deciding whether to offer a new product, engage in a transaction or client relationship, enter a new jurisdiction, initiate a business process or consider any other activity. Sustainability, social responsibility and environmental impacts are important considerations in assessing the Firm's reputation risk, and are a component of the Firm's reputation risk governance.

Reputation risk issues deemed material are escalated as appropriate.

CREDIT AND INVESTMENT RISK MANAGEMENT

Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.

Credit risk management

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer. The Firm provides credit to a variety of customers, ranging from large corporate and institutional clients to individual consumers and small businesses. In its consumer businesses, the Firm is exposed to credit risk primarily through its home lending, credit card, auto, and business banking businesses. In its wholesale businesses, the Firm is exposed to credit risk through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through its operating services activities (such as cash management and clearing activities), and securities financing activities. The Firm is also exposed to credit risk through its investment securities portfolio and cash placed with banks.

Credit Risk Management monitors, measures and manages credit risk throughout the Firm and defines credit risk policies and procedures. The Firm's credit risk management governance includes the following activities:

- Maintaining a credit risk policy framework
- Monitoring, measuring and managing credit risk across all portfolio segments, including transaction and exposure approval
- Setting industry and geographic concentration limits, as appropriate, and establishing underwriting guidelines
- Assigning and managing credit authorities in connection with the approval of credit exposure
- Managing criticized exposures and delinquent loans, and
- Estimating credit losses and supporting appropriate credit risk-based capital management

Risk identification and measurement

To measure credit risk, the Firm employs several methodologies for estimating the likelihood of obligor or counterparty default. Methodologies for measuring credit risk vary depending on several factors, including type of asset (e.g., consumer versus wholesale), risk measurement parameters (e.g., delinquency status and borrower's credit score versus wholesale risk-rating) and risk management and collection processes (e.g., retail collection center versus centrally managed workout groups). Credit risk measurement is based on the probability of default of an obligor or counterparty, the loss severity given a default event and the exposure at default.

Based on these factors and the methodology and estimates described in Note 13 and Note 10, the Firm estimates credit losses for its exposures. The allowance for loan losses reflects estimated credit losses related to the consumer and wholesale held-for-investment loan portfolios, the allowance for lending-related commitments reflects estimated credit losses related to the Firm's lending-related commitments and the allowance for investment securities reflects estimated credit losses related to the investment securities portfolio. Refer to Note 13, Note 10 and Critical Accounting Estimates used by the Firm on pages 150-153 for further information.

In addition, potential and unexpected credit losses are reflected in the allocation of credit risk capital and represent the potential volatility of actual losses relative to the established allowances for loan losses and lending-related commitments. The analyses for these losses include stress testing that considers alternative economic scenarios as described below.

Stress testing

Stress testing is important in measuring and managing credit risk in the Firm's credit portfolio. The stress testing process assesses the potential impact of alternative economic and business scenarios on estimated credit losses for the Firm. Economic scenarios and the underlying parameters are defined centrally, articulated in terms of macroeconomic factors and applied across the businesses. The stress test results may indicate credit migration, changes in delinquency trends and potential losses in the credit portfolio. In addition to the periodic stress testing processes, management also considers additional stresses outside these scenarios, including industry and country-specific stress scenarios, as necessary. The Firm uses stress testing to inform decisions on setting risk appetite both at a Firm and LOB level, as well as to assess the impact of stress on individual counterparties.

Risk monitoring and management

The Firm has developed policies and practices that are designed to preserve the independence and integrity of the approval and decision-making process for extending credit to ensure credit risks are assessed accurately, approved properly, monitored regularly and managed actively at both the transaction and portfolio levels. The policy framework establishes credit approval authorities, concentration limits, risk-rating methodologies, portfolio review parameters and guidelines for management of distressed exposures. In addition, certain models, assumptions and inputs used in evaluating and monitoring credit risk are independently validated by groups that are separate from the LOBs.

Consumer credit risk is monitored for delinquency and other trends, including any concentrations at the portfolio level, as certain of these trends can be addressed through changes in underwriting policies and portfolio guidelines. Consumer Risk Management evaluates delinquency and other trends against business expectations, current and forecasted economic conditions, and industry benchmarks. Historical and forecasted economic performance and trends are incorporated into the modeling of estimated consumer credit losses and are part of the monitoring of the credit risk profile of the portfolio.

Wholesale credit risk is monitored regularly at an aggregate portfolio, industry, and individual client and counterparty level with established concentration limits that are reviewed and revised periodically as deemed appropriate by management. Industry and counterparty limits, as measured in terms of exposure and economic risk appetite, are subject to stress-based loss constraints. Wrong-way risk is the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing.

Management of the Firm's wholesale credit risk exposure is accomplished through a number of means, including:

- Loan underwriting and credit approval processes
- Loan syndications and participations
- Loan sales and securitizations
- Credit derivatives
- Master netting agreements, and
- Collateral and other risk-reduction techniques

In addition to Credit Risk Management, an independent Credit Review function is responsible for:

- Independently validating or changing the risk grades assigned to exposures in the Firm's wholesale credit portfolio, and assessing the timeliness of risk grade changes initiated by responsible business units; and
- Evaluating the effectiveness of the credit management processes of the LOBs and Corporate, including the adequacy of credit analyses and risk grading/loss given default ("LGD") rationales, proper monitoring and management of credit exposures, and compliance with applicable grading policies and underwriting guidelines.

Refer to Note 12 for further discussion of consumer and wholesale loans.

Risk reporting

To enable monitoring of credit risk and effective decision-making, aggregate credit exposure, credit quality forecasts, concentration levels and risk profile changes are reported regularly to senior members of Credit Risk Management. Detailed portfolio reporting of industry, clients, counterparties and customers, product and geography are prepared, and the appropriateness of the allowance for credit losses is reviewed by senior management at least on a quarterly basis. Through the risk reporting and governance structure, credit risk trends and limit exceptions are provided regularly to, and discussed with, risk committees, senior management and the Board of Directors.

CREDIT PORTFOLIO

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer.

In the following tables, total loans include loans retained (i.e., held-for-investment); loans held-for-sale; and certain loans accounted for at fair value. The following tables do not include loans which the Firm accounts for at fair value and classifies as trading assets; refer to Notes 2 and 3 for further information regarding these loans. Refer to Notes 12, 28, and 5 for additional information on the Firm's loans, lending-related commitments and derivative receivables, including the Firm's related accounting policies.

Refer to Note 10 for information regarding the credit risk inherent in the Firm's investment securities portfolio; and refer to Note 11 for information regarding credit risk inherent in the securities financing portfolio. Refer to Consumer Credit Portfolio on pages 110-116 and Note 12 for further discussions of the consumer credit environment and consumer loans. Refer to Wholesale Credit Portfolio on pages 117-128 and Note 12 for further discussions of the wholesale credit environment and wholesale loans.

Total credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming[d][e]	
	2021	2020	**2021**	2020
Loans retained	**$1,010,206**	$ 960,506	**$ 6,932**	$ 8,782
Loans held-for-sale	**8,688**	7,873	**48**	284
Loans at fair value	**58,820**	44,474	**815**	1,507
Total loans	**1,077,714**	1,012,853	**7,795**	10,573
Derivative receivables	**57,081**	75,444 [c]	**316**	56
Receivables from customers[a]	**59,645**	47,710	**–**	–
Total credit-related assets	**1,194,440**	1,136,007	**8,111**	10,629
Assets acquired in loan satisfactions				
Real estate owned	**NA**	NA	**213**	256
Other	**NA**	NA	**22**	21
Total assets acquired in loan satisfactions	**NA**	NA	**235**	277
Lending-related commitments	**1,262,313**	1,165,688	**764**	577
Total credit portfolio	**$2,456,753**	$ 2,301,695	**$ 9,110**	$ 11,483
Credit derivatives and credit-related notes used in credit portfolio management activities[b][c]	**$ (22,218)**	$ (23,965)	**$ –**	$ –
Liquid securities and other cash collateral held against derivatives	**(10,102)**	(14,806)	**NA**	NA

(a) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.
(b) Represents the net notional amount of protection purchased and sold through credit derivatives and credit-related notes used to manage credit exposures.
(c) Prior-period amount has been revised to conform with the current presentation.
(d) At December 31, 2021 and 2020, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $623 million and $874 million, respectively, and real estate owned ("REO") insured by U.S. government agencies of $5 million and $9 million, respectively. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.
(e) At December 31, 2021, nonaccrual loans excluded $633 million of PPP loans 90 or more days past due and guaranteed by the SBA.

The following table provides information on Firmwide nonaccrual loans to total loans.

December 31, (in millions, except ratios)	**2021**	2020
Total nonaccrual loans	**$ 7,795**	$ 10,573
Total loans	**1,077,714**	1,012,853
Firmwide nonaccrual loans to total loans outstanding	**0.72 %**	1.04 %

The following table provides information about the Firm's net charge-offs and recoveries.

Year ended December 31, (in millions, except ratios)	**2021**	2020
Net charge-offs	**$ 2,865**	$ 5,259
Average retained loans	**965,271**	958,303
Net charge-off rates	**0.30 %**	0.55 %

Customer and client assistance

The Firm provided various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered troubled debt restructurings ("TDRs"). Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers and clients who would have otherwise moved into past due or nonaccrual status. Refer to Consumer Credit Portfolio on pages 110-116 and Wholesale Credit Portfolio on pages 117-128 for information on loan modifications as of December 31, 2021. Refer to Notes 12 and 13 for further information on the Firm's accounting policies for loan modifications and the allowance for credit losses.

Paycheck Protection Program

The PPP, established by the CARES Act and implemented by the SBA, provided the Firm with delegated authority to process and originate PPP loans. When certain criteria are met, PPP loans are subject to forgiveness and the Firm will receive payment of the forgiveness amount from the SBA. PPP loans have a contractual term of two or five years and provide borrowers with an automatic payment deferral of principal and interest. The SBA will pay accrued interest through the payment deferral period and additional interest up to a maximum of 120 days past due. Based upon these servicing guidelines, the Firm continues to accrue interest for PPP loans 90 or more days past due until delinquency reaches 120 days past due. PPP processing fees are deferred and accreted into interest income over the contractual life of the loans, but may be accelerated upon forgiveness or prepayment.

At December 31, 2021 and 2020, the Firm had $6.7 billion and $27.2 billion, respectively, of PPP loans, including $5.4 billion and $19.2 billion, respectively, in consumer, and $1.3 billion and $8.0 billion, respectively, in wholesale. The PPP ended for new applications on May 31, 2021.

As of December 31, 2021, approximately $34 billion of PPP loans have been repaid through payments of forgiveness amounts to the Firm from the SBA. During the year ended December 31, 2021, this resulted in accelerated recognition in interest income of the associated deferred processing fees, primarily in CCB.

At December 31, 2021, $633 million of PPP loans 90 or more days past due have been excluded from the Firm's nonaccrual loans as they are guaranteed by the SBA.

Refer to CCB segment results on pages 63-66 and Note 12 for a further discussion of the PPP.

CONSUMER CREDIT PORTFOLIO

The Firm's retained consumer portfolio consists primarily of residential real estate loans, credit card loans, scored auto and business banking loans, as well as associated lending-related commitments. The Firm's focus is on serving primarily the prime segment of the consumer credit market. Originated mortgage loans are retained in the residential real estate portfolio, securitized or sold to U.S. government agencies and U.S. government-sponsored enterprises; other types of consumer loans are typically retained on the balance sheet. The credit performance of the consumer portfolio, including net charge-offs continued to benefit from the improvement in the macroeconomic environment during 2021. Refer to Note 12 for further information on the consumer loan portfolio. Refer to Note 28 for further information on lending-related commitments.

The following tables present consumer credit-related information with respect to the scored credit portfolio held in CCB, AWM, CIB and Corporate.

Consumer credit portfolio

December 31, (in millions)	Credit exposure 2021	Credit exposure 2020	Nonaccrual loans[j][k][l] 2021	Nonaccrual loans[j][k][l] 2020
Consumer, excluding credit card				
Residential real estate[a]	$ **224,795**	$ 225,302	$ **4,759**	$ 5,313
Auto and other[b][c][d]	**70,761**	76,825	**119**	151
Total loans - retained	**295,556**	302,127	**4,878**	5,464
Loans held-for-sale	**1,287**	1,305	**–**	–
Loans at fair value[e]	**26,463**	15,147	**472**	1,003
Total consumer, excluding credit card loans	**323,306**	318,579	**5,350**	6,467
Lending-related commitments[f]	**45,334**	57,319		
Total consumer exposure, excluding credit card	**368,640**	375,898		
Credit Card				
Loans retained[g]	**154,296**	143,432	**NA**	NA
Loans held-for-sale	**–**	784	**NA**	NA
Total credit card loans	**154,296**	144,216	**NA**	NA
Lending-related commitments[f][h]	**730,534**	658,506		
Total credit card exposure[h]	**884,830**	802,722		
Total consumer credit portfolio[h]	$ **1,253,470**	$ 1,178,620	$ **5,350**	$ 6,467
Credit-related notes used in credit portfolio management activities[i]	$ **(2,028)**	$ (747)		

(in millions, except ratios)	Year ended December 31, Net charge-offs/(recoveries) 2021	Net charge-offs/(recoveries) 2020	Average loans - retained 2021	Average loans - retained 2020	Net charge-off/(recovery) rate[m] 2021	Net charge-off/(recovery) rate[m] 2020
Consumer, excluding credit card						
Residential real estate	$ **(275)**	$ (164)	$ **220,914**	$ 235,300	**(0.12)%**	(0.07)%
Auto and other	**286**	338	**77,900**	66,705	**0.37**	0.51
Total consumer, excluding credit card - retained	**11**	174	**298,814**	302,005	**–**	0.06
Credit card - retained	**2,712**	4,286	**139,900**	146,391	**1.94**	2.93
Total consumer - retained	$ **2,723**	$ 4,460	$ **438,714**	$ 448,396	**0.62 %**	0.99 %

(a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in Corporate.
(b) At December 31, 2021 and 2020, excluded operating lease assets of $17.1 billion and $20.6 billion, respectively. These operating lease assets are included in other assets on the Firm's Consolidated balance sheets. Refer to Note 18 for further information.
(c) Includes scored auto and business banking loans and overdrafts.
(d) At December 31, 2021 and 2020, included $5.4 billion and $19.2 billion of loans, respectively, in Business Banking under the PPP. The Firm does not expect to realize material credit losses on PPP loans because the loans are guaranteed by the SBA. Refer to Credit Portfolio on pages 108-109 for a further discussion of the PPP.
(e) Includes scored mortgage loans held in CCB and CIB.
(f) Credit card, home equity and certain business banking lending-related commitments represent the total available lines of credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit would be used at the same time. For credit card commitments, and if certain conditions are met, home equity commitments and certain business banking commitments, the Firm can reduce or cancel these lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to Note 28 for further information.
(g) Includes billed interest and fees.
(h) Also includes commercial card lending-related commitments primarily in CB and CIB.
(i) Represents the notional amount of protection obtained through the issuance of credit-related notes that reference certain pools of residential real estate and auto loans in the retained consumer portfolio.
(j) At December 31, 2021 and 2020, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $623 million and $874 million, respectively. These amounts have been excluded from nonaccrual loans based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status, as permitted by regulatory guidance.
(k) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.
(l) At December 31, 2021, nonaccrual loans excluded $506 million of PPP loans 90 or more days past due and guaranteed by the SBA.
(m) Average consumer loans held-for-sale and loans at fair value were $29.1 billion and $18.3 billion for the years ended December 31, 2021 and 2020, respectively. These amounts were excluded when calculating net charge-off/(recovery) rates.

Maturities and sensitivity to changes in interest rates

The table below sets forth loan maturities and the distribution between fixed and floating interest rates based on the stated terms of the loan agreements.

December 31, 2021 (in millions)	Within 1 year	1-5 years	5-15 years	After 15 years	Total
Consumer, excluding credit card					
Residential real estate	$ 132	$ 615	$ 21,481	$ 230,078	$ 252,306
Auto and other	3,819 (b)	42,370	24,771	40	71,000
Total consumer, excluding credit card loans	3,951	42,985	46,252	230,118	323,306
Total credit card loans	153,354	942 (a)	–	–	154,296
Total consumer loans	$ 157,305	$ 43,927	$ 46,252	$ 230,118	$ 477,602
Loans due after one year at fixed interest rates					
Residential real estate		$ 388	$ 10,991	$ 155,510	
Auto and other		42,275	24,376	36	
Credit card		942	–	–	
Loans due after one year at variable interest rates(a)					
Residential real estate		227	10,490	74,568	
Auto and other		95	395	4	
Total consumer loans		$ 43,927	$ 46,252	$ 230,118	

(a) Credit card loans with maturities greater than one year represent TDRs and are at fixed interest rates. There are no credit card loans due after one year at variable interest rates.
(b) Includes overdrafts.

Consumer assistance

In March 2020, the Firm began providing assistance to customers in response to the COVID-19 pandemic, predominantly in the form of payment deferrals.

As of December 31, 2021 and 2020, the Firm had approximately $1.3 billion and $10.7 billion, respectively, of retained consumer loans under payment deferral programs, predominantly in residential real estate, compared to approximately $28.3 billion at June 30, 2020. During the fourth quarter of 2021, there were approximately $386 million of new enrollments in consumer payment deferral programs. Predominantly all borrowers that exited payment deferral programs are current. The Firm continues to monitor the credit risk associated with loans subject to payment deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments, and considers expected losses of principal and accrued interest on these loans in its allowance for credit losses.

Of the $1.3 billion of retained loans under payment deferral programs as of December 31, 2021, approximately $611 million were accounted for as TDRs prior to payment deferral and approximately $40 million were accounted for as TDRs because they did not qualify for or the Firm did not elect to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022. Borrowers that are unable to resume or continue making payments in accordance with the original or modified contractual terms of their agreements upon exit from deferral programs will be placed on nonaccrual status in line with the Firm's nonaccrual policy, except for credit cards as permitted by regulatory guidance, and the loans charged off or down in accordance with the Firm's charge-off policies. Refer to Note 12 for additional information on the Firm's nonaccrual and charge-off policies.

Consumer, excluding credit card

Portfolio analysis

Loans increased from December 31, 2020 driven by higher residential real estate loans at fair value, largely offset by lower auto and other loans.

The following discussions provide information concerning individual loan products. Refer to Note 12 for further information about this portfolio, including information about delinquencies, loan modifications and other credit quality indicators.

Residential real estate: The residential real estate portfolio, including loans held-for-sale and loans at fair value, predominantly consists of prime mortgage loans and home equity lines of credit.

Retained loans were relatively flat compared to December 31, 2020 as the decline in Home Lending driven by paydowns outpacing originations of prime mortgage loans was predominantly offset by growth in AWM. Retained nonaccrual loans decreased from December 31, 2020 reflecting improved credit performance. Net recoveries for the year ended December 31, 2021 were higher when compared with the prior year as the current year benefited from further improvement in HPI and higher reversals of prior write-downs due to prepayments as a result of the low rate environment.

Loans at fair value increased from December 31, 2020, reflecting loan purchase activity in CIB driven by higher client demand, as well as increased originations in Home Lending due to the continued low rate environment. Nonaccrual loans at fair value decreased from December 31, 2020 due to sales in CIB.

The carrying value of home equity lines of credit outstanding was $18.7 billion at December 31, 2021. This amount included $6.2 billion of HELOCs that have recast from interest-only to fully amortizing payments or have been modified and $6.0 billion of interest-only balloon HELOCs, which primarily mature after 2030. The Firm manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are exhibiting a material deterioration in their credit risk profile.

At December 31, 2021 and 2020, the carrying value of interest-only residential mortgage loans were $30.0 billion and $25.6 billion, respectively. These loans have an interest-only payment period generally followed by an adjustable-rate or fixed-rate fully amortizing payment period to maturity and are typically originated as higher-balance loans to higher-income borrowers, predominantly in AWM. The interest-only residential mortgage loan portfolio reflected net recoveries for the year ended December 31, 2021, in line with the performance of the broader prime mortgage portfolio.

The following table provides a summary of the Firm's residential mortgage portfolio insured and/or guaranteed by U.S. government agencies, predominantly loans held-for-sale and loans at fair value. The Firm monitors its exposure to certain potential unrecoverable claim payments related to government-insured loans and considers this exposure in estimating the allowance for loan losses.

(in millions)	December 31, 2021	December 31, 2020
Current	$ 689	$ 669
30-89 days past due	135	235
90 or more days past due	623	874
Total government guaranteed loans	**$ 1,447**	$ 1,778

Geographic composition and current estimated loan-to-value ratio of residential real estate loans

At December 31, 2021, $145.5 billion, or 65% of the total retained residential real estate loan portfolio, excluding mortgage loans insured by U.S. government agencies, were concentrated in California, New York, Florida, Texas and Illinois, compared with $146.6 billion, or 65% at December 31, 2020.

Average current estimated loan-to-value ("LTV") ratios have declined consistent with recent improvements in home prices and customer pay-downs.

Refer to Note 12 for information on the geographic composition and current estimated LTVs of the Firm's residential real estate loans.

Modified residential real estate loans

The following table presents information relating to modified retained residential real estate loans for which concessions have been granted to borrowers experiencing financial difficulty, which include both TDRs and modified PCD loans not accounted for as TDRs. The following table does not include loans with short-term or other insignificant modifications that are not considered concessions and, therefore, are not TDRs, or loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. Refer to Note 12 for further information on modifications for the years ended December 31, 2021 and 2020.

(in millions)	December 31, 2021	December 31, 2020
Retained loans	$ 13,251	$ 15,406
Nonaccrual retained loans[(a)]	3,938	3,899

(a) At December 31, 2021 and 2020, nonaccrual loans included $2.7 billion and $3.0 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. Refer to Note 12 for additional information about loans modified in a TDR that are on nonaccrual status.

Auto and other: The auto and other loan portfolio, including loans at fair value, predominantly consists of prime-quality scored auto and business banking loans, as well as overdrafts. The portfolio decreased when compared with December 31, 2020 due to a decrease in business banking loans largely offset by growth in the scored auto portfolio. Business Banking loans declined predominantly due to PPP loan forgiveness, partially offset by originations. The increase in the scored auto portfolio was driven by loan originations predominantly offset by paydowns. Net charge-offs for the year ended December 31, 2021 decreased when compared to the prior year driven by lower scored auto charge-offs as the current year benefited from higher vehicle collateral values and elevated consumer cash balances, partially offset by higher overdraft charge-offs. The scored auto portfolio net charge-off rates were 0.04% and 0.25% for the years ended December 31, 2021 and 2020, respectively.

Nonperforming assets

The following table presents information as of December 31, 2021 and 2020, about consumer, excluding credit card, nonperforming assets.

Nonperforming assets[(a)]

December 31, (in millions)	2021	2020
Nonaccrual loans		
Residential real estate[(b)]	$ 5,231	$ 6,316
Auto and other	119 [(c)]	151
Total nonaccrual loans	5,350	6,467
Assets acquired in loan satisfactions		
Real estate owned	112	131
Other	22	21
Total assets acquired in loan satisfactions	134	152
Total nonperforming assets	$ 5,484	$ 6,619

(a) At December 31, 2021 and 2020, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $623 million and $874 million, respectively, and REO insured by U.S. government agencies of $5 million and $9 million, respectively. These amounts have been excluded based upon the government guarantee.

(b) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

(c) At December 31, 2021, nonaccrual loans excluded $506 million of PPP loans 90 or more days past due and guaranteed by the SBA.

Nonaccrual loans

The following table presents changes in consumer, excluding credit card, nonaccrual loans for the years ended December 31, 2021 and 2020.

Nonaccrual loan activity

Year ended December 31, (in millions)	2021	2020
Beginning balance	$ 6,467	$ 3,366
Additions:		
PCD loans, upon adoption of CECL	NA	708
Other additions	2,956	5,184 [(b)]
Total additions	2,956	5,892
Reductions:		
Principal payments and other[(a)]	2,018	983
Charge-offs	229	390
Returned to performing status	1,716	1,024
Foreclosures and other liquidations	110	394
Total reductions	4,073	2,791
Net changes	(1,117)	3,101
Ending balance	$ 5,350	$ 6,467

(a) Other reductions includes loan sales.
(b) Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

Refer to Note 12 for further information about the consumer credit portfolio, including information about delinquencies, other credit quality indicators, loan modifications and loans that were in the process of active or suspended foreclosure.

Purchased credit deteriorated (“PCD”) loans

The following tables provide credit-related information for PCD loans which are reported in residential real estate.

(in millions, except ratios)	December 31, 2021	December 31, 2020
Loan delinquency[(a)]		
Current	$ 12,746	$ 16,036
30-149 days past due	331	432
150 or more days past due	664	573
Total PCD loans	$ 13,741	$ 17,041
% of 30+ days past due to total retained PCD loans	7.24 %	5.90 %
Nonaccrual loans[(b)]	$ 1,616	$ 1,609

Year ended December 31, (in millions, except ratios)	2021	2020
Net charge-offs	$ 15	$ 74
Net charge-off rate	0.10 %	0.39 %

(a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(b) Includes loans to customers that have exited COVID-19 related payment deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

Credit card

Total credit card loans increased from December 31, 2020 reflecting strong sales volume predominantly offset by higher payments. The December 31, 2021 30+ and 90+ day delinquency rates of 1.04% and 0.50%, respectively, decreased compared to the December 31, 2020 30+ and 90+ day delinquency rates of 1.68% and 0.92%, respectively. The delinquency rates continue to benefit from the ongoing impact of government stimulus and support provided to borrowers who participated in payment assistance programs. Net charge-offs decreased for the year ended December 31, 2021 compared with the prior year reflecting lower charge-offs and higher recoveries as consumer cash balances remained elevated.

Consistent with the Firm's policy, all credit card loans typically remain on accrual status until charged off. However, the Firm's allowance for loan losses includes the estimated uncollectible portion of accrued and billed interest and fee income. Refer to Note 12 for further information about this portfolio, including information about delinquencies.

Geographic and FICO composition of credit card loans

At December 31, 2021, $70.5 billion, or 46% of the total retained credit card loan portfolio, was concentrated in California, Texas, New York, Florida and Illinois, compared with $65.0 billion, or 45%, at December 31, 2020. Refer to Note 12 for additional information on the geographic and FICO composition of the Firm's credit card loans.

Modifications of credit card loans

At December 31, 2021, the Firm had $1.0 billion of credit card loans outstanding that have been modified in TDRs, which does not include loans with short-term or other insignificant modifications that are not considered TDRs, compared to $1.4 billion at December 31, 2020. Refer to Note 12 for additional information about loan modification programs to borrowers.

WHOLESALE CREDIT PORTFOLIO

In its wholesale businesses, the Firm is exposed to credit risk primarily through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through various operating services (such as cash management and clearing activities), securities financing activities and cash placed with banks. A portion of the loans originated or acquired by the Firm's wholesale businesses is generally retained on the balance sheet. The Firm distributes a significant percentage of the loans that it originates into the market as part of its syndicated loan business and to manage portfolio concentrations and credit risk. The wholesale portfolio is actively managed, in part by conducting ongoing, in-depth reviews of client credit quality and transaction structure inclusive of collateral where applicable, and of industry, product and client concentrations. Refer to the industry discussion on pages 119-123 for further information.

The Firm's wholesale credit portfolio includes exposure held in CIB, CB, AWM and Corporate, as well as risk-rated exposures held in CCB, including business banking and auto dealer exposure for which the wholesale methodology is applied when determining the allowance for credit losses.

In 2021 the credit environment continued to improve following the broad-based deterioration during the earlier stages of the COVID-19 pandemic.

As of December 31, 2021, retained loans increased $45.4 billion driven by CIB and AWM, partially offset by decreases in CCB. Lending-related commitments increased $36.6 billion, predominantly driven by net portfolio activity in CB and CIB, including an increase in held for sale commitments intended to be syndicated.

As of December 31, 2021, the investment-grade percentage of the portfolio remained relatively flat at 71%, while criticized exposure decreased $3.4 billion from $41.6 billion to $38.2 billion. The decrease in criticized exposure was driven by net portfolio activity and client-specific upgrades, primarily in Oil & Gas and Automotive, largely offset by client-specific downgrades. Nonperforming exposure decreased $1.2 billion driven by lower nonperforming loans, primarily in Oil & Gas and Individuals and Individual Entities, with net portfolio activity and client-specific upgrades partially offset by client-specific downgrades. The decrease in nonperforming loans was partially offset by increases in derivatives and lending-related commitments.

Wholesale credit portfolio

December 31, (in millions)	Credit exposure 2021	Credit exposure 2020	Nonperforming[d] 2021	Nonperforming[d] 2020
Loans retained	**$ 560,354**	$ 514,947	**$ 2,054**	$ 3,318
Loans held-for-sale	**7,401**	5,784	**48**	284
Loans at fair value	**32,357**	29,327	**343**	504
Loans	**600,112**	550,058	**2,445**	4,106
Derivative receivables	**57,081**	75,444 [c]	**316**	56
Receivables from customers[a]	**59,645**	47,710	**–**	–
Total wholesale credit-related assets	**716,838**	673,212	**2,761**	4,162
Assets acquired in loan satisfactions				
Real estate owned	**NA**	NA	**101**	125
Other	**NA**	NA	**–**	–
Total assets acquired in loan satisfactions	**NA**	NA	**101**	125
Lending-related commitments	**486,445**	449,863	**764**	577
Total wholesale credit portfolio	**$1,203,283**	$1,123,075	**$ 3,626**	$ 4,864
Credit derivatives and credit-related notes used in credit portfolio management activities[b]	**$ (20,190)**	$ (23,218) [c]	**$ –**	$ –
Liquid securities and other cash collateral held against derivatives	**(10,102)**	(14,806)	**NA**	NA

(a) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.

(b) Represents the net notional amount of protection purchased and sold through credit derivatives and credit-related notes used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. Refer to Credit derivatives on page 128 and Note 5 for additional information.

(c) Prior-period amounts have been revised to conform with the current presentation.

(d) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, predominantly all of these loans were considered performing.

Wholesale assistance

In March 2020, the Firm began providing assistance to clients in response to the COVID-19 pandemic, predominantly in the form of payment deferrals and covenant modifications.

As of December 31, 2021 and 2020, the Firm had approximately $107 million and $1.6 billion, respectively, of retained loans under payment deferral programs, compared to $16.8 billion at June 30, 2020. Predominantly all clients that exited deferral are current or have paid down their loans. The Firm continues to monitor the credit risk associated with loans subject to deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments, and considers expected losses of principal and accrued interest on these loans in its allowance for credit losses.

In addition, the Firm granted assistance in the form of covenant modifications. These types of assistance, both payment deferrals and covenant modifications, are generally not reported as TDRs, either because the modifications were insignificant or they qualified to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022. Loans under assistance continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, substantially all of these loans were considered performing.

Wholesale credit exposure – maturity and ratings profile

The following tables present the maturity and internal risk ratings profiles of the wholesale credit portfolio as of December 31, 2021 and 2020. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and takes into consideration collateral and structural support when determining the internal risk rating for each credit facility. Refer to Note 12 for further information on internal risk ratings.

	Maturity profile[e]				Ratings profile			
December 31, 2021 (in millions, except ratios)	1 year or less	After 1 year through 5 years	After 5 years	Total	Investment-grade	Noninvestment-grade	Total	Total % of IG
Loans retained	**$ 214,064**	**$ 218,176**	**$ 128,114**	**$ 560,354**	**$ 410,011**	**$ 150,343**	**$ 560,354**	**73 %**
Derivative receivables				**57,081**			**57,081**	
Less: Liquid securities and other cash collateral held against derivatives				**(10,102)**			**(10,102)**	
Total derivative receivables, net of collateral	**13,648**	**12,814**	**20,517**	**46,979**	**31,934**	**15,045**	**46,979**	**68**
Lending-related commitments	**120,929**	**340,308**	**25,208**	**486,445**	**331,116**	**155,329**	**486,445**	**68**
Subtotal	**348,641**	**571,298**	**173,839**	**1,093,778**	**773,061**	**320,717**	**1,093,778**	**71**
Loans held-for-sale and loans at fair value[a]				**39,758**			**39,758**	
Receivables from customers				**59,645**			**59,645**	
Total exposure – net of liquid securities and other cash collateral held against derivatives				**$ 1,193,181**			**$ 1,193,181**	
Credit derivatives and credit-related notes used in credit portfolio management activities[b][c][d]	**$ (7,509)**	**$ (10,414)**	**$ (2,267)**	**$ (20,190)**	**$ (15,559)**	**$ (4,631)**	**$ (20,190)**	**77 %**

	Maturity profile[e]				Ratings profile			
December 31, 2020 (in millions, except ratios)	1 year or less	After 1 year through 5 years	After 5 years	Total	Investment-grade	Noninvestment-grade	Total	Total % of IG
Loans retained	$ 183,969	$ 197,905	$ 133,073	$ 514,947	$ 379,273	$ 135,674	$ 514,947	74 %
Derivative receivables				75,444 [d]			75,444 [d]	
Less: Liquid securities and other cash collateral held against derivatives				(14,806)			(14,806)	
Total derivative receivables, net of collateral	17,750	14,478	28,410	60,638	38,941	21,697	60,638	64
Lending-related commitments	116,950	315,179	17,734	449,863	312,694	137,169	449,863	70
Subtotal	318,669	527,562	179,217	1,025,448	730,908	294,540	1,025,448	71
Loans held-for-sale and loans at fair value[a]				35,111			35,111	
Receivables from customers				47,710			47,710	
Total exposure – net of liquid securities and other cash collateral held against derivatives				$ 1,108,269			$ 1,108,269	
Credit derivatives and credit-related notes used in credit portfolio management activities[b][c][d]	$ (6,765)	$ (13,627)	$ (2,826)	$ (23,218)	$ (18,164)	$ (5,054)	$ (23,218)	78 %

(a) Loans held-for-sale are primarily related to syndicated loans and loans transferred from the retained portfolio.
(b) These derivatives do not qualify for hedge accounting under U.S. GAAP.

(c) The notional amounts are presented on a net basis by underlying reference entity and the ratings profile shown is based on the ratings of the reference entity on which protection has been purchased. Predominantly all of the credit derivatives entered into by the Firm where it has purchased protection used in credit portfolio management activities are executed with investment-grade counterparties. In addition, the Firm obtains credit protection against certain loans in the retained loan portfolio through the issuance of credit-related notes.
(d) Prior-period amounts have been revised to conform with the current presentation.
(e) The maturity profile of retained loans, lending-related commitments and derivative receivables is generally based on remaining contractual maturity. Derivative contracts that are in a receivable position at December 31, 2021, may become payable prior to maturity based on their cash flow profile or changes in market conditions.

Wholesale credit exposure – industry exposures

The Firm focuses on the management and diversification of its industry exposures, and pays particular attention to industries with actual or potential credit concerns.

Exposures deemed criticized align with the U.S. banking regulators' definition of criticized exposures, which consist of the special mention, substandard and doubtful categories. Total criticized exposure, excluding loans held-for-sale and loans at fair value, was $38.2 billion at December 31, 2021 and $41.6 billion at December 31, 2020, representing approximately 3.5% and 4.0% of total wholesale credit exposure, respectively. The decrease in criticized exposure was driven by net portfolio activity and client-specific upgrades, primarily in Oil & Gas and Automotive, largely offset by client-specific downgrades. The $38.2 billion of criticized exposure at December 31, 2021 was largely undrawn and $35.0 billion was performing.

The table below summarizes by industry the Firm's exposures as of December 31, 2021 and 2020. The industry of risk category is generally based on the client or counterparty's primary business activity. Refer to Note 4 for additional information on industry concentrations.

Wholesale credit exposure – industries[(a)]

			Noninvestment-grade			Selected metrics			
As of or for the year ended **December 31, 2021** (in millions)	Credit exposure[(f)(g)]	Investment-grade	Noncriticized	Criticized performing	Criticized nonperforming	30 days or more past due and accruing loans[(i)]	Net charge-offs/ (recoveries)	Credit derivative hedges and credit-related notes[(i)]	Liquid securities and other cash collateral held against derivative receivables
Real Estate	$ 155,069	$ 120,174	$ 29,642	$ 4,636	$ 617	$ 394	$ 6	$ (190)	$ –
Individuals and Individual Entities[(b)]	141,973	122,606	18,797	99	471	1,450	32	–	(1)
Consumer & Retail	122,789	59,622	53,317	9,445	405	288	2	(357)	–
Technology, Media & Telecommunications	84,070	49,610	25,540	8,595	325	58	(1)	(935)	(12)
Asset Managers	81,228	68,593	12,630	–	5	8	–	–	(3,900)
Industrials	66,974	36,953	26,957	2,895	169	428	13	(608)	(1)
Healthcare	59,014	42,133	15,136	1,686	59	204	(4)	(490)	(174)
Banks & Finance Cos	54,684	29,732	23,809	1,138	5	9	9	(553)	(810)
Oil & Gas	42,606	20,698	20,222	1,558	128	4	60	(582)	–
Automotive	34,573	24,606	9,446	399	122	95	(3)	(463)	–
State & Municipal Govt[(c)]	33,216	32,522	586	101	7	74	–	–	(14)
Utilities	33,203	25,069	7,011	914	209	11	6	(382)	(4)
Chemicals & Plastics	17,660	11,319	5,817	518	6	7	–	(67)	–
Metals & Mining	16,696	7,848	8,491	294	63	27	7	(15)	(4)
Transportation	14,635	6,010	5,983	2,470	172	21	20	(110)	(24)
Insurance	13,926	9,943	3,887	96	–	–	–	(25)	(2,366)
Central Govt	11,317	11,067	250	–	–	–	–	(7,053)	(72)
Financial Markets Infrastructure	4,377	3,987	390	–	–	–	–	–	–
Securities Firms	4,180	2,599	1,578	–	3	–	–	(47)	(217)
All other[(d)]	111,690	97,537	13,580	205	368	242	(5)	(8,313)	(2,503)
Subtotal	$ 1,103,880	$ 782,628	$ 283,069	$ 35,049	$ 3,134	$ 3,320	$ 142	$ (20,190)	$ (10,102)
Loans held-for-sale and loans at fair value	39,758								
Receivables from customers	59,645								
Total[(e)]	$ 1,203,283								

As of or for the year ended December 31, 2020 (in millions)			Noninvestment-grade			Selected metrics			
	Credit exposure[(f)(g)]	Investment-grade	Noncriticized	Criticized performing	Criticized nonperforming	30 days or more past due and accruing loans[(i)]	Net charge-offs/ (recoveries)	Credit derivative hedges and credit-related notes [(h)(j)]	Liquid securities and other cash collateral held against derivative receivables
Real Estate	$ 148,498	$ 116,124	$ 27,576	$ 4,294	$ 504	$ 374	$ 94	$ (190)	$ –
Individuals and Individual Entities[(b)]	122,870	107,266	14,688	227	689	1,570	(17)	–	–
Consumer & Retail	108,437	57,580	41,624	8,852	381	203	55	(381)	(5)
Technology, Media & Telecommunications	72,150	36,435	27,770	7,738	207	10	73	(984)	(56)
Asset Managers	66,573	57,582	8,885	85	21	19	1	–	(4,685)
Industrials	66,470	37,512	26,881	1,852	225	278	70	(658)	(61)
Healthcare	60,118	44,901	13,356	1,684	177	96	104	(378)	(191)
Banks & Finance Cos	54,032	35,115	17,820	1,045	52	20	13	(659)	(1,648)
Oil & Gas	39,159	18,456	14,969	4,952	782	11	249	(488)	(4)
Automotive	43,331	25,548	15,575	2,149	59	152	22	(434)	–
State & Municipal Govt[(c)]	38,286	37,705	574	2	5	41	–	–	(41)
Utilities	30,124	22,451	7,048	571	54	14	(7)	(402)	(1)
Chemicals & Plastics	17,176	10,622	5,703	822	29	6	–	(83)	–
Metals & Mining	15,542	5,958	8,699	704	181	8	16	(141)	(13)
Transportation	16,232	7,549	6,340	2,137	206	30	117	(83)	(26)
Insurance	13,141	10,177	2,960	3	1	7	–	–	(1,771)
Central Govt	17,025	16,652	373	–	–	–	–	(8,364)	(982)
Financial Markets Infrastructure	6,515	6,449	66	–	–	–	–	–	(10)
Securities Firms	8,048	6,116	1,927	1	4	–	18	(49)	(3,423)
All other[(d)]	96,527 [(h)]	84,650	10,999 [(h)]	504	374	83	(9)	(9,924)	(1,889)
Subtotal	$ 1,040,254	$ 744,848	$ 253,833	$ 37,622	$ 3,951	$ 2,922	$ 799	$ (23,218)	$ (14,806)
Loans held-for-sale and loans at fair value	35,111								
Receivables from customers	47,710								
Total[(e)]	$ 1,123,075								

(a) The industry rankings presented in the table as of December 31, 2020, are based on the industry rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.

(b) Individuals and Individual Entities predominantly consists of Global Private Bank clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.

(c) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2021 and 2020, noted above, the Firm held: $7.1 billion and $7.2 billion, respectively, of trading assets; $15.9 billion and $20.4 billion, respectively, of AFS securities; and $14.0 billion and $12.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.

(d) All other includes: SPEs and Private education and civic organizations, representing approximately 94% and 6%, respectively, at December 31, 2021 and 92% and 8%, respectively, at December 31, 2020 .

(e) Excludes cash placed with banks of $729.6 billion and $516.9 billion, at December 31, 2021 and 2020, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(f) Credit exposure is net of risk participations and excludes the benefit of credit derivatives and credit-related notes used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(g) Credit exposure includes held-for-sale and fair value option elected lending-related commitments.

(h) Prior-period amounts have been revised to conform with the current presentation.

(i) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.

(j) Represents the net notional amounts of protection purchased and sold through credit derivatives and credit-related notes used to manage the credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. The All other category includes purchased credit protection on certain credit indices.

Presented below is additional detail on certain of the Firm's industry exposures.

Real Estate

Real Estate exposure was $155.1 billion as of December 31, 2021, of which $89.2 billion was multifamily lending as shown in the table below. Criticized exposure increased by $455 million from $4.8 billion at December 31, 2020 to $5.3 billion at December 31, 2021, driven by client-specific downgrades predominantly offset by client-specific upgrades and net portfolio activity.

	December 31, 2021				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[d]
Multifamily[a]	**$ 89,032**	**$ 122**	**$ 89,154**	**84 %**	**89 %**
Office	**16,409**	**234**	**16,643**	**75**	**71**
Other Income Producing Properties[b]	**13,018**	**498**	**13,516**	**77**	**55**
Industrial	**11,546**	**66**	**11,612**	**75**	**64**
Services and Non Income Producing	**11,512**	**24**	**11,536**	**63**	**50**
Retail	**9,580**	**106**	**9,686**	**61**	**69**
Lodging	**2,859**	**63**	**2,922**	**5**	**33**
Total Real Estate Exposure[c]	**$ 153,956**	**$ 1,113**	**$ 155,069**	**77 %**	**77 %**

	December 31, 2020				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[d]
Multifamily[a]	$ 85,368	$ 183	$ 85,551	85 %	92 %
Office	16,372	475	16,847	76	70
Other Income Producing Properties[b]	13,435	421	13,856	76	55
Industrial	9,039	69	9,108	76	73
Services and Non Income Producing	9,242	22	9,264	62	47
Retail	10,573	199	10,772	60	69
Lodging	3,084	16	3,100	24	57
Total Real Estate Exposure	$ 147,113	$ 1,385	$ 148,498	78 %	80 %

(a) Multifamily exposure is largely in California.
(b) Other Income Producing Properties consists of clients with diversified property types or other property types outside of categories listed in the table above
(c) Real Estate exposure is approximately 78% secured; unsecured exposure is approximately 75% investment-grade.
(d) Represents drawn exposure as a percentage of credit exposure.

Consumer & Retail

Consumer & Retail exposure was $122.8 billion as of December 31, 2021, and predominantly included Retail, Business and Consumer Services, and Food and Beverage as shown in the table below. Criticized exposure increased by $617 million from $9.2 billion at December 31, 2020 to $9.9 billion at December 31, 2021, driven by client-specific downgrades and net portfolio activity largely offset by client-specific upgrades.

	December 31, 2021				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
Retail[(a)]	**$ 32,872**	**$ 1,152**	**$ 34,024**	**50 %**	**31 %**
Business and Consumer Services	**32,159**	**347**	**32,506**	**46**	**33**
Food and Beverage	**30,434**	**957**	**31,391**	**59**	**33**
Consumer Hard Goods	**17,035**	**111**	**17,146**	**46**	**30**
Leisure[(b)]	**7,620**	**102**	**7,722**	**17**	**34**
Total Consumer & Retail[(c)]	**$ 120,120**	**$ 2,669**	**$ 122,789**	**49 %**	**32 %**

	December 31, 2020				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
Retail[(a)]	$ 32,486	$ 887	$ 33,373	52 %	33 %
Business and Consumer Services	24,760	599	25,359	52	41
Food and Beverage	28,012	897	28,909	62	33
Consumer Hard Goods	12,937	178	13,115	59	36
Leisure[(b)]	7,440	241	7,681	18	43
Total Consumer & Retail	$ 105,635	$ 2,802	$ 108,437	53 %	36 %

(a) Retail consists of Home Improvement & Specialty Retailers, Restaurants, Supermarkets, Discount & Drug Stores, Specialty Apparel and Department Stores.
(b) Leisure consists of Gaming, Arts & Culture, Travel Services and Sports & Recreation. As of December 31, 2021, approximately 81% of the noninvestment-grade Leisure portfolio is secured.
(c) Approximately 80% of the noninvestment-grade portfolio is secured.
(d) Represents drawn exposure as a percent of credit exposure.

Oil & Gas

Oil & Gas exposure was $42.6 billion as of December 31, 2021, including $23.1 billion of Exploration & Production and Oil field Services as shown in the table below. The increase in derivative receivables resulted from market movements related to Oil & Gas prices. Criticized exposure decreased by $4.0 billion from $5.7 billion at December 31, 2020 to $1.7 billion at December 31, 2021, driven by net portfolio activity and client-specific upgrades partially offset by client-specific downgrades.

	December 31, 2021				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Exploration & Production ("E&P") and Oil field Services	**$ 17,631**	**$ 5,452**	**$ 23,083**	**39 %**	**26 %**
Other Oil & Gas[(a)]	**18,941**	**582**	**19,523**	**60**	**26**
Total Oil & Gas[(b)]	**$ 36,572**	**$ 6,034**	**$ 42,606**	**49 %**	**26 %**

	December 31, 2020				
(in millions, except ratios)	Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Exploration & Production ("E&P") and Oil field Services	$ 18,228	$ 1,048	$ 19,276	32 %	37 %
Other Oil & Gas[(a)]	19,288	595	19,883	62	21
Total Oil & Gas[(b)]	$ 37,516	$ 1,643	$ 39,159	47 %	29 %

(a) Other Oil & Gas includes Integrated Oil & Gas companies, Midstream/Oil Pipeline companies and refineries.
(b) Secured exposure was $18.0 billion and $13.2 billion at December 31, 2021 and 2020, respectively, over half of which is reserve-based lending to the Exploration & Production sub-sector; unsecured exposure is largely investment-grade.
(c) Represents drawn exposure as a percent of credit exposure.

Loans

In its wholesale businesses, the Firm provides loans to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals. Refer to Note 12 for a further discussion on loans, including information about delinquencies, loan modifications and other credit quality indicators.

The following table presents the change in the nonaccrual loan portfolio for the years ended December 31, 2021 and 2020. Since December 31, 2020, nonaccrual loan exposure decreased $1.7 billion, largely in Oil & Gas and Individuals and Individual Entities, with net portfolio activity and client-specific upgrades partially offset by client-specific downgrades.

Wholesale nonaccrual loan activity

Year ended December 31, (in millions)	2021	2020
Beginning balance	$ 4,106	$ 1,271
Additions	2,909	6,753
Reductions:		
Paydowns and other	2,676	2,290
Gross charge-offs	268	922
Returned to performing status	1,106	569
Sales	520	137
Total reductions	4,570	3,918
Net changes	(1,661)	2,835
Ending balance	$ 2,445	$ 4,106

The following table presents net charge-offs/recoveries, which are defined as gross charge-offs less recoveries, for the years ended December 31, 2021 and 2020. The amounts in the table below do not include gains or losses from sales of nonaccrual loans recognized in noninterest revenue.

Wholesale net charge-offs/(recoveries)

Year ended December 31, (in millions, except ratios)	2021	2020
Loans		
Average loans retained	$ 526,557	$ 509,907
Gross charge-offs	283	954
Gross recoveries collected	(141)	(155)
Net charge-offs/(recoveries)	142	799
Net charge-off/(recovery) rate	0.03 %	0.16 %

Maturities and sensitivity to changes in interest rates

The table below sets forth wholesale loan maturities and the distribution between fixed and floating interest rates based on the stated terms of the loan agreements by loan class. Refer to Note 12 for further information on loan classes.

December 31, 2021 (in millions, except ratios)	1 year or less[(a)]	After 1 year through 5 years	After 5 years through 15 years	After 15 years	Total
Wholesale loans:					
Secured by real estate	$ 6,587	$ 27,559	$ 28,624	$ 65,542	$ 128,312
Commercial and industrial	52,132	95,685	10,523	1,105	159,445
Other	162,600	117,886	27,427	4,442	312,355
Total wholesale loans	$ 221,319	$ 241,130	$ 66,574	$ 71,089	$ 600,112
Loans due after one year at fixed interest rates					
Secured by real estate		$ 3,762	$ 9,454	$ 2,258	
Commercial and industrial		9,129	1,025	19	
Other		18,206	16,778	3,311	
Loans due after one year at variable interest rates					
Secured by real estate		$ 23,797	$ 19,170	$ 63,285	
Commercial and industrial		86,557	9,498	1,087	
Other		99,679	10,649	1,129	
Total wholesale loans		$ 241,130	$ 66,574	$ 71,089	

(a) Includes demand loans and overdrafts.

The following table presents net charge-offs/recoveries, average retained loans and net charge-off/recovery rate by loan class for the year ended December 31, 2021 and 2020.

	Year ended December 31,							
	Secured by real estate		Commercial and industrial		Other		Total	
(in millions, except ratios)	**2021**	2020	**2021**	2020	**2021**	2020	**2021**	2020
Net charge-offs/(recoveries)	$ 13	$ 10	$ 105	$ 737	$ 24	$ 52	$ 142	$ 799
Average retained loans	118,417	122,435	138,015	162,554	270,125	224,918	526,557	509,907
Net charge-off/(recovery) rate	0.01 %	0.01 %	0.08 %	0.45 %	0.01 %	0.02 %	0.03 %	0.16 %

Lending-related commitments

The Firm uses lending-related financial instruments, such as commitments (including revolving credit facilities) and guarantees, to address the financing needs of its clients. The contractual amounts of these financial instruments represent the maximum possible credit risk should the clients draw down on these commitments or when the Firm fulfills its obligations under these guarantees, and the clients subsequently fail to perform according to the terms of these contracts. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn upon or a default occurring. As a result, the Firm does not believe that the total contractual amount of these wholesale lending-related commitments is representative of the Firm's expected future credit exposure or funding requirements. Refer to Note 28 for further information on wholesale lending-related commitments.

Receivables from customers

Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, and liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

Derivative contracts

Derivatives enable clients and counterparties to manage risk including credit risk and risks arising from fluctuations in interest rates, foreign exchange and equities and commodities prices. The Firm makes markets in derivatives in order to meet these needs and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. The Firm also uses derivative instruments to manage its own credit risk and other market risk exposure. The nature of the counterparty and the settlement mechanism of the derivative affect the credit risk to which the Firm is exposed. For OTC derivatives the Firm is exposed to the credit risk of the derivative counterparty. For exchange-traded derivatives ("ETD"), such as futures and options, and cleared over-the-counter ("OTC-cleared") derivatives, the Firm can also be exposed to the credit risk of the relevant CCP. Where possible, the Firm seeks to mitigate its credit risk exposures arising from derivative contracts through the use of legally enforceable master netting arrangements and collateral agreements. The percentage of the Firm's OTC derivative transactions subject to collateral agreements — excluding foreign exchange spot trades, which are not typically covered by collateral agreements due to their short maturity and centrally cleared trades that are settled daily — was approximately 88% at both December 31, 2021 and 2020. Refer to Note 5 for additional information on the Firm's use of collateral agreements. Refer to Note 5 for a further discussion of derivative contracts, counterparties and settlement types.

The fair value of derivative receivables reported on the Consolidated balance sheets were $57.1 billion and $75.4 billion at December 31, 2021 and 2020, respectively. The decrease was primarily driven by market movements and maturities of certain trades in CIB, partially offset by an increase in commodity derivatives. Derivative receivables represent the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and the related cash collateral held by the Firm.

In addition, the Firm held liquid securities and other cash collateral that the Firm believes is legally enforceable and may be used as security when the fair value of the client's exposure is in the Firm's favor. For these purposes, the definition of liquid securities is consistent with the definition of high quality liquid assets as defined in the LCR rule.

In management's view, the appropriate measure of current credit risk should also take into consideration other collateral, which generally represents securities that do not qualify as high quality liquid assets under the LCR rule, but that the Firm believes is legally enforceable. The collateral amounts for each counterparty are limited to the net derivative receivables for the counterparty.

The Firm also holds additional collateral (primarily cash, G7 government securities, other liquid government agency and guaranteed securities, and corporate debt and equity securities) delivered by clients at the initiation of transactions, as well as collateral related to contracts that have a non-daily call frequency and collateral that the Firm has agreed to return but has not yet settled as of the reporting date. Although this collateral does not reduce the balances and is not included in the tables below, it is available as security against potential exposure that could arise should the fair value of the client's derivative contracts move in the Firm's favor. Refer to Note 5 for additional information on the Firm's use of collateral agreements.

The following tables summarize the net derivative receivables and the internal ratings profile for the periods presented.

Derivative receivables

December 31, (in millions)	2021	2020
Total, net of cash collateral	**$ 57,081**	$ 75,444 [(a)]
Liquid securities and other cash collateral held against derivative receivables	**(10,102)**	(14,806)
Total, net of liquid securities and other cash collateral	**$ 46,979**	$ 60,638
Other collateral held against derivative receivables	**(1,544)**	(1,836) [(a)]
Total, net of collateral	**$ 45,435**	$ 58,802

(a) Prior-period amounts have been revised to conform with the current presentation.

Ratings profile of derivative receivables

December 31, (in millions, except ratios)	2021 Exposure net of collateral	2021 % of exposure net of collateral	2020 Exposure net of collateral	2020 % of exposure net of collateral
Investment-grade	**$ 30,278**	**67 %**	$ 37,013	63 %
Noninvestment-grade	**15,157**	**33**	21,789	37
Total	**$ 45,435**	**100 %**	$ 58,802	100 %

While useful as a current view of credit exposure, the net fair value of the derivative receivables does not capture the potential future variability of that credit exposure. To capture the potential future variability of credit exposure, the Firm calculates, on a client-by-client basis, three measures of potential derivatives-related credit loss: Peak, Derivative Risk Equivalent ("DRE"), and Average exposure ("AVG"). These measures all incorporate netting and collateral benefits, where applicable.

Peak represents a conservative measure of potential derivative exposure, including the benefit of collateral, to a counterparty calculated in a manner that is broadly equivalent to a 97.5% confidence level over the life of the transaction. Peak is the primary measure used by the Firm for setting credit limits for derivative contracts, senior management reporting and derivatives exposure management.

DRE exposure is a measure that expresses the risk of derivative exposure, including the benefit of collateral, on a basis intended to be equivalent to the risk of loan exposures. DRE is a less extreme measure of potential credit loss than Peak and is used as an input for aggregating derivative credit risk exposures with loans and other credit risk.

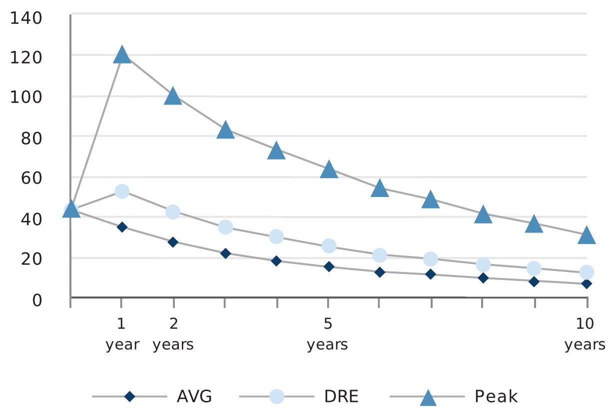
Finally, AVG is a measure of the expected fair value of the Firm's derivative exposure, including the benefit of collateral, at future time periods. AVG over the total life of the derivative contract is used as the primary metric for pricing purposes and is used to calculate credit risk capital and CVA, as further described below.

The fair value of the Firm's derivative receivables incorporates CVA to reflect the credit quality of counterparties. CVA is based on the Firm's AVG to a counterparty and the counterparty's credit spread in the credit derivatives market. The Firm believes that active risk management is essential to controlling the dynamic credit risk in the derivatives portfolio. In addition, the Firm's risk management process for derivatives exposures takes into consideration the potential impact of wrong-way risk, which is broadly defined as the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing. Many factors may influence the nature and magnitude of these correlations over time. To the extent that these correlations are identified, the Firm may adjust the CVA associated with a particular counterparty's AVG. The Firm risk manages exposure to changes in CVA by entering into credit derivative contracts, as well as interest rate, foreign exchange, equity and commodity derivative contracts.

The below graph shows exposure profiles to the Firm's current derivatives portfolio over the next 10 years as calculated by the Peak, DRE and AVG metrics. The three measures generally show that exposure will decline after the first year, if no new trades are added to the portfolio.

Exposure profile of derivatives measures

December 31, 2021
(in billions)



Credit derivatives

The Firm uses credit derivatives for two primary purposes: first, in its capacity as a market-maker, and second, as an end-user, to manage the Firm's own credit risk associated with various exposures.

Credit portfolio management activities

Included in the Firm's end-user activities are credit derivatives used to mitigate the credit risk associated with traditional lending activities (loans and lending-related commitments) and derivatives counterparty exposure in the Firm's wholesale businesses (collectively, "credit portfolio management activities"). Information on credit portfolio management activities is provided in the table below.

The Firm also uses credit derivatives as an end-user to manage other exposures, including credit risk arising from certain securities held in the Firm's market-making businesses. These credit derivatives are not included in credit portfolio management activities.

Credit derivatives and credit-related notes used in credit portfolio management activities

	Notional amount of protection purchased and sold[(a)]	
December 31, (in millions)	**2021**	2020
Credit derivatives and credit-related notes used to manage:		
Loans and lending-related commitments	**$ 4,138**	$ 4,856
Derivative receivables	**16,052**	18,362
Credit derivatives and credit-related notes used in credit portfolio management activities	**$ 20,190**	$ 23,218

(a) Amounts are presented net, considering the Firm's net protection purchased or sold with respect to each underlying reference entity or index. Prior-period amounts have been revised to conform with the current presentation.

The credit derivatives used in credit portfolio management activities do not qualify for hedge accounting under U.S. GAAP; these derivatives are reported at fair value, with gains and losses recognized in principal transactions revenue. In contrast, the loans and lending-related commitments being risk-managed are accounted for on an accrual basis. This asymmetry in accounting treatment, between loans and lending-related commitments and the credit derivatives used in credit portfolio management activities, causes earnings volatility that is not representative, in the Firm's view, of the true changes in value of the Firm's overall credit exposure.

The effectiveness of credit default swaps ("CDS") as a hedge against the Firm's exposures may vary depending on a number of factors, including the named reference entity (i.e., the Firm may experience losses on specific exposures that are different than the named reference entities in the purchased CDS); the contractual terms of the CDS (which may have a defined credit event that does not align with an actual loss realized by the Firm); and the maturity of the Firm's CDS protection (which in some cases may be shorter than the Firm's exposures). However, the Firm generally seeks to purchase credit protection with a maturity date that is the same or similar to the maturity date of the exposure for which the protection was purchased, and remaining differences in maturity are actively monitored and managed by the Firm. Refer to Credit derivatives in Note 5 for further information on credit derivatives and derivatives used in credit portfolio management activities.

ALLOWANCE FOR CREDIT LOSSES

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The Firm's allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is recognized within Investment Securities on the Consolidated balance sheets.

Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2021 was $18.7 billion, a decrease from $30.8 billion at December 31, 2020. The decrease in the allowance for credit losses was primarily driven by improvements in the macroeconomic environment, consisting of:

- a $9.5 billion reduction in consumer, predominantly in the credit card portfolio; and
- a $2.6 billion net reduction in wholesale, across the LOBs.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of $18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

The Firm's central case assumptions reflected U.S. unemployment rates and year over year growth in U.S. real GDP as follows:

	Assumptions at December 31, 2021		
	2Q22	**4Q22**	**2Q23**
U.S. unemployment rate[(a)]	**4.2 %**	**4.0 %**	**3.9 %**
YoY growth in U.S. real GDP[(b)]	**3.1 %**	**2.8 %**	**2.1 %**

	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate[(a)]	6.8 %	5.7 %	5.1 %
YoY growth in U.S. real GDP[(b)]	9.2 %	3.5 %	3.9 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) As of December 31, 2021, the year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percent change in U.S. real GDP levels from the prior year. This year over year growth rate replaces the previously disclosed pandemic-focused measure of the cumulative change in U.S. real GDP from pre-pandemic conditions at December 31, 2019. Prior periods have been revised to conform with the current presentation.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 for further information on the allowance for credit losses and related management judgments. Refer to Consumer Credit Portfolio on pages 110-116 , Wholesale Credit Portfolio on pages 117-128 for additional information on the consumer and wholesale credit portfolios.

Allowance for credit losses and related information

Year ended December 31, (in millions, except ratios)	2021 Consumer, excluding credit card	2021 Credit card	2021 Wholesale	2021 Total	2020 Consumer, excluding credit card	2020 Credit card	2020 Wholesale	2020 Total
Allowance for loan losses								
Beginning balance at January 1,	**$ 3,636**	**$ 17,800**	**$ 6,892**	**$ 28,328**	$ 2,538	$ 5,683	$ 4,902	$ 13,123
Cumulative effect of a change in accounting principle[a]	**NA**	**NA**	**NA**	**NA**	297	5,517	(1,642)	4,172
Gross charge-offs	**630**	**3,651**	**283**	**4,564**	805	5,077	954	6,836
Gross recoveries collected	**(619)**	**(939)**	**(141)**	**(1,699)**	(631)	(791)	(155)	(1,577)
Net charge-offs	**11**	**2,712**	**142**	**2,865**	174	4,286	799	5,259
Provision for loan losses	**(1,858)**	**(4,838)**	**(2,375)**	**(9,071)**	974	10,886	4,431	16,291
Other	**(2)**	**–**	**(4)**	**(6)**	1	–	–	1
Ending balance at December 31,	**$ 1,765**	**$ 10,250**	**$ 4,371**	**$ 16,386**	$ 3,636	$ 17,800	$ 6,892	$ 28,328
Allowance for lending-related commitments								
Beginning balance at January 1,	**$ 187**	**$ –**	**$ 2,222**	**$ 2,409**	$ 12	$ –	$ 1,179	$ 1,191
Cumulative effect of a change in accounting principle[a]	**NA**	**NA**	**NA**	**NA**	133	–	(35)	98
Provision for lending-related commitments	**(75)**	**–**	**(74)**	**(149)**	42	–	1,079	1,121
Other	**1**	**–**	**–**	**1**	–	–	(1)	(1)
Ending balance at December 31,	**$ 113**	**$ –**	**$ 2,148**	**$ 2,261**	$ 187	$ –	$ 2,222	$ 2,409
Impairment methodology								
Asset-specific[b]	**$ (665)**	**$ 313**	**$ 263**	**$ (89)**	$ (7)	$ 633	$ 682	$ 1,308
Portfolio-based	**2,430**	**9,937**	**4,108**	**16,475**	3,643	17,167	6,210	27,020
Total allowance for loan losses	**$ 1,765**	**$ 10,250**	**$ 4,371**	**$ 16,386**	$ 3,636	$ 17,800	$ 6,892	$ 28,328
Impairment methodology								
Asset-specific	**$ –**	**$ –**	**$ 167**	**$ 167**	$ –	$ –	$ 114	$ 114
Portfolio-based	**113**	**–**	**1,981**	**2,094**	187	–	2,108	2,295
Total allowance for lending-related commitments	**$ 113**	**$ –**	**$ 2,148**	**$ 2,261**	$ 187	$ –	$ 2,222	$ 2,409
Total allowance for investment securities	**NA**	**NA**	**NA**	**$ 42**	NA	NA	NA	$ 78
Total allowance for credit losses	**$ 1,878**	**$ 10,250**	**$ 6,519**	**$ 18,689**	$ 3,823	$ 17,800	$ 9,114	$ 30,815
Memo:								
Retained loans, end of period	**$ 295,556**	**$ 154,296**	**$ 560,354**	**$ 1,010,206**	$ 302,127	$ 143,432	$ 514,947	$ 960,506
Retained loans, average	**298,814**	**139,900**	**526,557**	**965,271**	302,005	146,391	509,907	958,303
Credit ratios								
Allowance for loan losses to retained loans	**0.60 %**	**6.64 %**	**0.78 %**	**1.62 %**	1.20 %	12.41 %	1.34 %	2.95 %
Allowance for loan losses to retained nonaccrual loans[c]	**36**	**NM**	**213**	**236**	67	NM	208	323
Allowance for loan losses to retained nonaccrual loans excluding credit card	**36**	**NM**	**213**	**89**	67	NM	208	120
Net charge-off rates	**–**	**1.94**	**0.03**	**0.30**	0.06	2.93	0.16	0.55

(a) Represents the impact to allowance for credit losses upon the adoption of CECL on January 1, 2020. Refer to Note 1 for further information.
(b) Includes collateral dependent loans, including those considered TDRs and those for which foreclosure is deemed probable, modified PCD loans, and non-collateral dependent loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loan losses modified or reasonably expected to be modified in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.
(c) The Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.

Allocation of allowance for loan losses

The table below presents a breakdown of the allowance for loan losses by loan class. Refer to Note 12 for further information on loan classes.

December 31, (in millions, except ratios)	2021 Allowance for loan losses	2021 Percent of retained loans to total retained loans	2020 Allowance for loan losses	2020 Percent of retained loans to total retained loans
Residential real estate	$ 817	22 %	$ 2,047	23 %
Auto and other	948	7	1,589	8
Consumer, excluding credit card	1,765	29	3,636	31
Credit card	10,250	15	17,800	15
Total consumer	12,015	45	21,436	46
Secured by real estate	1,495	12	2,115	12
Commercial and industrial	1,881	14	3,643	15
Other	995	29	1,134	26
Total wholesale	4,371	55	6,892	54
Total	$ 16,386	100 %	$ 28,328	100 %

INVESTMENT PORTFOLIO RISK MANAGEMENT

Investment portfolio risk is the risk associated with the loss of principal or a reduction in expected returns on investments arising from the investment securities portfolio or from principal investments. The investment securities portfolio is predominantly held by Treasury and CIO in connection with the Firm's balance sheet and asset-liability management objectives. Principal investments are predominantly privately-held financial instruments and are managed in the LOBs and Corporate. Investments are typically intended to be held over extended periods and, accordingly, the Firm has no expectation for short-term realized gains with respect to these investments.

Investment securities risk

Investment securities risk includes the exposure associated with a default in the payment of principal and interest. This risk is mitigated given that the investment securities portfolio held by Treasury and CIO predominantly consists of high-quality securities. At December 31, 2021, the Treasury and CIO investment securities portfolio, net of allowance for credit losses, was $670.1 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Refer to Corporate segment results on pages 79-80 and Note 10 for further information on the investment securities portfolio and internal risk ratings. Refer to Market Risk Management on pages 133-140 for further information on the market risk inherent in the portfolio. Refer to Liquidity Risk Management on pages 97-104 for further information on related liquidity risk.

Governance and oversight

Investment securities risks are governed by the Firm's Risk Appetite framework, and reviewed at the CTC Risk Committee with regular updates to the Board Risk Committee.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investment securities in accordance with relevant policies. Approved levels for investment securities are established for each risk category, including capital and credit risks.

Principal investment risk

Principal investments are typically privately-held financial instruments representing ownership interests or other forms of junior capital. In general, principal investments include tax-oriented investments and investments made to enhance or accelerate the Firm's business strategies and exclude those that are consolidated on the Firm's balance sheets. These investments are made by dedicated investing businesses or as part of a broader business strategy. The Firm's principal investments are managed by the LOBs and Corporate and are reflected within their respective financial results. The Firm's investments will continue to evolve in line with its strategies, including the Firm's commitment to support underserved communities and minority-owned businesses. The aggregate carrying values of the principal investment portfolios have not been significantly affected by the impact of the COVID-19 pandemic.

The table below presents the aggregate carrying values of the principal investment portfolios as of December 31, 2021 and 2020.

(in billions)		**December 31, 2021**		December 31, 2020
Tax-oriented investments, primarily in alternative energy and affordable housing[a]	**$**	**23.2**	$	20.0
Private equity, various debt and equity instruments, and real assets		**7.3**		6.2
Total carrying value	**$**	**30.5**	$	26.2

(a) Prior-period amount has been revised to conform with the current presentation. Refer to Note 25 for further information.

Governance and oversight

The Firm's approach to managing principal risk is consistent with the Firm's risk governance structure. A Firmwide risk policy framework exists for all principal investing activities and includes approval by executives who are independent from the investing businesses, as appropriate.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investments in accordance with relevant policies. As part of the risk governance structure, approved levels for investments are established and monitored for each relevant business or segment in order to manage the overall size of the portfolios. The Firm also conducts stress testing on these portfolios using specific scenarios that estimate losses based on significant market moves and/or other risk events.

Market risk is the risk associated with the effect of changes in market factors such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

Market Risk Management

Market Risk Management monitors market risks throughout the Firm and defines market risk policies and procedures.

Market Risk Management seeks to manage risk, facilitate efficient risk/return decisions, reduce volatility in operating performance and provide transparency into the Firm's market risk profile for senior management, the Board of Directors and regulators. Market Risk Management is responsible for the following functions:

- Maintaining a market risk policy framework
- Independently measuring, monitoring and controlling LOB, Corporate, and Firmwide market risk
- Defining, approving and monitoring of limits
- Performing stress testing and qualitative risk assessments

Risk measurement

Measures used to capture market risk

There is no single measure to capture market risk and therefore Market Risk Management uses various metrics, both statistical and nonstatistical, to assess risk including:

- Value-at-risk (VaR)
- Stress testing
- Profit and loss drawdowns
- Earnings-at-risk
- Other sensitivity-based measures

Risk monitoring and control

Market risk exposure is managed primarily through a series of limits set in the context of the market environment and business strategy. In setting limits, Market Risk Management takes into consideration factors such as market volatility, product liquidity, accommodation of client business, and management judgment. Market Risk Management maintains different levels of limits. Firm level limits include VaR and stress limits. Similarly, LOB and Corporate limits include VaR and stress limits and may be supplemented by certain nonstatistical risk measures such as profit and loss drawdowns. Limits may also be set within the LOBs and Corporate, as well as at the legal entity level.

Market Risk Management sets limits and regularly reviews and updates them as appropriate. Senior management is responsible for reviewing and approving certain of these risk limits on an ongoing basis. Limits that have not been reviewed within specified time periods by Market Risk Management are reported to senior management. The LOBs and Corporate are responsible for adhering to established limits against which exposures are monitored and reported.

Limit breaches are required to be reported in a timely manner to limit approvers, which include Market Risk Management and senior management. In the event of a breach, Market Risk Management consults with senior members of appropriate groups within the Firm to determine the suitable course of action required to return the applicable positions to compliance, which may include a reduction in risk in order to remedy the breach or granting a temporary increase in limits to accommodate an expected increase in client activity and/or market volatility. Certain Firm, Corporate or LOB-level limit breaches are escalated as appropriate.

Market Risk Management continues to actively monitor the impact of the COVID-19 pandemic on market risk exposures by leveraging existing risk measures and controls.

Models used to measure market risk are inherently imprecise and are limited in their ability to measure certain risks or to predict losses. This imprecision may be heightened when sudden or severe shifts in market conditions occur. For additional discussion on model uncertainty refer to Estimations and Model Risk Management on page 149.

Market Risk Management periodically reviews the Firm's existing market risk measures to identify opportunities for enhancement, and to the extent appropriate, will calibrate those measures accordingly over time.

The following table summarizes the predominant business activities and related market risks, as well as positions which give rise to market risk and certain measures used to capture those risks, for each LOB and Corporate.

In addition to the predominant business activities, each LOB and Corporate may engage in principal investing activities. To the extent principal investments are deemed market risk sensitive, they are reflected in relevant risk measures and captured in the table below. Refer to Investment Portfolio Risk Management on page 132 for additional discussion on principal investments.

LOBs and Corporate	Predominant business activities	Related market risks	Positions included in Risk Management VaR	Positions included in earnings-at-risk	Positions included in other sensitivity-based measures
CCB	• Originates and services mortgage loans • Originates loans and takes deposits	• Risk from changes in the probability of newly originated mortgage commitments closing • Interest rate risk and prepayment risk	• Mortgage commitments, classified as derivatives • Warehouse loans that are fair value option elected, classified as loans – debt instruments • MSRs • Hedges of mortgage commitments, warehouse loans and MSRs, classified as derivatives • Interest-only and mortgage-backed securities, classified as trading assets debt instruments, and related hedges, classified as derivatives • Fair value option elected liabilities[(a)]	• Retained loan portfolio • Deposits	• Fair value option elected liabilities DVA[(a)]
CIB	• Makes markets and services clients across fixed income, foreign exchange, equities and commodities • Originates loans and takes deposits	• Risk of loss from adverse movements in market prices and implied volatilities across interest rate, foreign exchange, credit, commodity and equity instruments • Basis and correlation risk from changes in the way asset values move relative to one another • Interest rate risk and prepayment risk	• Trading assets/liabilities – debt and marketable equity instruments, and derivatives, including hedges of the retained loan portfolio • Certain securities purchased, loaned or sold under resale agreements and securities borrowed • Fair value option elected liabilities[(a)] • Certain fair value option elected loans • Derivative CVA and associated hedges • Marketable equity investments	• Retained loan portfolio • Deposits	• Privately held equity and other investments measured at fair value; and certain real estate-related fair value option elected loans • Derivatives FVA and fair value option elected liabilities DVA[(a)]
CB	• Originates loans and takes deposits	• Interest rate risk and prepayment risk	• Marketable equity investments[(b)]	• Retained loan portfolio • Deposits	
AWM	• Provides initial capital investments in products such as mutual funds and capital invested alongside third-party investors • Originates loans and takes deposits	• Risk from adverse movements in market factors (e.g., market prices, rates and credit spreads) • Interest rate risk and prepayment risk	• Debt securities held in advance of distribution to clients, classified as trading assets - debt instruments[(b)]	• Retained loan portfolio • Deposits	• Initial seed capital investments and related hedges, classified as derivatives • Certain deferred compensation and related hedges, classified as derivatives • Capital invested alongside third-party investors, typically in privately distributed collective vehicles managed by AWM (i.e., co-investments)
Corporate	• Manages the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks	• Structural interest rate risk from the Firm's traditional banking activities • Structural non-USD foreign exchange risks	• Derivative positions measured through noninterest revenue in earnings • Marketable equity investments	• Deposits with banks • Investment securities portfolio and related interest rate hedges • Long-term debt and related interest rate hedges	• Privately held equity and other investments measured at fair value • Foreign exchange exposure related to Firm-issued non-USD long-term debt ("LTD") and related hedges

(a) Reflects structured notes in Risk Management VaR and the DVA on structured notes in other sensitivity-based measures.
(b) The AWM and CB contributions to Firmwide average VaR were not material for the years ended December 31, 2021 and 2020.

Value-at-risk

JPMorgan Chase utilizes value-at-risk ("VaR"), a statistical risk measure, to estimate the potential loss from adverse market moves in the current market environment. The Firm has a single VaR framework used as a basis for calculating Risk Management VaR and Regulatory VaR.

The framework is employed across the Firm using historical simulation based on data for the previous 12 months. The framework's approach assumes that historical changes in market values are representative of the distribution of potential outcomes in the immediate future. The Firm believes the use of Risk Management VaR provides a daily measure of risk that is closely aligned to risk management decisions made by the LOBs and Corporate and, along with other market risk measures, provides the appropriate information needed to respond to risk events.

The Firm's Risk Management VaR is calculated assuming a one-day holding period and an expected tail-loss methodology which approximates a 95% confidence level. Risk Management VaR provides a consistent framework to measure risk profiles and levels of diversification across product types and is used for aggregating risks and monitoring limits across businesses. VaR results are reported to senior management, the Board of Directors and regulators.

Underlying the overall VaR model framework are individual VaR models that simulate historical market returns for individual risk factors and/or product types. To capture material market risks as part of the Firm's risk management framework, comprehensive VaR model calculations are performed daily for businesses whose activities give rise to market risk. These VaR models are granular and incorporate numerous risk factors and inputs to simulate daily changes in market values over the historical period; inputs are selected based on the risk profile of each portfolio, as sensitivities and historical time series used to generate daily market values may be different across product types or risk management systems. The VaR model results across all portfolios are aggregated at the Firm level.

As VaR is based on historical data, it is an imperfect measure of market risk exposure and potential future losses. In addition, based on their reliance on available historical data, limited time horizons, and other factors, VaR measures are inherently limited in their ability to measure certain risks and to predict losses, particularly those associated with market illiquidity and sudden or severe shifts in market conditions.

For certain products, specific risk parameters are not captured in VaR due to the lack of liquidity and availability of appropriate historical data. The Firm uses proxies to estimate the VaR for these and other products when daily time series are not available. It is likely that using an actual price-based time series for these products, if available, would affect the VaR results presented. The Firm therefore considers other nonstatistical measures such as stress testing, in addition to VaR, to capture and manage its market risk positions.

The daily market data used in VaR models may be different than the independent third-party data collected for VCG price testing in its monthly valuation process. For example, in cases where market prices are not observable, or where proxies are used in VaR historical time series, the data sources may differ. Refer to Valuation process in Note 2 for further information on the Firm's valuation process. As VaR model calculations require daily data and a consistent source for valuation, it may not be practical to use the data collected in the VCG monthly valuation process for VaR model calculations.

The Firm's VaR model calculations are periodically evaluated and enhanced in response to changes in the composition of the Firm's portfolios, changes in market conditions, improvements in the Firm's modeling techniques and measurements, and other factors. Such changes may affect historical comparisons of VaR results. Refer to Estimations and Model Risk Management on page 149 for information regarding model reviews and approvals.

The Firm calculates separately a daily aggregated VaR in accordance with regulatory rules ("Regulatory VaR"), which is used to derive the Firm's regulatory VaR-based capital requirements under Basel III capital rules. This Regulatory VaR model framework currently assumes a ten business-day holding period and an expected tail loss methodology which approximates a 99% confidence level. Regulatory VaR is applied to "covered" positions as defined by Basel III capital rules, which may be different than the positions included in the Firm's Risk Management VaR. For example, credit derivative hedges of accrual loans are included in the Firm's Risk Management VaR, while Regulatory VaR excludes these credit derivative hedges. In addition, in contrast to the Firm's Risk Management VaR, Regulatory VaR currently excludes the diversification benefit for certain VaR models.

Refer to JPMorgan Chase's Basel III Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for additional information on Regulatory VaR and the other components of market risk regulatory capital for the Firm (e.g., VaR-based measure, stressed VaR-based measure and the respective backtesting).

The table below shows the results of the Firm's Risk Management VaR measure using a 95% confidence level. VaR can vary significantly as positions change, market volatility fluctuates, and diversification benefits change.

Total VaR

As of or for the year ended December 31,	2021			2020		
(in millions)	Avg.	Min	Max	Avg.	Min	Max
CIB trading VaR by risk type						
Fixed income	**$ 60**	**$ 30**	**$ 153**	$ 98	$ 35	$ 156
Foreign exchange	**6**	**2**	**27**	10	4	18
Equities	**16**	**8**	**38**	24	13	41
Commodities and other	**19**	**9**	**43**	28	7	47
Diversification benefit to CIB trading VaR	**(49)** [a]	**NM** [c]	**NM** [c]	(67) [a]	NM [c]	NM [c]
CIB trading VaR	**52**	**22**	**134**	93	32	160
Credit portfolio VaR	**6**	**4**	**12**	16	3	28
Diversification benefit to CIB VaR	**(6)** [a]	**NM** [c]	**NM** [c]	(17) [a]	NM [c]	NM [c]
CIB VaR	**52**	**22**	**133**	92	31	162
CCB VaR	**5**	**3**	**11**	5	1	12
Corporate and other LOB VaR	**24** [b]	**14**	**94** [b]	19 [b]	9	82 [b]
Diversification benefit to other VaR	**(4)** [a]	**NM** [c]	**NM** [c]	(4) [a]	NM [c]	NM [c]
Other VaR	**25**	**14**	**94**	20	10	82
Diversification benefit to CIB and other VaR	**(22)** [a]	**NM** [c]	**NM** [c]	(17) [a]	NM [c]	NM [c]
Total VaR	**$ 55**	**$ 24**	**$ 153**	$ 95	$ 32	$ 164

(a) Diversification benefit represents the difference between the portfolio VaR and the sum of its individual components. This reflects the non-additive nature of VaR due to imperfect correlation across LOBs, Corporate, and risk types.
(b) Average and maximum Corporate and other LOB VaR were primarily driven by a private equity position that became publicly traded at the end of the third quarter of 2020. As of March 31, 2021 the Firm no longer held this position.
(c) The maximum and minimum VaR for each portfolio may have occurred on different trading days than the components and consequently diversification benefit is not meaningful.

Generally, average VaR across risk types and LOBs was lower due to volatility which occurred at the onset of the COVID-19 pandemic rolling out of the one-year historical look-back period, predominantly impacting exposures in fixed income and commodities. As a result, average Total VaR decreased by $40 million for the year ended December 31, 2021 when compared with the prior year.

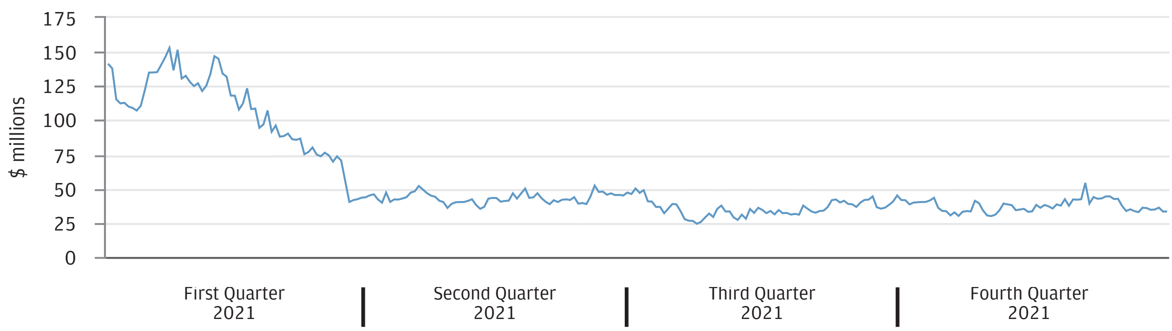
In the current year, maximum VaR remained elevated relative to average VaR as the aforementioned volatility was still included in the historical look-back period in the first quarter of 2021.

Effective July 1, 2020, the Firm refined the scope of VaR to exclude certain real estate-related fair value option elected loans, and included them in other sensitivity-based measures to more effectively measure the risk from these loans. In the absence of this refinement, the average Total VaR and each of the components would have been higher by the amounts reported in the following table:

For the year ended December 31,	Amount by which reported average VaR would have been higher	
(in millions)	**2021**	**2020**
CIB fixed income VaR	$ 5	$ 11
CIB trading VaR	5	9
CIB VaR	5	9
Total VaR	4	9

The following graph presents daily Risk Management VaR for the four trailing quarters. As noted previously, average Total VaR decreased by $40 million for the year ended December 31, 2021, when compared with the prior year. Daily Risk Management VaR has also declined, returning to pre-pandemic levels, as the volatility which occurred in late March of 2020 at the onset of the COVID-19 pandemic has rolled out of the one-year historical look-back period.

Daily Risk Management VaR



VaR backtesting

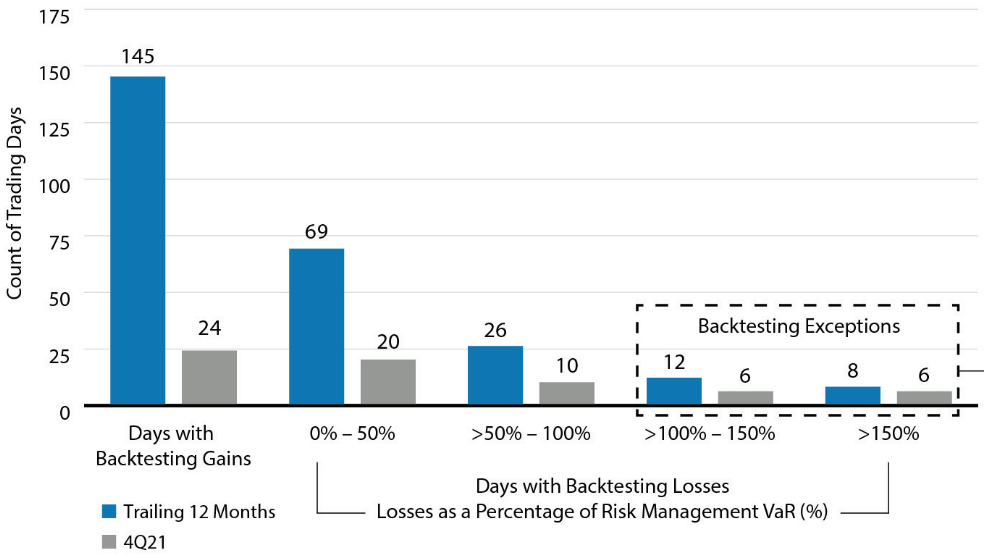
The Firm performs daily VaR model backtesting, which compares the daily Risk Management VaR results with the daily gains and losses that are utilized for VaR backtesting purposes. The gains and losses depicted in the chart below do not reflect the Firm’s reported revenue as they exclude select components of total net revenue, such as those associated with the execution of new transactions (i.e., intraday client-driven trading and intraday risk management activities), fees, commissions, certain valuation adjustments and net interest income. These excluded components of total net revenue may more than offset the backtesting gain or loss on a particular day. The definition of backtesting gains and losses above is consistent with the requirements for backtesting under Basel III capital rules.

A backtesting exception occurs when the daily backtesting loss exceeds the daily Risk Management VaR for the prior day. Under the Firm’s Risk Management VaR methodology, assuming current changes in market values are consistent with the historical changes used in the simulation, the Firm would expect to incur VaR backtesting exceptions on average five times every 100 trading days. The number of VaR backtesting exceptions observed can differ from the statistically expected number of backtesting exceptions if the current level of market volatility is materially different from the level of market volatility during the 12 months of historical data used in the VaR calculation.

For the 12 months ended December 31, 2021, the Firm posted backtesting gains on 145 of the 260 days, and observed 20 VaR backtesting exceptions. Twelve of the backtesting exceptions were in the three months ended December 31, 2021 as market volatility, particularly related to interest rates, was materially higher than the market volatility in the 12 months of historical data used for the VaR calculation. Firmwide backtesting loss days can differ from the loss days for which Fixed Income Markets and Equity Markets posted losses, as disclosed in CIB Markets revenue, as the population of positions which compose each metric are different and due to the exclusion of select components of total net revenue in backtesting gains and losses as described above. For more information on CIB Markets revenue, refer to pages 70-71.

The following chart presents the distribution of Firmwide daily backtesting gains and losses for the trailing 12 months and three months ended December 31, 2021. The daily backtesting losses are displayed as a percentage of the corresponding daily Risk Management VaR. The count of days with backtesting losses are shown in aggregate, in fifty percentage point intervals. Backtesting exceptions are displayed within the intervals that are greater than one hundred percent. The results in the chart below differ from the results of backtesting disclosed in the Market Risk section of the Firm’s Basel III Pillar 3 Regulatory Capital Disclosures reports, which are based on Regulatory VaR applied to the Firm’s covered positions.

Distribution of Daily Backtesting Gains and Losses



Backtesting Exceptions for Trailing 12 Months	
1Q21	0
2Q21	4
3Q21	4
4Q21	12

Other risk measures

Stress testing

Along with VaR, stress testing is an important tool used to assess risk. While VaR reflects the risk of loss due to adverse changes in markets using recent historical market behavior, stress testing reflects the risk of loss from hypothetical changes in the value of market risk sensitive positions applied simultaneously. Stress testing measures the Firm's vulnerability to losses under a range of stressed but possible economic and market scenarios. The results are used to understand the exposures responsible for those potential losses and are measured against limits.

The Firm's stress framework covers market risk sensitive positions in the LOBs and Corporate. The framework is used to calculate multiple magnitudes of potential stress for both market rallies and market sell-offs, assuming significant changes in market factors such as credit spreads, equity prices, interest rates, currency rates and commodity prices, and combines them in multiple ways to capture an array of hypothetical economic and market scenarios.

The Firm generates a number of scenarios that focus on tail events in specific asset classes and geographies, including how the event may impact multiple market factors simultaneously. Scenarios also incorporate specific idiosyncratic risks and stress basis risk between different products. The flexibility in the stress framework allows the Firm to construct new scenarios that can test the outcomes against possible future stress events. Stress testing results are reported periodically to senior management of the Firm, as appropriate.

Stress scenarios are governed by the overall stress framework, under the oversight of Market Risk Management, and the models to calculate the stress results are subject to the Firm's Estimations and Model Risk Management Policy. The Firmwide Market Risk Stress Methodology Committee reviews and approves changes to stress testing methodology and scenarios across the Firm. Significant changes to the framework are escalated to senior management, as appropriate.

The Firm's stress testing framework is utilized in calculating the Firm's CCAR and other stress test results, which are reported periodically to the Board of Directors. In addition, stress testing results are incorporated into the Firm's Risk Appetite framework, and are reported periodically to the Board Risk Committee.

Profit and loss drawdowns

Profit and loss drawdowns are used to highlight trading losses above certain levels of risk tolerance. A profit and loss drawdown is a decline in revenue from its year-to-date peak level.

Earnings-at-risk

The effect of interest rate exposure on the Firm's reported net income is important as interest rate risk represents one of the Firm's significant market risks. Interest rate risk arises not only from trading activities but also from the Firm's traditional banking activities, which include extension of loans and credit facilities, taking deposits, issuing debt and the investment securities portfolio. Refer to the table on page 134 for a summary by LOB and Corporate, identifying positions included in earnings-at-risk.

The CTC Risk Committee establishes the Firm's structural interest rate risk policy and related limits, which are subject to approval by the Board Risk Committee. Treasury and CIO, working in partnership with the LOBs, calculates the Firm's structural interest rate risk profile and reviews it with senior management, including the CTC Risk Committee. In addition, oversight of structural interest rate risk is managed through a dedicated risk function reporting to the CTC CRO. This risk function is responsible for providing independent oversight and governance around assumptions and establishing and monitoring limits for structural interest rate risk. The Firm manages structural interest rate risk generally through its investment securities portfolio and interest rate derivatives.

Structural interest rate risk can occur due to a variety of factors, including:

- Differences in timing among the maturity or repricing of assets, liabilities and off-balance sheet instruments
- Differences in the amounts of assets, liabilities and off-balance sheet instruments that are maturing or repricing at the same time
- Differences in the amounts by which short-term and long-term market interest rates change (for example, changes in the slope of the yield curve)
- The impact of changes in the maturity of various assets, liabilities or off-balance sheet instruments as interest rates change

The Firm manages interest rate exposure related to its assets and liabilities on a consolidated, Firmwide basis. Business units transfer their interest rate risk to Treasury and CIO through funds transfer pricing, which takes into account the elements of interest rate exposure that can be risk-managed in financial markets. These elements include asset and liability balances and contractual rates of interest, contractual principal payment schedules, expected prepayment experience, interest rate reset dates and maturities, rate indices used for repricing, and any interest rate ceilings or floors for adjustable rate products.

One way the Firm evaluates its structural interest rate risk is through earnings-at-risk. Earnings-at-risk estimates the Firm's interest rate exposure for a given interest rate scenario. It is presented as a sensitivity to a baseline, which includes net interest income and certain interest rate sensitive fees. The baseline uses market interest rates and in the case of deposits, pricing assumptions. The Firm conducts simulations of changes to this baseline for interest rate-sensitive assets and liabilities denominated in U.S. dollars and other currencies ("non-U.S. dollar" currencies). These simulations primarily include retained loans, deposits, deposits with banks, investment securities, long-term debt and any related interest rate hedges, and funds transfer pricing of other positions in risk management VaR and other sensitivity-based measures as described on page 134.

Earnings-at-risk scenarios estimate the potential change to a net interest income baseline, over the following 12 months utilizing multiple assumptions. These scenarios include a parallel shift involving changes to both short-term and long-term rates by an equal amount; a steeper yield curve involving holding short-term rates constant and increasing long-term rates; and a flatter yield curve involving increasing short-term rates and holding long-term rates constant. These scenarios consider many different factors, including:

- The impact on exposures as a result of instantaneous changes in interest rates from baseline rates.
- Forecasted balance sheet, as well as modeled prepayment and reinvestment behavior, but exclude assumptions about actions that could be taken by the Firm or its clients and customers in response to any such instantaneous rate changes. Mortgage prepayment assumptions are based on the interest rates used in the scenarios compared with underlying contractual rates, the time since origination, and other factors which are updated periodically based on historical experience. Deposit forecasts used in the baseline and scenarios do not include assumptions to account for the reversal of Quantitative Easing.
- The pricing sensitivity of deposits, known as deposit betas, represent the amount by which deposit rates paid could change upon a given change in market interest rates. The deposit rates paid in these scenarios differ from actual deposit rates paid, due to repricing lags and other factors.

The Firm's earnings-at-risk scenarios are periodically evaluated and enhanced in response to changes in the composition of the Firm's balance sheet, changes in market conditions, improvements in the Firm's simulation and other factors. While a relevant measure of the Firm's interest rate exposure, the earnings-at-risk analysis does not represent a forecast of the Firm's net interest income (Refer to Outlook on page 49 for additional information).

The Firm's U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	2021	2020
Parallel shift:		
+100 bps shift in rates	**$ 5.0**	$ 6.9
Steeper yield curve:		
+100 bps shift in long-term rates	**1.8**	2.4
Flatter yield curve:		
+100 bps shift in short-term rates	**3.2**	4.5

The change in the Firm's U.S. dollar sensitivities as of December 31, 2021 compared to December 31, 2020 reflected updates to the Firm's baseline for higher rates as well as the impact of changes in the Firm's balance sheet.

The Firm's sensitivity to rates is primarily a result of assets repricing at a faster pace than deposits.

The Firm's non-U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	2021	2020
Parallel shift:		
+100 bps shift in rates	**$ 0.8**	$ 0.9
Flatter yield curve:		
+100 bps shift in short-term rates	**0.8**	0.8

The results of the non-U.S. dollar interest rate scenario involving a steeper yield curve with long-term rates rising by 100 basis points and short-term rates staying at current levels were not material to the Firm's earnings-at-risk at December 31, 2021 and 2020.

Non-U.S. dollar foreign exchange risk

Non-U.S. dollar FX risk is the risk that changes in foreign exchange rates affect the value of the Firm's assets or liabilities or future results. The Firm has structural non-U.S. dollar FX exposures arising from capital investments, forecasted expense and revenue, the investment securities portfolio and non-U.S. dollar-denominated debt issuance. Treasury and CIO, working in partnership with the LOBs, primarily manage these risks on behalf of the Firm. Treasury and CIO may hedge certain of these risks using derivatives.

Other sensitivity-based measures

The Firm quantifies the market risk of certain debt and equity and funding activities by assessing the potential impact on net revenue, other comprehensive income ("OCI") and noninterest expense due to changes in relevant market variables. Refer to the predominant business activities that give rise to market risk on page 134 for additional information on the positions captured in other sensitivity-based measures.

The table below represents the potential impact to net revenue, OCI or noninterest expense for market risk sensitive instruments that are not included in VaR or earnings-at-risk. Where appropriate, instruments used for hedging purposes are reported net of the positions being hedged. The sensitivities disclosed in the table below may not be representative of the actual gain or loss that would have been realized at December 31, 2021 and 2020, as the movement in market parameters across maturities may vary and are not intended to imply management's expectation of future changes in these sensitivities.

Year ended December 31, **Gain/(loss)** (in millions) Activity	Description	Sensitivity measure	2021	2020
Debt and equity[(a)]				
Asset Management activities	Consists of seed capital and related hedges; fund co-investments[(c)]; and certain deferred compensation and related hedges[(d)]	10% decline in market value	$ (69)	$ (48)
Other debt and equity	Consists of certain real estate-related fair value option elected loans, privately held equity and other investments held at fair value[(c)]	10% decline in market value	(971)	(919)
Funding activities				
Non-USD LTD cross-currency basis	Represents the basis risk on derivatives used to hedge the foreign exchange risk on the non-USD LTD[(e)]	1 basis point parallel tightening of cross currency basis	(16)	(16)
Non-USD LTD hedges foreign currency ("FX") exposure	Primarily represents the foreign exchange revaluation on the fair value of the derivative hedges[(e)]	10% depreciation of currency	15	13
Derivatives – funding spread risk[(b)]	Impact of changes in the spread related to derivatives FVA[(c)]	1 basis point parallel increase in spread	(7)	(9)
Fair value option elected liabilities – funding spread risk[(b)]	Impact of changes in the spread related to fair value option elected liabilities DVA[(e)]	1 basis point parallel increase in spread	41	40
Fair value option elected liabilities – interest rate sensitivity	Interest rate sensitivity on fair value option elected liabilities resulting from a change in the Firm's own credit spread[(e)]	1 basis point parallel increase in spread	(3)	(3)
	Interest rate sensitivity related to risk management of changes in the Firm's own credit spread on the fair value option elected liabilities noted above[(c)]	1 basis point parallel increase in spread	3	3

(a) Excludes equity securities without readily determinable fair values that are measured under the measurement alternative. Refer to Note 2 for additional information.
(b) Effective September 30, 2021, the Firm's funding spread risk measure for both derivatives and fair value option elected liabilities represents the sensitivity to the Firm's FVA spread. Previously, these measures represented the sensitivity to the Firm's credit spread observed in the market. The Firm believes the updated measure is more reflective of the Firm's funding spread risk. Prior-period amounts have been revised to conform with the current presentation.
(c) Impact recognized through net revenue.
(d) Impact recognized through noninterest expense.
(e) Impact recognized through OCI.

The Firm, through its LOBs and Corporate, may be exposed to country risk resulting from financial, economic, political or other significant developments which adversely affect the value of the Firm's exposures related to a particular country or set of countries. The Country Risk Management group actively monitors the various portfolios which may be impacted by these developments and measures the extent to which the Firm's exposures are diversified given the Firm's strategy and risk tolerance relative to a country.

Organization and management

Country Risk Management is an independent risk management function that assesses, manages and monitors exposure to country risk across the Firm.

The Firm's country risk management function includes the following activities:

- Maintaining policies, procedures and standards consistent with a comprehensive country risk framework
- Assigning sovereign ratings, assessing country risks and establishing risk tolerance relative to a country
- Measuring and monitoring country risk exposure and stress across the Firm
- Managing and approving country limits and reporting trends and limit breaches to senior management
- Developing surveillance tools, such as signaling models and ratings indicators, for early identification of potential country risk concerns
- Providing country risk scenario analysis

Sources and measurement

The Firm is exposed to country risk through its lending and deposits, investing, and market-making activities, whether cross-border or locally funded. Country exposure includes activity with both government and private-sector entities in a country.

Under the Firm's internal country risk management approach, attribution of exposure to an individual country is based on the country where the largest proportion of the assets of the counterparty, issuer, obligor or guarantor are located or where the largest proportion of its revenue is derived, which may be different than the domicile (i.e. legal residence) or country of incorporation.

Individual country exposures reflect an aggregation of the Firm's risk to an immediate default, with zero recovery, of the counterparties, issuers, obligors or guarantors attributed to that country. Activities which result in contingent or indirect exposure to a country are not included in the country exposure measure (for example, providing clearing services or secondary exposure to collateral on securities financing receivables).

Assumptions are sometimes required in determining the measurement and allocation of country exposure, particularly in the case of certain non-linear or index products, or where the nature of the counterparty, issuer, obligor or guarantor is not suitable for attribution to an individual country. The use of different measurement approaches or assumptions could affect the amount of reported country exposure.

Under the Firm's internal country risk measurement framework:

- Lending exposures are measured at the total committed amount (funded and unfunded), net of the allowance for credit losses and eligible cash and marketable securities collateral received
- Deposits are measured as the cash balances placed with central and commercial banks
- Securities financing exposures are measured at their receivable balance, net of eligible collateral received
- Debt and equity securities are measured at the fair value of all positions, including both long and short positions
- Counterparty exposure on derivative receivables is measured at the derivative's fair value, net of the fair value of the eligible collateral received
- Credit derivatives protection purchased and sold is reported based on the underlying reference entity and is measured at the notional amount of protection purchased or sold, net of the fair value of the recognized derivative receivable or payable. Credit derivatives protection purchased and sold in the Firm's market-making activities is measured on a net basis, as such activities often result in selling and purchasing protection related to the same underlying reference entity; this reflects the manner in which the Firm manages these exposures

The Firm's internal country risk reporting differs from the reporting provided under the FFIEC bank regulatory requirements.

Stress testing
Stress testing is an important component of the Firm's country risk management framework, which aims to estimate and limit losses arising from a country crisis by measuring the impact of adverse asset price movements to a country based on market shocks combined with counterparty specific assumptions. Country Risk Management periodically designs and runs tailored stress scenarios to test vulnerabilities to individual countries or sets of countries in response to specific or potential market events, sector performance concerns, sovereign actions and geopolitical risks. These tailored stress results are used to inform potential risk reduction across the Firm, as necessary.

COVID-19 Pandemic
Country Risk Management continues to monitor the impact of the COVID-19 pandemic on individual countries.

Risk reporting
Country exposure and stress are measured and reported regularly, and used by Country Risk Management to identify trends, and monitor high usages and breaches against limits.

For country risk management purposes, the Firm may report exposure to jurisdictions that are not fully autonomous, including Special Administrative Regions ("SAR") and dependent territories, separately from the independent sovereign states with which they are associated.

The following table presents the Firm's top 20 exposures by country (excluding the U.S.) as of December 31, 2021, and their comparative exposures as of December 31, 2020. The selection of countries represents the Firm's largest total exposures by individual country, based on the Firm's internal country risk management approach, and does not represent the Firm's view of any existing or potentially adverse credit conditions. Country exposures may fluctuate from period to period due to client activity and market flows.

The decrease in exposure to Germany and the increase in exposure to the United Kingdom were primarily due to changes in cash placements with the central banks of those countries driven by balance sheet and liquidity management activities in the fourth quarter of 2021.

The increase in exposure to Australia was due to increased cash placements with the central bank of Australia, largely driven by client activity following monetary policy decisions in the country and growth in client deposits.

Top 20 country exposures (excluding the U.S.)[a]

December 31, (in billions)	2021				2020[e]
	Lending and deposits[b]	Trading and investing[c]	Other[d]	Total exposure	Total exposure
United Kingdom	$ 81.7	$ 12.7	$ 2.0	$ 96.4	$ 68.4
Germany	65.3	(4.2)	0.6	61.7	127.2
Japan	38.8	6.4	0.3	45.5	45.6
Australia	29.2	9.9	–	39.1	15.9
Switzerland	14.7	1.4	4.8	20.9	18.7
China	10.1	7.1	1.4	18.6	21.2
Canada	14.7	2.0	0.2	16.9	14.5
India	5.8	7.1	1.8	14.7	10.5
France	11.0	2.0	1.0	14.0	18.8
Singapore	6.8	4.6	0.9	12.3	8.7
Brazil	5.3	6.7	–	12.0	10.8
Luxembourg	10.1	1.4	–	11.5	12.4
Spain	9.2	0.9	–	10.1	5.8
Saudi Arabia	6.9	2.2	–	9.1	5.8
South Korea	3.9	4.5	0.3	8.7	10.1
Italy	6.2	1.8	0.4	8.4	9.7
Netherlands	5.5	0.7	0.6	6.8	7.7
Belgium	5.0	1.8	–	6.8	4.0
Hong Kong SAR	3.6	2.0	0.3	5.9	6.2
Mexico	4.3	0.6	–	4.9	4.9

(a) Country exposures presented in the table reflect 89% and 90% of total Firmwide non-U.S. exposure, where exposure is attributed to an individual country, at December 31, 2021 and 2020, respectively.
(b) Lending and deposits includes loans and accrued interest receivable, lending-related commitments (net of eligible collateral and the allowance for credit losses), deposits with banks (including central banks), acceptances, other monetary assets, and issued letters of credit net of risk participations. Excludes intra-day and operating exposures, such as those from settlement and clearing activities.
(c) Includes market-making inventory, Investment securities, and counterparty exposure on derivative and securities financings net of eligible collateral and hedging. Includes exposure from single reference entity ("single-name"), index and other multiple reference entity transactions for which one or more of the underlying reference entities is in a country listed in the above table.
(d) Predominantly includes physical commodity inventory.
(e) The country rankings presented in the table as of December 31, 2020, are based on the country rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems. Operational Risk includes compliance, conduct, legal, and estimations and model risk. Operational risk is inherent in the Firm's activities and can manifest itself in various ways, including fraudulent acts, business disruptions (including those caused by extraordinary events beyond the Firm's control) cyber attacks, inappropriate employee behavior, failure to comply with applicable laws, rules and regulations or failure of vendors or other third party providers to perform in accordance with their agreements. Operational Risk Management attempts to manage operational risk at appropriate levels in light of the Firm's financial position, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

Operational Risk Management Framework

The Firm's Compliance, Conduct, and Operational Risk ("CCOR") Management Framework is designed to enable the Firm to govern, identify, measure, monitor and test, manage and report on the Firm's operational risk.

Operational Risk Governance

The LOBs and Corporate are responsible for the management of operational risk. The Control Management Organization, which consists of control managers within each LOB and Corporate, is responsible for the day-to-day execution of the CCOR Framework and the evaluation of the effectiveness of their control environments to determine where targeted remediation efforts may be required.

The Firm's Global Chief Compliance Officer ("CCO") and FRE for Operational Risk and Qualitative Risk Appetite is responsible for defining the CCOR Management Framework and establishing minimum standards for its execution. The LOB and Corporate aligned CCOR Lead Officers report to the Global CCO and FRE for Operational Risk and Qualitative Risk Appetite and are independent of the respective businesses or functions they oversee. The CCOR Management Framework is included in the Risk Governance and Oversight Policy that is reviewed and approved by the Board Risk Committee periodically.

Operational Risk Identification

The Firm utilizes a structured risk and control self-assessment process that is executed by the LOBs and Corporate. As part of this process, the LOBs and Corporate evaluate the effectiveness of their control environment to assess where controls have failed, and to determine where remediation efforts may be required. The Firm's Operational Risk and Compliance organization ("Operational Risk and Compliance") provides oversight of and challenge to these evaluations and may also perform independent assessments of significant operational risk events and areas of concentrated or emerging risk.

Operational Risk Measurement

Operational Risk and Compliance performs an independent assessment of the operational risks inherent within the LOBs and Corporate, which includes evaluating the effectiveness of the control environments and reporting the results to senior management.

In addition, Operational Risk and Compliance assesses operational risks through quantitative means, including operational risk-based capital and estimation of operational risk losses under both baseline and stressed conditions.

The primary component of the operational risk capital estimate is the Loss Distribution Approach ("LDA") statistical model, which simulates the frequency and severity of future operational risk loss projections based on historical data. The LDA model is used to estimate an aggregate operational risk loss over a one-year time horizon, at a 99.9% confidence level. The LDA model incorporates actual internal operational risk losses in the quarter following the period in which those losses were realized, and the calculation generally continues to reflect such losses even after the issues or business activities giving rise to the losses have been remediated or reduced.

As required under the Basel III capital framework, the Firm's operational risk-based capital methodology, which uses the Advanced Measurement Approach ("AMA"), incorporates internal and external losses as well as management's view of tail risk captured through operational risk scenario analysis, and evaluation of key business environment and internal control metrics. The Firm does not reflect the impact of insurance in its AMA estimate of operational risk capital.

The Firm considers the impact of stressed economic conditions on operational risk losses and develops a forward looking view of material operational risk events that may occur in a stressed environment. The Firm's operational risk stress testing framework is utilized in calculating results for the Firm's CCAR and other stress testing processes.

Refer to Capital Risk Management on pages 86-96 for information related to operational risk RWA, and CCAR.

Operational Risk Monitoring and testing

The results of risk assessments performed by Operational Risk and Compliance are leveraged as one of the key criteria in the independent monitoring and testing of the LOBs and Corporate's compliance with laws, rules and regulation. Through monitoring and testing, Operational Risk and Compliance independently identify areas of heightened operational risk and tests the effectiveness of controls within the LOBs and Corporate.

Management of Operational Risk
The operational risk areas or issues identified through monitoring and testing are escalated to the LOBs and Corporate to be remediated through action plans, as needed, to mitigate operational risk. Operational Risk and Compliance may advise the LOBs and Corporate in the development and implementation of action plans.

Operational Risk Reporting
Escalation of risks is a fundamental expectation for employees at the Firm. Risks identified by Operational Risk and Compliance are escalated to the appropriate LOB and Corporate Control Committees, as needed. Operational Risk and Compliance has established standards to ensure that consistent operational risk reporting and operational risk reports are produced on a Firmwide basis as well as by the LOBs and Corporate. Reporting includes the evaluation of key risk and performance indicators against established thresholds as well as the assessment of different types of operational risk against stated risk appetite. The standards reinforce escalation protocols to senior management and to the Board of Directors.

Subcategories and examples of operational risks

Operational risk can manifest itself in various ways. Operational risk subcategories such as Compliance risk, Conduct risk, Legal risk, and Estimations and Model risk as well as other operational risks, can lead to losses which are captured through the Firm's operational risk measurement processes. Refer to pages 146, 147, 148 and 149, respectively for more information on Compliance, Conduct, Legal, and Estimations and Model risk. Details on other select examples of operational risks are provided below.

Cybersecurity risk
Cybersecurity risk is the risk of the Firm's exposure to harm or loss resulting from misuse or abuse of technology by malicious actors. Cybersecurity risk is an important and continuously evolving focus for the Firm. Significant resources are devoted to protecting and enhancing the security of computer systems, software, networks, storage devices, and other technology assets. The Firm's security efforts are designed to protect against, among other things, cybersecurity attacks by unauthorized parties attempting to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage.

Ongoing business expansions may expose the Firm to potential new threats as well as expanded regulatory scrutiny including the introduction of new cybersecurity requirements. The Firm continues to make significant investments in enhancing its cyber defense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the operating environment, enhance defenses and improve resiliency against cybersecurity threats. The Firm actively participates in discussions and simulations of cybersecurity risks both internally and with law enforcement, government officials, peer and industry groups, and has significantly increased efforts to educate employees and certain clients on the topic of cybersecurity risks.

Third parties with which the Firm does business or that facilitate the Firm's business activities (e.g., vendors, supply chain, exchanges, clearing houses, central depositories, and financial intermediaries) are also sources of cybersecurity risk to the Firm. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks, including ransomware and supply-chain compromises could affect their ability to deliver a product or service to the Firm or result in lost or compromised information of the Firm or its clients. Clients are also sources of cybersecurity risk to the Firm and its information assets, particularly when their activities and systems are beyond the Firm's own security and control systems. As a result, the Firm engages in regular and ongoing discussions with certain vendors and clients regarding cybersecurity risks and opportunities to improve security. However, where cybersecurity incidents occur as a result of client failures to maintain the security of their own systems and processes, clients are responsible for losses incurred.

To protect the confidentiality, integrity and availability of the Firm's infrastructure, resources and information, the Firm maintains a cybersecurity program designed to prevent, detect, and respond to cyberattacks. The Audit Committee is periodically provided with updates on the Firm's Information Security Program, recommended changes, cybersecurity policies and practices, ongoing efforts to improve security, as well as its efforts regarding significant cybersecurity events. In addition, the Firm has a cybersecurity incident response plan ("IRP") designed to enable the Firm to respond to attempted cybersecurity incidents, coordinate such responses with law enforcement and other government agencies, and notify clients and customers, as applicable. Among other key focus areas, the IRP is designed to mitigate the risk of insider trading connected to a cybersecurity incident, and includes various escalation points.

Due to the impact of the COVID-19 pandemic, the Firm increased the use of remote access and video conferencing solutions provided by third parties to facilitate remote work. As a result the Firm deployed additional precautionary measures and controls to mitigate cybersecurity risks and those measures and controls remain in place.

The Cybersecurity and Technology Control functions are responsible for governance and oversight of the Firm's Information Security Program. In partnership with the Firm's LOBs and Corporate, the Cybersecurity and Technology Control organization identifies information security risk issues and oversees programs for the technological protection of the Firm's information resources including applications, infrastructure as well as confidential and personal information related to the Firm's employees and customers. The Cybersecurity and Technology Controls organization consists of business aligned information security managers that are supported within the organization by the following products that execute the Information Security Program for the Firm:

- Cyber Operations
- Identity & Access Management
- Governance, Risk & Controls
- Global Technology Product Security

The Global Cybersecurity and Technology Control governance structure is designed to identify, escalate, and mitigate information security risks. This structure uses key governance forums to disseminate information and monitor technology efforts. These forums are established at multiple levels throughout the Firm and include representatives from each LOB and Corporate. The forums are used to escalate information security risks or other matters as appropriate.

The IRM function provides oversight of the activities designed to identify, assess, measure, and mitigate cybersecurity risk.

The Firm's Security Awareness Program includes training that reinforces the Firm's Information Technology Risk and Security Management policies, standards and practices, as well as the expectation that employees comply with these policies. The Security Awareness Program engages personnel through training on how to identify potential cybersecurity risks and protect the Firm's resources and information. This training is mandatory for all employees globally on a periodic basis, and it is supplemented by Firmwide testing initiatives, including periodic phishing tests. The Firm provides specialized security training for certain employee roles such as application developers. Finally, the Firm's Global Privacy Program requires all employees to take periodic awareness training on data privacy. This privacy-focused training includes information about confidentiality and security, as well as responding to unauthorized access to or use of information.

Business and technology resiliency risk

Disruptions can occur due to forces beyond the Firm's control such as the spread of infectious diseases or pandemics, severe weather, power or telecommunications loss, failure of a third party to provide expected services, cyberattacks and, terrorism. The Firmwide Business Resiliency Program is designed to enable the Firm to prepare for, adapt to, withstand and recover from business disruptions including occurrence of an extraordinary event beyond its control that may impact critical business functions and supporting assets (i.e., staff, technology, facilities and third parties). The program includes governance, awareness training, planning and testing of recovery strategies, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks.

Payment fraud risk

Payment fraud risk is the risk of external and internal parties unlawfully obtaining personal monetary benefit through misdirected or otherwise improper payment. The risk of payment fraud normalized in 2021 since the heightened levels experienced during earlier stages of the COVID-19 pandemic. The Firm continues to employ various controls for managing payment fraud risk as well as providing employee and client education and awareness trainings.

Third-party outsourcing risk

The Firm's Third-Party Oversight ("TPO") and Inter-affiliates Oversight ("IAO") frameworks assist the LOBs and Corporate in selecting, documenting, onboarding, monitoring and managing their supplier relationships including services provided by affiliates. The objectives of the TPO framework are to hold suppliers and other third parties to a high level of operational performance and to mitigate key risks, including data loss and business disruptions. The Corporate Third-Party Oversight group is responsible for Firmwide training, monitoring, reporting and standards.

Insurance

One of the ways in which operational risk may be mitigated is through insurance maintained by the Firm. The Firm purchases insurance from commercial insurers and maintains a wholly-owned captive insurer, Park Assurance Company. Insurance may also be required by third parties with whom the Firm does business.

COMPLIANCE RISK MANAGEMENT

Compliance risk, a subcategory of operational risk, is the risk of failing to comply with laws, rules, regulations or codes of conduct and standards of self-regulatory organizations.

Overview

Each of the LOBs and Corporate hold primary ownership of and accountability for managing their compliance risk. The Firm's Operational Risk and Compliance Organization ("Operational Risk and Compliance"), which is independent of the LOBs and Corporate, provides independent review, monitoring and oversight of business operations with a focus on compliance with the laws, rules, and regulations applicable to the delivery of the Firm's products and services to clients and customers.

These compliance risks relate to a wide variety of laws, rules and regulations varying across the LOBs and Corporate, and jurisdictions, and include risks related to financial products and services, relationships and interactions with clients and customers, and employee activities. For example, compliance risks include those associated with anti-money laundering compliance, trading activities, market conduct, and complying with the laws, rules, and regulations related to the offering of products and services across jurisdictional borders. Compliance risk is also inherent in the Firm's fiduciary activities, including the failure to exercise the applicable standard of care (such as the duties of loyalty or care), to act in the best interest of clients and customers or to treat clients and customers fairly.

Other functions provide oversight of significant regulatory obligations that are specific to their respective areas of responsibility.

Operational Risk and Compliance implements policies and standards designed to govern, identify, measure, monitor and test, manage, and report on compliance risk.

Governance and oversight

Operational Risk and Compliance is led by the Firm's Global CCO and FRE for Operational Risk and Qualitative Risk Appetite.

The Firm maintains oversight and coordination of its compliance risk through the implementation of the CCOR Risk Management Framework. The Firm's Global CCO and FRE for Operational Risk and Qualitative Risk Appetite also provides regular updates to the Board Risk Committee and the Audit Committee. In certain cases, Special Purpose Committees of the Board may be established to oversee the Firm's compliance with regulatory Consent Orders.

Code of Conduct

The Firm has a Code of Conduct (the "Code") that sets forth the Firm's expectation that employees will conduct themselves with integrity at all times and provides the principles that govern employee conduct with clients, customers, shareholders and one another, as well as with the markets and communities in which the Firm does business. The Code requires employees to promptly report any potential or actual violation of the Code, any internal Firm policy, or any law or regulation applicable to the Firm's business. It also requires employees to report any illegal conduct, or conduct that violates the underlying principles of the Code, by any of the Firm's employees, clients, customers, suppliers, contract workers, business partners, or agents. Code training is assigned to newly hired employees upon joining the Firm, and to current employees periodically on an ongoing basis. Employees are required to affirm their compliance with the Code at least annually.

Employees can report any potential or actual violations of the Code through the Firm's Conduct Hotline by phone or the internet. The Hotline is anonymous, except in certain non-U.S. jurisdictions where laws prohibit anonymous reporting, and is available at all times globally, with translation services. It is administered by an outside service provider. The Code prohibits retaliation against anyone who raises an issue or concern in good faith. Periodically, the Audit Committee receives reports on the Code of Conduct program.

Conduct risk, a subcategory of operational risk, is the risk that any action or inaction by an employee or employees could lead to unfair client or customer outcomes, impact the integrity of the markets in which the Firm operates, or compromise the Firm's reputation.

Overview

Each LOB and Corporate is accountable for identifying and managing its conduct risk to provide appropriate engagement, ownership and sustainability of a culture consistent with the Firm's How We Do Business Principles (the "Principles"). The Principles serve as a guide for how employees are expected to conduct themselves. With the Principles serving as a guide, the Firm's Code sets out the Firm's expectations for each employee and provides information and resources to help employees conduct business ethically and in compliance with the laws everywhere the Firm operates. Refer to Compliance Risk Management on page 146 for further discussion of the Code.

Governance and oversight

The Conduct Risk Program is governed by the CCOR Management policy, which establishes the framework for governance, identification, measurement, monitoring and testing, management and reporting conduct risk in the Firm.

The Firm has a senior forum that provides oversight of the Firm's conduct initiatives to develop a more holistic view of conduct risks and to connect key programs across the Firm in order to identify opportunities and emerging areas of focus. This forum is responsible for setting overall program direction for strategic enhancements to the Firm's employee conduct framework and reviewing the consolidated Firmwide Conduct Risk Appetite Assessment.

Conduct risk management encompasses various aspects of people management practices throughout the employee life cycle, including recruiting, onboarding, training and development, performance management, promotion and compensation processes. Each LOB, Treasury and CIO, and each designated corporate function completes an assessment of conduct risk periodically, reviews metrics and issues which may involve conduct risk, and provides conduct education as appropriate.

LEGAL RISK MANAGEMENT

Legal risk, a subcategory of operational risk, is the risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm operates, agreements with clients and customers, and products and services offered by the Firm.

Overview

The global Legal function ("Legal") provides legal services and advice to the Firm. Legal is responsible for managing the Firm's exposure to legal risk by:

- managing actual and potential litigation and enforcement matters, including internal reviews and investigations related to such matters
- advising on products and services, including contract negotiation and documentation
- advising on offering and marketing documents and new business initiatives
- managing dispute resolution
- interpreting existing laws, rules and regulations, and advising on changes to them
- advising on advocacy in connection with contemplated and proposed laws, rules and regulations, and
- providing legal advice to the LOBs, Corporate and the Board.

Legal selects, engages and manages outside counsel for the Firm on all matters in which outside counsel is engaged. In addition, Legal advises the Firm's Conflicts Office which reviews the Firm's wholesale transactions that may have the potential to create conflicts of interest for the Firm.

Governance and oversight

The Firm's General Counsel reports to the CEO and is a member of the Operating Committee, the Firmwide Risk Committee and the Firmwide Control Committee. The Firm's General Counsel and other members of Legal report on significant legal matters to the Firm's Board of Directors and to the Audit Committee.

Legal serves on and advises various committees and advises the Firm's LOBs and Corporate on potential reputation risk issues.

ESTIMATIONS AND MODEL RISK MANAGEMENT

Estimations and Model risk, a subcategory of operational risk, is the potential for adverse consequences from decisions based on incorrect or misused estimation outputs.

The Firm uses models and other analytical and judgment-based estimations across various businesses and functions. The estimation methods are of varying levels of sophistication and are used for many purposes, such as the valuation of positions and measurement of risk, assessing regulatory capital requirements, conducting stress testing, evaluating the allowance for credit losses and making business decisions. A dedicated independent function, Model Risk Governance and Review ("MRGR"), defines and governs the Firm's policies relating to the management of model risk and risks associated with certain analytical and judgment-based estimations, such as those used in risk management, budget forecasting and capital planning and analysis.

The governance of analytical and judgment-based estimations within MRGR's scope follows a consistent approach which is used for models, as described in detail below.

Model risks are owned by the users of the models within the Firm based on the specific purposes of such models. Users and developers of models are responsible for developing, implementing and testing their models, as well as referring models to the MRGR for review and approval. Once models have been approved, model users and developers are responsible for maintaining a robust operating environment, and must monitor and evaluate the performance of the models on an ongoing basis. Model users and developers may seek to enhance models in response to changes in the portfolios and in product and market developments, as well as to capture improvements in available modeling techniques and systems capabilities.

Models are tiered based on an internal standard according to their complexity, the exposure associated with the model and the Firm's reliance on the model. This tiering is subject to the approval of the MRGR. In its review of a model, the MRGR considers whether the model is suitable for the specific purposes for which it will be used. When reviewing a model, the MRGR analyzes and challenges the model methodology and the reasonableness of model assumptions, and may perform or require additional testing, including back-testing of model outcomes. Model reviews are approved by the appropriate level of management within the MRGR based on the relevant model tier.

Under the Firm's Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to their use. In certain circumstances exceptions may be granted to the Firm's policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

While models are inherently imprecise, the degree of imprecision or uncertainty can be heightened by the market or economic environment. This is particularly true when the current and forecasted environment is significantly different from the historical macroeconomic environments upon which the models were trained, as the Firm experienced during the early stages of the COVID-19 pandemic. This uncertainty may necessitate a greater degree of judgment and analytics to inform adjustments to model outputs than in typical periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 and Note 2 for a summary of model-based valuations and other valuation techniques.

CRITICAL ACCOUNTING ESTIMATES USED BY THE FIRM

JPMorgan Chase's accounting policies and use of estimates are integral to understanding its reported results. The Firm's most complex accounting estimates require management's judgment to ascertain the appropriate carrying value of assets and liabilities. The Firm has established policies and control procedures intended to ensure that estimation methods, including any judgments made as part of such methods, are well-controlled, independently reviewed and applied consistently from period to period. The methods used and judgments made reflect, among other factors, the nature of the assets or liabilities and the related business and risk management strategies, which may vary across the Firm's businesses and portfolios. In addition, the policies and procedures are intended to ensure that the process for changing methodologies occurs in an appropriate manner. The Firm believes its estimates for determining the carrying value of its assets and liabilities are appropriate. The following is a brief description of the Firm's critical accounting estimates involving significant judgments.

Allowance for credit losses

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- The allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated),
- The allowance for lending-related commitments, and
- The allowance for credit losses on investment securities.

The allowance for credit losses involves significant judgment on a number of matters including development and weighting of macroeconomic forecasts, incorporation of historical loss experience, assessment of risk characteristics, assignment of risk ratings, valuation of collateral, and the determination of remaining expected life. Refer to Note 10 and Note 13 for further information on these judgments as well as the Firm's policies and methodologies used to determine the Firm's allowance for credit losses.

One of the most significant judgments involved in estimating the Firm's allowance for credit losses relates to the macroeconomic forecasts used to estimate credit losses over the eight-quarter forecast period within the Firm's methodology. The eight-quarter forecast incorporates hundreds of MEVs that are relevant for exposures across the Firm, with modeled credit losses being driven primarily by a subset of less than twenty variables. The specific variables that have the greatest effect on the modeled losses of each portfolio vary by portfolio and geography.

- Key MEVs for the consumer portfolio include U.S. unemployment, HPI and U.S. real GDP.
- Key MEVs for the wholesale portfolio include U.S. real GDP, U.S. unemployment, U.S. equity prices, corporate credit spreads, oil prices, commercial real estate prices and HPI.

Changes in the Firm's assumptions and forecasts of economic conditions could significantly affect its estimate of expected credit losses in the portfolio at the balance sheet date or lead to significant changes in the estimate from one reporting period to the next.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of $18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

It is difficult to estimate how potential changes in any one factor or input might affect the overall allowance for credit losses because management considers a wide variety of factors and inputs in estimating the allowance for credit losses. Changes in the factors and inputs considered may not occur at the same rate and may not be consistent across all geographies or product types, and changes in factors and inputs may be directionally inconsistent, such that improvement in one factor or input may offset deterioration in others.

To consider the impact of a hypothetical alternate macroeconomic forecast, the Firm compared the modeled credit losses determined using its central and relative adverse macroeconomic scenarios, which are two of the five scenarios considered in estimating the allowances for loan losses and lending-related commitments. The central and relative adverse scenarios each included a full suite of MEVs, but differed in the levels, paths and peaks/troughs of those variables over the eight-quarter forecast period.

For example, compared to the Firm's central scenario shown on page 129 and in Note 13, the Firm's relative adverse scenario assumes a significantly elevated U.S. unemployment rate, averaging approximately 2.8% higher over the eight-quarter forecast, with a peak difference of approximately 4.4% in the second quarter of 2022; lower U.S. real GDP with a slower recovery, remaining nearly

3.2% lower at the end of the eight-quarter forecast, with a peak difference of approximately 6.5% in the second quarter of 2022; and lower national HPI with a peak difference of nearly 15.8% in the second quarter of 2023.

This analysis is not intended to estimate expected future changes in the allowance for credit losses as the impacts of changes in many MEVs are both interrelated and nonlinear, so the results of this analysis cannot be simply extrapolated for more severe changes in macroeconomic variables. Additionally, expectations of future changes in portfolio composition and borrower behavior can significantly affect the allowance for credit losses.

To demonstrate the sensitivity of credit loss estimates to macroeconomic forecasts as of December 31, 2021, the Firm compared the modeled estimates under its relative adverse scenario to its central scenario. Without considering offsetting or correlated effects in other qualitative components of the Firm's allowance for credit losses, the comparison between these two scenarios for the lending exposures below reflect the following differences:

- An increase of approximately $550 million for residential real estate loans and lending-related commitments
- An increase of approximately $2.6 billion for credit card loans
- An increase of approximately $3.0 billion for wholesale loans and lending-related commitments

This analysis relates only to the modeled credit loss estimates and is not intended to estimate changes in the overall allowance for credit losses as it does not reflect any potential changes in other adjustments to the quantitative calculation, which would also be influenced by the judgment management applies to the modeled lifetime loss estimates to reflect the uncertainty and imprecision of these modeled lifetime loss estimates based on then-current circumstances and conditions.

Recognizing that forecasts of macroeconomic conditions are inherently uncertain, particularly in light of the recent economic conditions, the Firm believes that its process to consider the available information and associated risks and uncertainties is appropriately governed and that its estimates of expected credit losses were reasonable and appropriate for the period ended December 31, 2021.

Fair value

JPMorgan Chase carries a portion of its assets and liabilities at fair value. The majority of such assets and liabilities are measured at fair value on a recurring basis, including, derivatives and structured note products. Certain assets and liabilities are measured at fair value on a nonrecurring basis, including certain mortgage, home equity and other loans, where the carrying value is based on the fair value of the underlying collateral.

Assets measured at fair value

The following table includes the Firm's assets measured at fair value and the portion of such assets that are classified within level 3 of the fair value hierarchy. Refer to Note 2 for further information.

December 31, 2021 (in billions, except ratios)	Total assets at fair value	Total level 3 assets
Federal Funds sold and securities purchased under resale agreements	$ 252.7	$ –
Securities borrowed	81.5	–
Trading assets:		
Trading debt and equity instruments	376.4	2.3
Derivative receivables[(a)]	57.1	7.3
Total trading assets	433.5	9.6
AFS securities	308.5	0.2
Loans	58.8	1.9
MSRs	5.5	5.5
Other	14.0	0.3
Total assets measured at fair value on a recurring basis	1,154.5	17.5
Total assets measured at fair value on a nonrecurring basis	3.5	2.5
Total assets measured at fair value	$ 1,158.0	$ 20.0
Total Firm assets	$ 3,743.6	
Level 3 assets at fair value as a percentage of total Firm assets[(a)]		0.5%
Level 3 assets at fair value as a percentage of total Firm assets at fair value[(a)]		1.7%

(a) For purposes of the table above, the derivative receivables total reflects the impact of netting adjustments; however, the $7.3 billion of derivative receivables classified as level 3 does not reflect the netting adjustment as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

Valuation

Details of the Firm's processes for determining fair value are set out in Note 2. Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, the lack of observability of certain significant inputs requires management to assess relevant empirical data in deriving valuation inputs including, for example, transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves. Refer to Note 2 for a further discussion of the valuation of level 3 instruments, including unobservable inputs used.

For instruments classified in levels 2 and 3, management judgment must be applied to assess the appropriate level of valuation adjustments to reflect counterparty credit quality, the Firm's creditworthiness, market funding rates, liquidity considerations, unobservable parameters, and for portfolios that meet specified criteria, the size of the net open risk position. The judgments made are typically affected by the type of product and its specific contractual terms, and the level of liquidity for the product or within the market as a whole. In periods of heightened market volatility and uncertainty judgments are further affected by the wider variation of reasonable valuation estimates, particularly for positions that are less liquid. Refer to Note 2 for a further discussion of valuation adjustments applied by the Firm.

Imprecision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of methodologies or assumptions different than those used by the Firm could result in a different estimate of fair value at the reporting date. Refer to Note 2 for a detailed discussion of the Firm's valuation process and hierarchy, and its determination of fair value for individual financial instruments.

Goodwill impairment

Under U.S. GAAP, goodwill must be allocated to reporting units and tested for impairment at least annually. The Firm's process and methodology used to conduct goodwill impairment testing is described in Note 15.

Management applies significant judgment when testing goodwill for impairment. The goodwill associated with each business combination is allocated to the related reporting units for goodwill impairment testing.

For the year ended December 31, 2021, the Firm reviewed current economic conditions, including the potential impacts of the COVID-19 pandemic on business performance, estimated market cost of equity, as well as actual business results and projections of business performance for its reporting units. The Firm has concluded that the goodwill allocated to its reporting units was not impaired as of December 31, 2021. For each of the reporting units, fair value exceeded carrying value by at least 10% and there was no indication of a significant risk of goodwill impairment based on current projections and valuations.

The projections for the Firm's reporting units are consistent with management's current business outlook assumptions in the short term, and the Firm's best estimates of long-term growth and return on equity in the longer term. Where possible, the Firm uses third-party and peer data to benchmark its assumptions and estimates.

Refer to Note 15 for additional information on goodwill, including the goodwill impairment assessment as of December 31, 2021.

Credit card rewards liability

JPMorgan Chase offers credit cards with various rewards programs which allow cardholders to earn rewards points based on their account activity and the terms and conditions of the rewards program. Generally, there are no limits on the points that an eligible cardholder can earn, nor do the points expire, and the points can be redeemed for a variety of rewards, including cash (predominantly in the form of account credits), gift cards and travel. The Firm maintains a rewards liability which represents the estimated cost of rewards points earned and expected to be redeemed by cardholders. The liability is accrued as the cardholder earns the benefit and is reduced when the cardholder redeems points. This liability was $9.8 billion and $7.7 billion at December 31, 2021 and 2020, respectively, and is recorded in accounts payable and other liabilities on the Consolidated balance sheets. The increase in the liability was driven by continued growth in rewards points earned on increased spend and promotional offers outpacing redemptions throughout 2021, and to a lesser extent adjustments to redemption rate assumptions.

The rewards liability is sensitive to redemption rate ("RR") and cost per point ("CPP") assumptions. The RR assumption is used to estimate the number of points earned by customers that will be redeemed over the life of the account. The CPP assumption is used to estimate the cost of future point redemptions. These assumptions are evaluated periodically considering historical actuals, cardholder redemption behavior and management judgment. Updates to these assumptions will impact the rewards liability. As of December 31, 2021, a combined increase of 25 basis points in RR and 1 basis point in CPP would increase the rewards liability by approximately $265 million.

Income taxes

JPMorgan Chase is subject to the income tax laws of the various jurisdictions in which it operates, including U.S. federal, state and local, and non-U.S. jurisdictions. These laws are often complex and may be subject to different interpretations. To determine the financial statement impact of accounting for income taxes, including the provision for income tax expense and unrecognized tax benefits, JPMorgan Chase must make assumptions and judgments about how to interpret and apply these complex tax laws to numerous transactions and business events, as well as make judgments regarding the timing of when certain items may affect taxable income in the U.S. and non-U.S. tax jurisdictions.

JPMorgan Chase's interpretations of tax laws around the world are subject to review and examination by the various taxing authorities in the jurisdictions where the Firm operates, and disputes may occur regarding its view on a tax position. These disputes over interpretations with the various taxing authorities may be settled by audit, administrative appeals or adjudication in the court systems of the tax jurisdictions in which the Firm operates. JPMorgan Chase regularly reviews whether it may be assessed additional income taxes as a result of the resolution of these matters, and the Firm records additional unrecognized tax benefits, as appropriate. In addition, the Firm may revise its estimate of income taxes due to changes in income tax laws, legal interpretations, and business strategies. It is possible that revisions in the Firm's estimate of income taxes may materially affect the Firm's results of operations in any reporting period.

Deferred taxes arise from differences between assets and liabilities measured for financial reporting versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. Deferred taxes are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred taxes of a change in tax rates is recognized within the provision for income taxes in the period enacted.

The Firm has also recognized deferred tax assets in connection with certain tax attributes, including net operating loss ("NOL") carryforwards and foreign tax credit ("FTC") carryforwards. The Firm performs regular reviews to ascertain whether its deferred tax assets are realizable. These reviews include management's estimates and assumptions regarding future taxable income, including foreign source income, and may incorporate various tax planning strategies, including strategies that may be available to utilize NOLs and FTCs before they expire. In connection with these reviews, if it is determined that a deferred tax asset is not realizable, a valuation allowance is established. The valuation allowance may be reversed in a subsequent reporting period if the Firm determines that, based on revised estimates of future taxable income or changes in tax planning strategies, it is more likely than not that all or part of the deferred tax asset will become realizable. As of December 31, 2021, management has determined it is more likely than not that the Firm will realize its deferred tax assets, net of the existing valuation allowance.

The Firm adjusts its unrecognized tax benefits as necessary when new information becomes available, including changes in tax law and regulations, and interactions with taxing authorities. Uncertain tax positions that meet the more-likely-than-not recognition threshold are measured to determine the amount of benefit to recognize. An uncertain tax position is measured at the largest amount of benefit that management believes is more likely than not to be realized upon settlement. It is possible that the reassessment of JPMorgan Chase's unrecognized tax benefits may have a material impact on its effective income tax rate in the period in which the reassessment occurs. Although the Firm believes that its estimates are reasonable, the final tax amount could be different from the amounts reflected in the Firm's income tax provisions and accruals. To the extent that the final outcome of these amounts is different than the amounts recorded, such differences will generally impact the Firm's provision for income taxes in the period in which such a determination is made.

The Firm's provision for income taxes is composed of current and deferred taxes. The current and deferred tax provisions are calculated based on estimates and assumptions that could differ from the actual results reflected in income tax returns filed during the subsequent year. Adjustments based on filed returns are generally recorded in the period when the tax returns are filed and the global tax implications are known, which could impact the Firm's effective tax rate.

Refer to Note 25 for additional information on income taxes.

Litigation reserves

Refer to Note 30 for a description of the significant estimates and judgments associated with establishing litigation reserves.

ACCOUNTING AND REPORTING DEVELOPMENTS

Financial Accounting Standards Board ("FASB") Standards Adopted since January 1, 2021

Standard	Summary of guidance	Effects on financial statements
Reference Rate Reform *Issued March 2020 and updated January 2021*	• Provides optional expedients and exceptions to current accounting guidance when financial instruments, hedge accounting relationships, and other transactions are amended due to reference rate reform. • Provides an election to account for certain contract amendments related to reference rate reform as modifications rather than extinguishments without the requirement to assess the significance of the amendments. • Allows for changes in critical terms of a hedge accounting relationship without automatic termination of that relationship. Provides various practical expedients and elections designed to allow hedge accounting to continue uninterrupted during the transition period. • Provides a one-time election to transfer securities out of the held-to-maturity classification if certain criteria are met. • The January 2021 update provides an election to account for derivatives modified to change the rate used for discounting, margining, or contract price alignment (collectively "discounting transition") as modifications.	• Issued and effective March 12, 2020. The January 7, 2021 update was effective when issued. • The Firm elected to apply certain of the practical expedients related to contract modifications and hedge accounting relationships, and discounting transition beginning in the third quarter of 2020. The discounting transition election was applied retrospectively. The main purpose of the practical expedients is to ease the administrative burden of accounting for contracts impacted by reference rate reform. These elections did not have a material impact on the Consolidated Financial Statements.

FORWARD-LOOKING STATEMENTS

From time to time, the Firm has made and will make forward-looking statements. 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 “anticipate,” “target,” “expect,” “estimate,” “intend,” “plan,” “goal,” “believe,” or other words of similar meaning. Forward-looking statements provide JPMorgan Chase’s current expectations or forecasts of future events, circumstances, results or aspirations. JPMorgan Chase’s disclosures in this 2021 Form 10-K contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The Firm also may make forward-looking statements in its other documents filed or furnished with the SEC. In addition, the Firm’s senior management may make forward-looking statements orally to investors, analysts, representatives of the media and others.

All forward-looking statements are, by their nature, subject to risks and uncertainties, many of which are beyond the Firm’s control. JPMorgan Chase’s actual future results may differ materially from those set forth in its forward-looking statements. While there is no assurance that any list of risks and uncertainties or risk factors is complete, below are certain factors which could cause actual results to differ from those in the forward-looking statements:

- Economic, financial, reputational and other impacts of the COVID-19 pandemic;
- Local, regional and global business, economic and political conditions and geopolitical events;
- Changes in laws, rules, and regulatory requirements, including capital and liquidity requirements affecting the Firm’s businesses, and the ability of the Firm to address those requirements;
- Heightened regulatory and governmental oversight and scrutiny of JPMorgan Chase’s business practices, including dealings with retail customers;
- Changes in trade, monetary and fiscal policies and laws;
- Changes in the level of inflation;
- Changes in income tax laws, rules, and regulations;
- Securities and capital markets behavior, including changes in market liquidity and volatility;
- Changes in investor sentiment or consumer spending or savings behavior;
- Ability of the Firm to manage effectively its capital and liquidity;
- Changes in credit ratings assigned to the Firm or its subsidiaries;
- Damage to the Firm’s reputation;
- Ability of the Firm to appropriately address social, environmental and sustainability concerns that may arise, including from its business activities;
- Ability of the Firm to deal effectively with an economic slowdown or other economic or market disruption, including, but not limited to, in the interest rate environment;
- Technology changes instituted by the Firm, its counterparties or competitors;
- The effectiveness of the Firm’s control agenda;
- Ability of the Firm to develop or discontinue products and services, and the extent to which products or services previously sold by the Firm require the Firm to incur liabilities or absorb losses not contemplated at their initiation or origination;
- Acceptance of the Firm’s new and existing products and services by the marketplace and the ability of the Firm to innovate and to increase market share;
- Ability of the Firm to attract and retain qualified and diverse employees;
- Ability of the Firm to control expenses;
- Competitive pressures;
- Changes in the credit quality of the Firm’s clients, customers and counterparties;
- Adequacy of the Firm’s risk management framework, disclosure controls and procedures and internal control over financial reporting;
- Adverse judicial or regulatory proceedings;
- Changes in applicable accounting policies, including the introduction of new accounting standards;
- Ability of the Firm to determine accurate values of certain assets and liabilities;
- Occurrence of natural or man-made disasters or calamities, including health emergencies, the spread of infectious diseases, epidemics or pandemics, an outbreak or escalation of hostilities or other geopolitical instabilities, the effects of climate change or extraordinary events beyond the Firm’s control, and the Firm’s ability to deal effectively with disruptions caused by the foregoing;
- Ability of the Firm to maintain the security of its financial, accounting, technology, data processing and other operational systems and facilities;
- Ability of the Firm to withstand disruptions that may be caused by any failure of its operational systems or those of third parties;
- Ability of the Firm to effectively defend itself against cyber attacks and other attempts by unauthorized parties to access information of the Firm or its customers or to disrupt the Firm’s systems; and
- The other risks and uncertainties detailed in Part I, Item 1A: Risk Factors in JPMorgan Chase’s 2021 Form 10-K.

Any forward-looking statements made by or on behalf of the Firm speak only as of the date they are made, and JPMorgan Chase does not undertake to update any forward-looking statements. The reader should, however, consult any further disclosures of a forward-looking nature the Firm may make in any subsequent Form 10-Ks, Quarterly Reports on Form 10-Qs, or Current Reports on Form 8-K.

Management's report on internal control over financial reporting

Management of JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, the Firm's principal executive and principal financial officers, or persons performing similar functions, and effected by JPMorgan Chase's Board of Directors, management and other personnel, 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 ("U.S. GAAP").

JPMorgan Chase's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records, that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Firm's assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that receipts and expenditures of the Firm are being made only in accordance with authorizations of JPMorgan Chase's management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Firm's assets that could have a material effect on 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 has completed an assessment of the effectiveness of the Firm's internal control over financial reporting as of December 31, 2021. In making the assessment, management used the "Internal Control — Integrated Framework" ("COSO 2013") promulgated by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Based upon the assessment performed, management concluded that as of December 31, 2021, JPMorgan Chase's internal control over financial reporting was effective based upon the COSO 2013 framework. Additionally, based upon management's assessment, the Firm determined that there were no material weaknesses in its internal control over financial reporting as of December 31, 2021.

The effectiveness of the Firm's internal control over financial reporting as of December 31, 2021, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

James Dimon
Chairman and Chief Executive Officer

Jeremy Barnum
Executive Vice President and Chief Financial Officer

February 22, 2022

To the Board of Directors and Shareholders of JPMorgan Chase & Co.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of JPMorgan Chase & Co. and its subsidiaries (the "Firm") as of December 31, 2021 and 2020, and the related consolidated statements of income, comprehensive income, changes in stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Firm's internal control over financial reporting as of December 31, 2021, 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 Firm as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Firm maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control – Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Firm changed the manner in which it accounts for credit losses on certain financial instruments in 2020.

Basis for Opinions

The Firm'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 Management's report on internal control over financial reporting. Our responsibility is to express opinions on the Firm's consolidated financial statements and on the Firm'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 Firm in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

PricewaterhouseCoopers LLP • 300 Madison Avenue • New York, NY 10017

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 Losses – Portfolio-based component of Wholesale Loan and Credit Card Loan Portfolios

As described in Note 13 to the consolidated financial statements, the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios was $14.0 billion on total portfolio-based retained loans of $711.4 billion at December 31, 2021. The Firm's allowance for loan losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's loan portfolios and considers expected future changes in macroeconomic conditions. The portfolio-based component of the Firm's allowance for loan losses for the wholesale and credit card retained loan portfolios begins with a quantitative calculation of expected credit losses over the expected life of the loan by applying credit loss factors to the estimated exposure at default. The credit loss factors applied are determined based on the weighted average of five internally developed macroeconomic scenarios that take into consideration the Firm's economic outlook as derived through forecast macroeconomic variables, the most significant of which are U.S. unemployment and U.S. real gross domestic product. This quantitative calculation is further adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate.

The principal considerations for our determination that performing procedures relating to the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios is a critical audit matter are (i) the significant judgment and estimation by management in the forecast of macroeconomic variables, specifically U.S. unemployment and U.S. real gross domestic product, as the Firm's forecasts of economic conditions significantly affect its estimate of expected credit losses at the balance sheet date, (ii) the significant judgment and estimation by management in determining the quantitative calculation utilized in their credit loss estimates and the adjustments to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate, which both 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 credit loss estimates and the appropriateness of the adjustments to the credit loss estimates, and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

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 Firm's allowance for loan losses, including controls over model validation and generation of macroeconomic scenarios. These procedures also included, among others, testing management's process for estimating the allowance for loan losses, which involved (i) evaluating the appropriateness of the models and methodologies used in quantitative calculations; (ii) evaluating the reasonableness of forecasts of U.S. unemployment and U.S. real gross domestic product; (iii) testing the completeness and accuracy of data used in the estimate; and (iv) evaluating the reasonableness of management's adjustments to the quantitative output for the impacts of model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate. These procedures also included the use of professionals with specialized skill and knowledge to assist in evaluating the appropriateness of certain models, methodologies and macroeconomic variables.

Fair Value of Certain Level 3 Financial Instruments

As described in Notes 2 and 3 to the consolidated financial statements, the Firm carries $1.2 trillion of its assets and $403.1 billion of its liabilities at fair value on a recurring basis. Included in these balances are $9.6 billion of trading assets and $41.5 billion of liabilities measured at fair value on a recurring basis, collectively financial instruments, which are classified as level 3 as they contain one or more inputs to valuation which are unobservable and significant to their fair value measurement. The Firm utilized internally developed valuation models and unobservable inputs to estimate fair value of the level 3 financial instruments. The unobservable inputs used by management to estimate the fair value of certain of these financial instruments include forward equity prices, volatility relating to interest rates and equity prices and correlation relating to interest rates, equity prices, credit and foreign exchange rates.

The principal considerations for our determination that performing procedures relating to the fair value of certain level 3 financial instruments is a critical audit matter are (i) the significant judgment and estimation by management in determining the inputs to estimate fair value, which in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and in evaluating audit evidence obtained related to the fair value of these financial instruments, and (ii) the audit effort involved the use of professionals with specialized skill and knowledge.

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 Firm's determination of the fair value, including controls over models, 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 financial instruments and comparing 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, developing independent inputs and, as appropriate, evaluating and utilizing management's aforementioned unobservable inputs.

PricewaterhouseCoopers LLP

February 22, 2022

We have served as the Firm's auditor since 1965.

JPMorgan Chase & Co.
Consolidated statements of income

Year ended December 31, (in millions, except per share data)		2021		2020		2019
Revenue						
Investment banking fees	**$**	**13,216**	$	9,486	$	7,501
Principal transactions		**16,304**		18,021		14,018
Lending- and deposit-related fees		**7,032**		6,511		6,626
Asset management, administration and commissions		**21,029**		18,177		16,908
Investment securities gains/(losses)		**(345)**		802		258
Mortgage fees and related income		**2,170**		3,091		2,036
Card income		**5,102**		4,435		5,076
Other income[(a)]		**4,830**		4,865		6,052
Noninterest revenue		**69,338**		65,388		58,475
Interest income		**57,864**		64,523		84,040
Interest expense		**5,553**		9,960		26,795
Net interest income		**52,311**		54,563		57,245
Total net revenue		**121,649**		119,951		115,720
Provision for credit losses		**(9,256)**		17,480		5,585
Noninterest expense						
Compensation expense		**38,567**		34,988		34,155
Occupancy expense		**4,516**		4,449		4,322
Technology, communications and equipment expense		**9,941**		10,338		9,821
Professional and outside services		**9,814**		8,464		8,533
Marketing		**3,036**		2,476		3,351
Other expense		**5,469**		5,941		5,087
Total noninterest expense		**71,343**		66,656		65,269
Income before income tax expense		**59,562**		35,815		44,866
Income tax expense[(a)]		**11,228**		6,684		8,435
Net income	**$**	**48,334**	$	29,131	$	36,431
Net income applicable to common stockholders	**$**	**46,503**	$	27,410	$	34,642
Net income per common share data						
Basic earnings per share	**$**	**15.39**	$	8.89	$	10.75
Diluted earnings per share		**15.36**		8.88		10.72
Weighted-average basic shares		**3,021.5**		3,082.4		3,221.5
Weighted-average diluted shares		**3,026.6**		3,087.4		3,230.4

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated statements of comprehensive income

Year ended December 31, (in millions)		2021		2020		2019
Net income	**$**	**48,334**	$	29,131	$	36,431
Other comprehensive income/(loss), after-tax						
Unrealized gains/(losses) on investment securities		**(5,540)**		4,123		2,855
Translation adjustments, net of hedges		**(461)**		234		20
Fair value hedges		**(19)**		19		30
Cash flow hedges		**(2,679)**		2,320		172
Defined benefit pension and OPEB plans		**922**		212		964
DVA on fair value option elected liabilities		**(293)**		(491)		(965)
Total other comprehensive income/(loss), after-tax		**(8,070)**		6,417		3,076
Comprehensive income	**$**	**40,264**	$	35,548	$	39,507

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated balance sheets

December 31, (in millions, except share data)		2021		2020
Assets				
Cash and due from banks	$	26,438	$	24,874
Deposits with banks		714,396		502,735
Federal funds sold and securities purchased under resale agreements (included **$252,720** and $238,015 at fair value)		261,698		296,284
Securities borrowed (included **$81,463** and $52,983 at fair value)		206,071		160,635
Trading assets (included assets pledged of **$102,710** and $130,645)		433,575		503,126
Available-for-sale securities (amortized cost of **$308,254** and $381,729, net of allowance for credit losses; included assets pledged of **$18,268** and $32,227)		308,525		388,178
Held-to-maturity securities, net of allowance for credit losses		363,707		201,821
Investment securities, net of allowance for credit losses		672,232		589,999
Loans (included **$58,820** and $44,474 at fair value)		1,077,714		1,012,853
Allowance for loan losses		(16,386)		(28,328)
Loans, net of allowance for loan losses		1,061,328		984,525
Accrued interest and accounts receivable		102,570		90,503
Premises and equipment		27,070		27,109
Goodwill, MSRs and other intangible assets		56,691		53,428
Other assets (included **$14,753** and $13,827 at fair value and assets pledged of **$5,298** and $3,739)[(a)]		181,498		151,539
Total assets[(b)]	$	3,743,567	$	3,384,757
Liabilities				
Deposits (included **$11,333** and $14,484 at fair value)	$	2,462,303	$	2,144,257
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$126,435** and $155,735 at fair value)		194,340		215,209
Short-term borrowings (included **$20,015** and $16,893 at fair value)		53,594		45,208
Trading liabilities		164,693		170,181
Accounts payable and other liabilities (included **$5,651** and $3,476 at fair value)[(a)]		262,755		231,285
Beneficial interests issued by consolidated VIEs (included **$12** and $41 at fair value)		10,750		17,578
Long-term debt (included **$74,934** and $76,817 at fair value)		301,005		281,685
Total liabilities[(b)]		3,449,440		3,105,403
Commitments and contingencies (refer to Notes 28, 29 and 30)				
Stockholders' equity				
Preferred stock ($1 par value; authorized 200,000,000 shares: issued **3,483,750** and 3,006,250 shares)		34,838		30,063
Common stock ($1 par value; authorized 9,000,000,000 shares; issued **4,104,933,895** shares)		4,105		4,105
Additional paid-in capital		88,415		88,394
Retained earnings		272,268		236,990
Accumulated other comprehensive income		(84)		7,986
Treasury stock, at cost (**1,160,784,750** and 1,055,499,435 shares)		(105,415)		(88,184)
Total stockholders' equity		294,127		279,354
Total liabilities and stockholders' equity	$	3,743,567	$	3,384,757

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

(b) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Firm at December 31, 2021 and 2020. The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests do not have recourse to the general credit of JPMorgan Chase. The assets and liabilities in the table below include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation. Refer to Note 14 for a further discussion.

December 31, (in millions)		2021		2020
Assets				
Trading assets	$	2,010	$	1,934
Loans		33,024		37,619
All other assets		490		681
Total assets	$	35,524	$	40,234
Liabilities				
Beneficial interests issued by consolidated VIEs	$	10,750	$	17,578
All other liabilities		245		233
Total liabilities	$	10,995	$	17,811

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated statements of changes in stockholders' equity

Year ended December 31, (in millions, except per share data)	2021	2020	2019
Preferred stock			
Balance at January 1	**$ 30,063**	$ 26,993	$ 26,068
Issuance	**7,350**	4,500	5,000
Redemption	**(2,575)**	(1,430)	(4,075)
Balance at December 31	**34,838**	30,063	26,993
Common stock			
Balance at January 1 and December 31	**4,105**	4,105	4,105
Additional paid-in capital			
Balance at January 1	**88,394**	88,522	89,162
Shares issued and commitments to issue common stock for employee share-based compensation awards, and related tax effects	**152**	(72)	(591)
Other	**(131)**	(56)	(49)
Balance at December 31	**88,415**	88,394	88,522
Retained earnings			
Balance at January 1	**236,990**	223,211	199,202
Cumulative effect of change in accounting principles	**—**	(2,650)	62
Net income	**48,334**	29,131	36,431
Dividends declared:			
Preferred stock	**(1,600)**	(1,583)	(1,587)
Common stock (**$3.80**, $3.60 and $3.40 per share for 2021, 2020 and 2019, respectively)	**(11,456)**	(11,119)	(10,897)
Balance at December 31	**272,268**	236,990	223,211
Accumulated other comprehensive income/(loss)			
Balance at January 1	**7,986**	1,569	(1,507)
Other comprehensive income/(loss), after-tax	**(8,070)**	6,417	3,076
Balance at December 31	**(84)**	7,986	1,569
Shares held in RSU Trust, at cost			
Balance at January 1	**—**	(21)	(21)
Liquidation of RSU Trust	**—**	21	—
Balance at December 31	**—**	—	(21)
Treasury stock, at cost			
Balance at January 1	**(88,184)**	(83,049)	(60,494)
Repurchase	**(18,448)**	(6,397)	(24,121)
Reissuance	**1,217**	1,262	1,566
Balance at December 31	**(105,415)**	(88,184)	(83,049)
Total stockholders' equity	**$ 294,127**	$ 279,354	$ 261,330

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

JPMorgan Chase & Co.
Consolidated statements of cash flows

Year ended December 31, (in millions)	2021	2020	2019
Operating activities			
Net income	**$ 48,334**	$ 29,131	$ 36,431
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	**(9,256)**	17,480	5,585
Depreciation and amortization	**7,932**	8,614	8,368
Deferred tax (benefit)/expense[(a)]	**3,748**	(3,573)	1,270
Other	**3,274**	1,649	1,996
Originations and purchases of loans held-for-sale	**(347,864)**	(166,504)	(169,289)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	**336,413**	175,490	171,415
Net change in:			
Trading assets	**85,710**	(148,749)	6,551
Securities borrowed	**(45,635)**	(20,734)	(27,631)
Accrued interest and accounts receivable	**(12,401)**	(18,012)	(78)
Other assets[(a)]	**(11,745)**	(42,430)	(17,777)
Trading liabilities	**(23,190)**	77,198	(14,516)
Accounts payable and other liabilities[(a)]	**43,162**	7,415	(466)
Other operating adjustments	**(398)**	3,115	2,233
Net cash provided by/(used in) operating activities	**78,084**	(79,910)	4,092
Investing activities			
Net change in:			
Federal funds sold and securities purchased under resale agreements	**34,473**	(47,115)	72,396
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**50,897**	21,360	3,423
Purchases	**(111,756)**	(12,400)	(13,427)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**50,075**	57,675	52,200
Proceeds from sales	**162,748**	149,758	70,181
Purchases	**(248,785)**	(397,145)	(242,149)
Proceeds from sales and securitizations of loans held-for-investment	**35,845**	23,559	62,095
Other changes in loans, net	**(91,797)**	(50,263)	(51,743)
All other investing activities, net	**(11,044)**	(7,341)	(5,035)
Net cash (used in) investing activities	**(129,344)**	(261,912)	(52,059)
Financing activities			
Net change in:			
Deposits	**293,764**	602,765	101,002
Federal funds purchased and securities loaned or sold under repurchase agreements	**(20,799)**	31,528	1,347
Short-term borrowings	**7,773**	4,438	(28,561)
Beneficial interests issued by consolidated VIEs	**(4,254)**	1,347	4,289
Proceeds from long-term borrowings	**82,409**	78,686	61,085
Payments of long-term borrowings	**(54,932)**	(105,055)	(69,610)
Proceeds from issuance of preferred stock	**7,350**	4,500	5,000
Redemption of preferred stock	**(2,575)**	(1,430)	(4,075)
Treasury stock repurchased	**(18,408)**	(6,517)	(24,001)
Dividends paid	**(12,858)**	(12,690)	(12,343)
All other financing activities, net	**(1,477)**	(927)	(1,146)
Net cash provided by financing activities	**275,993**	596,645	32,987
Effect of exchange rate changes on cash and due from banks and deposits with banks	**(11,508)**	9,155	(182)
Net increase/(decrease) in cash and due from banks and deposits with banks	**213,225**	263,978	(15,162)
Cash and due from banks and deposits with banks at the beginning of the period	**527,609**	263,631	278,793
Cash and due from banks and deposits with banks at the end of the period	**$ 740,834**	$ 527,609	$ 263,631
Cash interest paid	**$ 5,142**	$ 13,077	$ 29,918
Cash income taxes paid, net[(a)]	**18,737**	8,140	6,224

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information on revisions to operating activities.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Basis of presentation

JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm"), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the U.S., with operations worldwide. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Refer to Note 32 for a further discussion of the Firm's business segments.

The accounting and financial reporting policies of JPMorgan Chase and its subsidiaries conform to U.S. GAAP. Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation. Notably in the first quarter of 2021, the Firm reclassified certain deferred investment tax credits from accounts payable and other liabilities to other assets to be a reduction to the carrying value of the associated tax-oriented investments. Refer to Note 25 for further information.

Consolidation

The Consolidated Financial Statements include the accounts of JPMorgan Chase and other entities in which the Firm has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by the Firm are not assets of JPMorgan Chase and are not included on the Consolidated balance sheets.

The Firm determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

Voting interest entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity's operations. For these types of entities, the Firm's determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Firm has a controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give the Firm control, are consolidated by the Firm.

Investments in companies in which the Firm has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting (which requires the Firm to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in noninterest revenue.

Certain Firm-sponsored asset management funds are structured as limited partnerships or limited liability companies. For many of these entities, the Firm is the general partner or managing member, but the non-affiliated partners or members have the ability to remove the Firm as the general partner or managing member without cause (i.e., kick-out rights), based on a simple majority vote, or the non-affiliated partners or members have rights to participate in important decisions. Accordingly, the Firm does not consolidate these voting interest entities. However, in the limited cases where the non-managing partners or members do not have substantive kick-out or participating rights, the Firm evaluates the funds as VIEs and consolidates the funds if the Firm is the general partner or managing member and has both power and a potentially significant interest.

The Firm's investment companies and asset management funds have investments in both publicly-held and privately-held entities, including investments in buyouts, growth equity and venture opportunities. These investments are accounted for under investment company guidelines and, accordingly, irrespective of the percentage of equity ownership interests held, are carried on the Consolidated balance sheets at fair value, and are recorded in other assets, with income or loss included in noninterest revenue. If consolidated, the Firm retains the accounting under such specialized investment company guidelines.

Variable interest entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity's operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is an SPE. SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE's investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE's assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance; and (2) through its interests in the VIE, the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Firm has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Firm considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Firm has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Firm considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Firm apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE's capital structure; and the reasons why the interests are held by the Firm.

The Firm performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Firm's involvement with a VIE cause the Firm's consolidation conclusion to change.

Refer to Note 14 for further discussion of the Firm's VIEs.

Revenue recognition

Interest income
The Firm recognizes interest income on loans, debt securities, and other debt instruments, generally on a level-yield basis, based on the underlying contractual rate. Refer to Note 7 for further discussion of interest income.

Revenue from contracts with customers
JPMorgan Chase recognizes noninterest revenue from certain contracts with customers, in investment banking fees, deposit-related fees, asset management administration and commissions, and components of card income, when the Firm's related performance obligations are satisfied. Refer to Note 6 for further discussion of the Firm's revenue from contracts with customers.

Principal transactions revenue
JPMorgan Chase carries a portion of its assets and liabilities at fair value. Changes in fair value are reported primarily in principal transactions revenue. Refer to Notes 2 and 3 for further discussion of fair value measurement. Refer to Note 6 for further discussion of principal transactions revenue.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

JPMorgan Chase revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in the Consolidated statements of comprehensive income. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Firm has elected to net such balances where it has determined that the specified conditions are met.

The Firm uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivative contracts, resale, repurchase, securities borrowed and securities loaned agreements. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "out of the money" transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under repurchase agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the "demanding party"). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

Refer to Note 5 for further discussion of the Firm's derivative instruments. Refer to Note 11 for further discussion of the Firm's securities financing agreements.

Statements of cash flows

For JPMorgan Chase's Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks and deposits with banks on the Consolidated balance sheets.

Accounting standard adopted January 1, 2020

Financial Instruments – Credit Losses ("CECL")

The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. Prior to the adoption of the CECL accounting guidance, the Firm's allowance for credit losses represented management's estimate of probable credit losses inherent in the Firm's retained loan portfolios and certain lending-related commitments. The adoption of CECL on January 1, 2020, resulted in a $2.7 billion decrease to retained earnings.

Notes to consolidated financial statements

Significant accounting policies

The following table identifies JPMorgan Chase's other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Note 2 – Fair value measurement

JPMorgan Chase carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Firm's Consolidated balance sheets). Certain assets, liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use, as inputs, observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Firm could result in the Firm deriving a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. The Firm's Valuation Control Group ("VCG"), which is part of the Firm's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Firm's positions are recorded at fair value. In addition, the Firm's Valuation Governance Forum ("VGF"), which is composed of senior finance and risk executives, is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm. The Firmwide VGF is chaired by the Firmwide head of the VCG (under the direction of the Firm's Controller), and includes sub-forums covering the CIB, CCB, CB, AWM and certain corporate functions including Treasury and CIO.

Price verification process

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (refer to the discussion below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Firm:

- Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are made based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.
- The Firm manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position, including the size of the adverse market move that is likely to occur during the period required to reduce the net open risk position to a normal market-size.
- Uncertainty adjustments related to unobservable parameters may be made when positions are valued

using prices or input parameters to valuation models that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Adjustments are made to reflect the uncertainty inherent in the resulting valuation estimate.

- Where appropriate, the Firm also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (CVA), the Firm's own creditworthiness (DVA) and the impact of funding (FVA), using a consistent framework across the Firm. Refer to Credit and funding adjustments on page 186 of this Note for more information on such adjustments.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs in those models.

Under the Firm's Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Firm's policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Fair value hierarchy

A three-level fair value hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The fair value hierarchy is based on the observability of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Firm to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the fair value hierarchy.

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: refer to the discussion of derivatives below for further information. • Market rates for the respective maturity • Collateral characteristics	Predominantly level 2
Loans and lending-related commitments — wholesale Loans carried at fair value (trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of CDS; or benchmark credit curves developed by the Firm, by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans — consumer Loans carried at fair value — conforming residential mortgage loans expected to be sold	Fair value is based on observable market prices for mortgage-backed securities with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2
Investment and trading securities	Quoted market prices	Level 1
	In the absence of quoted market prices, securities are valued based on: • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations ("CLOs") specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Derivatives	Exchange-traded derivatives that are actively traded and valued using the exchange price.	Level 1
	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Interest rate and FX exotic options specific inputs include: • Interest rate volatility • Interest rate spread volatility • Interest rate correlation • Interest rate-FX correlation • Foreign exchange correlation • Interest rate curve Structured credit derivatives specific inputs include: • Credit correlation between the underlying debt instruments • CDS spreads and recovery rates Equity option specific inputs include: • Forward equity price • Equity volatility • Equity correlation • Equity-FX correlation • Equity-IR correlation Commodity derivatives specific inputs include: • Forward commodity price • Commodity volatility • Commodity correlation Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA). Refer to page 186 of this Note.	Level 2 or 3
Mortgage servicing rights	Refer to Mortgage servicing rights in Note 15.	Level 3
Private equity direct investments	Fair value is estimated using all available information; the range of potential inputs include: • Transaction prices • Trading multiples of comparable public companies • Operating performance of the underlying portfolio company • Adjustments as required, since comparable public companies are not identical to the company being valued, and for company-specific issues and lack of liquidity. • Additional available inputs relevant to the investment.	Level 2 or 3
Fund investments (e.g., mutual/collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value	
	• NAV is supported by the ability to redeem and purchase at the NAV level.	Level 1
	• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited.	Level 2 or 3[(a)]
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available. In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

Product/instrument	Valuation methodology	Classification in the fair value hierarchy
Structured notes (included in deposits, short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Firm's own credit risk (DVA). Refer to page 186 of this Note.	Level 2 or 3

The following table presents the assets and liabilities reported at fair value as of December 31, 2021 and 2020, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2021 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[f]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 252,720	$ –	$ –	$ 252,720
Securities borrowed	–	81,463	–	–	81,463
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	38,944	265	–	39,209
Residential – nonagency	–	2,358	28	–	2,386
Commercial – nonagency	–	1,506	10	–	1,516
Total mortgage-backed securities	–	42,808	303	–	43,111
U.S. Treasury, GSEs and government agencies[a]	68,527	9,181	–	–	77,708
Obligations of U.S. states and municipalities	–	7,068	7	–	7,075
Certificates of deposit, bankers' acceptances and commercial paper	–	852	–	–	852
Non-U.S. government debt securities	26,982	44,581	81	–	71,644
Corporate debt securities	–	24,491	332	–	24,823
Loans	–	7,366	708	–	8,074
Asset-backed securities	–	2,668	26	–	2,694
Total debt instruments	95,509	139,015	1,457	–	235,981
Equity securities	86,904	1,741	662	–	89,307
Physical commodities[b]	5,357	20,788	–	–	26,145
Other	–	24,850	160	–	25,010
Total debt and equity instruments[c]	187,770	186,394	2,279	–	376,443
Derivative receivables:					
Interest rate	1,072	267,493	2,020	(248,611)	21,974
Credit	–	9,321	518	(8,808)	1,031
Foreign exchange	134	168,590	855	(156,954)	12,625
Equity	–	65,139	3,492	(58,650)	9,981
Commodity	–	26,232	421	(15,183)	11,470
Total derivative receivables	1,206	536,775	7,306	(488,206)	57,081
Total trading assets[d]	188,976	723,169	9,585	(488,206)	433,524
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	4	72,539	–	–	72,543
Residential – nonagency	–	6,070	–	–	6,070
Commercial – nonagency	–	4,949	–	–	4,949
Total mortgage-backed securities	4	83,558	–	–	83,562
U.S. Treasury and government agencies	177,463	–	–	–	177,463
Obligations of U.S. states and municipalities	–	15,860	–	–	15,860
Non-U.S. government debt securities	5,430	10,779	–	–	16,209
Corporate debt securities	–	160	161	–	321
Asset-backed securities:					
Collateralized loan obligations	–	9,662	–	–	9,662
Other	–	5,448	–	–	5,448
Total available-for-sale securities	182,897	125,467	161	–	308,525
Loans[e]	–	56,887	1,933	–	58,820
Mortgage servicing rights	–	–	5,494	–	5,494
Other assets[d]	9,558	4,139	306	–	14,003
Total assets measured at fair value on a recurring basis	$ 381,431	$ 1,243,845	$ 17,479	$ (488,206)	$ 1,154,549
Deposits	$ –	$ 9,016	$ 2,317	$ –	$ 11,333
Federal funds purchased and securities loaned or sold under repurchase agreements	–	126,435	–	–	126,435
Short-term borrowings	–	17,534	2,481	–	20,015
Trading liabilities:					
Debt and equity instruments[c]	87,831	26,716	30	–	114,577
Derivative payables:					
Interest rate	981	237,714	2,036	(232,537)	8,194
Credit	–	10,468	444	(10,032)	880
Foreign exchange	123	174,349	1,274	(161,649)	14,097
Equity	–	72,609	7,118	(62,494)	17,233
Commodity	–	26,600	1,328	(18,216)	9,712
Total derivative payables	1,104	521,740	12,200	(484,928)	50,116
Total trading liabilities	88,935	548,456	12,230	(484,928)	164,693
Accounts payable and other liabilities	5,115	467	69	–	5,651
Beneficial interests issued by consolidated VIEs	–	12	–	–	12
Long-term debt	–	50,560	24,374	–	74,934
Total liabilities measured at fair value on a recurring basis	$ 94,050	$ 752,480	$ 41,471	$ (484,928)	$ 403,073

	Fair value hierarchy				
December 31, 2020 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[f]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 238,015	$ –	$ –	$ 238,015
Securities borrowed	–	52,983	–	–	52,983
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	68,395	449	–	68,844
Residential – nonagency	–	2,138	28	–	2,166
Commercial – nonagency	–	1,327	3	–	1,330
Total mortgage-backed securities	–	71,860	480	–	72,340
U.S. Treasury, GSEs and government agencies[a]	104,263	10,996	–	–	115,259
Obligations of U.S. states and municipalities	–	7,184	8	–	7,192
Certificates of deposit, bankers' acceptances and commercial paper	–	1,230	–	–	1,230
Non-U.S. government debt securities	26,772	40,671	182	–	67,625
Corporate debt securities	–	21,017	507	–	21,524
Loans	–	6,101	893	–	6,994
Asset-backed securities	–	2,304	28	–	2,332
Total debt instruments	131,035	161,363	2,098	–	294,496
Equity securities	97,035	2,652	476 [g]	–	100,163
Physical commodities[b]	6,382	5,189	–	–	11,571
Other	–	21,351 [g]	49 [g]	–	21,400
Total debt and equity instruments[c]	234,452	190,555	2,623	–	427,630
Derivative receivables:					
Interest rate [g]	2,318	387,023	2,307	(355,923)	35,725
Credit [g]	–	12,721	624	(12,665)	680
Foreign exchange	146	205,127	987	(190,479)	15,781
Equity	–	67,093 [g]	3,519	(54,125)	16,487
Commodity	–	21,272	231	(14,732)	6,771
Total derivative receivables	2,464	693,236	7,668	(627,924)	75,444
Total trading assets[d]	236,916	883,791	10,291	(627,924)	503,074
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a][g]	7	113,294	–	–	113,301
Residential – nonagency	–	10,233	–	–	10,233
Commercial – nonagency	–	2,856	–	–	2,856
Total mortgage-backed securities	7	126,383	–	–	126,390
U.S. Treasury and government agencies	201,951	–	–	–	201,951
Obligations of U.S. states and municipalities	–	20,396	–	–	20,396
Non-U.S. government debt securities	13,135	9,793	–	–	22,928
Corporate debt securities	–	216	–	–	216
Asset-backed securities:					
Collateralized loan obligations	–	10,048	–	–	10,048
Other	–	6,249	–	–	6,249
Total available-for-sale securities	215,093	173,085	–	–	388,178
Loans[e]	–	42,169	2,305	–	44,474
Mortgage servicing rights	–	–	3,276	–	3,276
Other assets[d]	8,110	4,561	538	–	13,209
Total assets measured at fair value on a recurring basis	$ 460,119	$ 1,394,604	$ 16,410	$ (627,924)	$ 1,243,209
Deposits	$ –	$ 11,571	$ 2,913	$ –	$ 14,484
Federal funds purchased and securities loaned or sold under repurchase agreements	–	155,735	–	–	155,735
Short-term borrowings	–	14,473	2,420	–	16,893
Trading liabilities:					
Debt and equity instruments[c]	82,669	16,838	51	–	99,558
Derivative payables:					
Interest rate [g]	2,496	349,442	2,049	(340,975)	13,012
Credit [g]	–	13,984	848	(12,837)	1,995
Foreign exchange	132	214,373	1,421	(194,493)	21,433
Equity	–	74,032	7,381	(55,515)	25,898
Commodity	–	21,767	962	(14,444)	8,285
Total derivative payables	2,628	673,598	12,661	(618,264)	70,623
Total trading liabilities	85,297	690,436	12,712	(618,264)	170,181
Accounts payable and other liabilities	2,895	513	68	–	3,476
Beneficial interests issued by consolidated VIEs	–	41	–	–	41
Long-term debt	–	53,420	23,397	–	76,817
Total liabilities measured at fair value on a recurring basis	$ 88,192	$ 926,189	$ 41,510	$ (618,264)	$ 437,627

(a) At December 31, 2021 and 2020, included total U.S. GSE obligations of $73.9 billion and $117.6 billion, respectively, which were mortgage-related.

(b) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Firm's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Firm's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. Refer to Note 5 for a further discussion of the Firm's hedge accounting relationships. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.

(c) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

(d) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2021 and 2020, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $801 million and $670 million, respectively. Included in these balances at December 31, 2021 and 2020, were trading assets of $51 million and $52 million, respectively, and other assets of $750 million and $618 million, respectively.
(e) At December 31, 2021 and 2020, included $26.2 billion and $15.1 billion, respectively, of residential first-lien mortgages, and $8.2 billion and $6.3 billion, respectively, of commercial first-lien mortgages. Residential mortgage loans include conforming mortgage loans originated with the intent to sell to U.S. GSEs and government agencies of $13.6 billion and $8.4 billion, respectively.
(f) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.
(g) Prior-period amounts have been revised to conform with the current presentation.

Level 3 valuations

The Firm has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). Refer to pages 169-173 of this Note for further information on the Firm's valuation process and a detailed discussion of the determination of fair value for individual financial instruments.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Firm's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and the weighted or arithmetic averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Firm manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Firm's view, the input range, weighted and arithmetic average values do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Firm's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Firm and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Firm at each balance sheet date.

Level 3 inputs[(a)]

December 31, 2021							
Product/Instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs[(g)]	Range of input values			Average[(i)]
Residential mortgage-backed securities and loans[(b)]	$ 1,181	Discounted cash flows	Yield	0%	-	15%	4%
			Prepayment speed	0%	-	15%	14%
			Conditional default rate	0%	-	2%	0%
			Loss severity	0%	-	110%	4%
Commercial mortgage-backed securities and loans[(c)]	391	Market comparables	Price	$0	-	$103	$84
Corporate debt securities	493	Market comparables	Price	$0	-	$154	$87
Loans[(d)]	1,372	Market comparables	Price	$5	-	$107	$89
Non-U.S. government debt securities	81	Market comparables	Price	$87	-	$103	$96
Net interest rate derivatives	(26)	Option pricing	Interest rate volatility	5bps	-	544bps	106bps
			Interest rate spread volatility	11bps	-	23bps	14bps
			Interest rate correlation	(65)%	-	87%	25%
			IR-FX correlation	(35)%	-	50%	(2)%
	10	Discounted cash flows	Prepayment speed	0%	-	30%	8%
Net credit derivatives	26	Discounted cash flows	Credit correlation	35%	-	65%	46%
			Credit spread	1bps	-	4,396bps	384bps
			Recovery rate	35%	-	67%	51%
	48	Market comparables	Price	$0	-	$115	$80
Net foreign exchange derivatives	(320)	Option pricing	IR-FX correlation	(40)%	-	65%	17%
	(99)	Discounted cash flows	Prepayment speed		9%		9%
			Interest rate curve	0%	-	28%	4%
Net equity derivatives	(3,626)	Option pricing	Forward equity price[(h)]	63%	-	122%	99%
			Equity volatility	4%	-	132%	32%
			Equity correlation	17%	-	100%	55%
			Equity-FX correlation	(79)%	-	59%	(27)%
			Equity-IR correlation	15%	-	50%	27%
Net commodity derivatives	(907)	Option pricing	Oil commodity forward	$631 / MT	-	$747 / MT	$689 / MT
			Industrial metals commodity forward	$2,610 / MT	-	$3,482 / MT	$3,046 / MT
			Commodity volatility	5%	-	185%	95%
			Commodity correlation	(50)%	-	76%	13%
MSRs	5,494	Discounted cash flows	Refer to Note 15				
Long-term debt, short-term borrowings, and deposits[(e)]	28,236	Option pricing	Interest rate volatility	5bps	-	544bps	106bps
			Interest rate correlation	(65)%	-	87%	25%
			IR-FX correlation	(35)%	-	50%	(2)%
			Equity correlation	17%	-	100%	55%
			Equity-FX correlation	(79)%	-	59%	(27)%
			Equity-IR correlation	15%	-	50%	27%
	936	Discounted cash flows	Credit correlation	35%	-	65%	46%
Other level 3 assets and liabilities, net[(f)]	1,062						

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
(b) Comprises U.S. GSE and government agency securities of $265 million, nonagency securities of $28 million and non-trading loans of $888 million.
(c) Comprises nonagency securities of $10 million, trading loans of $40 million and non-trading loans of $341 million.
(d) Comprises trading loans of $668 million and non-trading loans of $704 million.
(e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Firm that are financial instruments that typically contain embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
(f) Includes equity securities of $806 million including $144 million in Other assets, for which quoted prices are not readily available and the fair value is generally based on internal valuation techniques such as EBITDA multiples and comparable analysis. All other level 3 assets and liabilities are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.
(h) Forward equity price is expressed as a percentage of the current equity price.
(i) Amounts represent weighted averages except for derivative-related inputs where arithmetic averages are used.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Firm's positions.

Yield – The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread – The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Firm. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, LTV ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed – The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate – The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Firm's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity – The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security investment depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity, foreign exchange and commodity) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Interest rate curve – represents the relationship of interest rates over differing tenors. The interest rate curve is used to set interest rate and foreign exchange derivative cash flows and is also a pricing input used in the discounting of any derivative cash flow.

Forward price - Forward price is the price at which the buyer agrees to purchase the asset underlying a forward contract on the predetermined future delivery date, and is such that the value of the contract is zero at inception.

The forward price is used as an input in the valuation of certain derivatives and depends on a number of factors including interest rates, the current price of the underlying asset, and the expected income to be received and costs to be incurred by the seller as a result of holding that asset until the delivery date. An increase in the forward can result in an increase or a decrease in a fair value measurement.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Firm within level 3 of the fair value hierarchy for the years ended December 31, 2021, 2020 and 2019. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable inputs to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, the Firm risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Firm's risk management activities related to such level 3 instruments.

Year ended December 31, 2021 (in millions)	Fair value at January 1, 2021	Total realized/ unrealized gains/(losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2021
	Fair value measurements using significant unobservable inputs								
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 449	$ (28)	$ 21	$ (67)	$ (110)	$ 1	$ (1)	$ 265	$ (31)
Residential – nonagency	28	–	26	(24)	(5)	4	(1)	28	(3)
Commercial – nonagency	3	5	12	(7)	(17)	14	–	10	(2)
Total mortgage-backed securities	480	(23)	59	(98)	(132)	19	(2)	303	(36)
Obligations of U.S. states and municipalities	8	–	–	–	(1)	–	–	7	–
Non-U.S. government debt securities	182	(14)	359	(332)	(7)	–	(107)	81	(10)
Corporate debt securities	507	(23)	404	(489)	(4)	162	(225)	332	(16)
Loans	893	2	994	(669)	(287)	648	(873)	708	(20)
Asset-backed securities	28	28	76	(99)	(2)	2	(7)	26	(2)
Total debt instruments	2,098	(30)	1,892	(1,687)	(433)	831	(1,214)	1,457	(84)
Equity securities	476	(77)	378	(168)	–	164	(111)	662	(335)
Other	49	74	233	–	(98)	5	(103)	160	31
Total trading assets – debt and equity instruments	2,623	(33) [c]	2,503	(1,855)	(531)	1,000	(1,428)	2,279	(388) [c]
Net derivative receivables:[b]									
Interest rate	258	1,789	116	(192)	(2,011)	112	(88)	(16)	282
Credit	(224)	130	6	(12)	146	34	(6)	74	141
Foreign exchange	(434)	(209)	110	(110)	222	(12)	14	(419)	13
Equity	(3,862)	(480)	1,285	(2,813)	1,758	315	171	(3,626)	(155)
Commodity	(731)	(728)	145	(493)	916	(4)	(12)	(907)	(426)
Total net derivative receivables	(4,993)	502 [c]	1,662	(3,620)	1,031	445	79	(4,894)	(145) [c]
Available-for-sale securities:									
Mortgage-backed securities	–	–	–	–	–	–	–	–	–
Corporate debt securities	–	(1)	162	–	–	–	–	161	(1)
Total available-for-sale securities	–	(1)	162	–	–	–	–	161	(1)
Loans	2,305	(87) [c]	612	(439)	(965)	1,301	(794)	1,933	(59) [c]
Mortgage servicing rights	3,276	98 [d]	3,022	(114)	(788)	–	–	5,494	98 [d]
Other assets	538	16 [c]	9	(17)	(239)	–	(1)	306	11 [c]

Year ended December 31, 2021 (in millions)	Fair value at January 1, 2021	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2021
	Fair value measurements using significant unobservable inputs									
Liabilities:[a]										
Deposits	$ 2,913	$ (80) [c][e]	$ –	$ –	$ 431	$ (467)	$ 2	$ (482)	$ 2,317	$ (77) [c][e]
Short-term borrowings	2,420	(1,391) [c][e]	–	–	6,823	(5,308)	9	(72)	2,481	(83) [c][e]
Trading liabilities – debt and equity instruments	51	(8) [c]	(101)	38	–	–	64	(14)	30	(157) [c]
Accounts payable and other liabilities	68	8 [c]	–	1	–	–	–	(8)	69	8 [c]
Beneficial interests issued by consolidated VIEs	–	–	–	–	–	–	–	–	–	–
Long-term debt	23,397	369 [c][e]	–	–	13,505	(12,191)	103	(809)	24,374	87 [c][e]

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs: Fair value at January 1, 2020	Total realized/ unrealized gains/ (losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2020	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2020
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 797	$ (172)	$ 134	$ (149)	$ (161)	$ –	$ –	$ 449	$ (150)
Residential – nonagency	23	2	15	(5)	(4)	–	(3)	28	(1)
Commercial – nonagency	4	–	1	–	(1)	2	(3)	3	–
Total mortgage-backed securities	824	(170)	150	(154)	(166)	2	(6)	480	(151)
Obligations of U.S. states and municipalities	10	–	–	(1)	(1)	–	–	8	–
Non-U.S. government debt securities	155	21	281	(245)	(7)	–	(23)	182	11
Corporate debt securities	558	(23)	582	(205)	(236)	411	(580)	507	(25)
Loans	673	(73)	1,112	(484)	(182)	791	(944)	893	(40)
Asset-backed securities	37	(3)	44	(40)	(9)	9	(10)	28	(4)
Total debt instruments	2,257	(248)	2,169	(1,129)	(601)	1,213	(1,563)	2,098	(209)
Equity securities[h]	196	(137)	412	(376)	(1)	535	(153)	476	(82)
Other[h]	232	333	229	(9)	(497)	6	(245)	49	268
Total trading assets – debt and equity instruments	2,685	(52) [c]	2,810	(1,514)	(1,099)	1,754	(1,961)	2,623	(23) [c]
Net derivative receivables:[b]									
Interest rate	(332)	2,682	308	(148)	(2,228)	(332)	308	258	325
Credit	(139)	(212)	73	(154)	181	59	(32)	(224)	(110)
Foreign exchange	(607)	49	49	(24)	83	13	3	(434)	116
Equity	(3,395)	(65)	1,664	(2,317)	1,162	(935)	24	(3,862)	(556)
Commodity	(16)	(546)	27	(241)	356	(310)	(1)	(731)	267
Total net derivative receivables	(4,489)	1,908 [c]	2,121	(2,884)	(446)	(1,505)	302	(4,993)	42 [c]
Available-for-sale securities:									
Mortgage-backed securities	1	–	–	–	(1)	–	–	–	–
Corporate debt securities	–	–	–	–	–	–	–	–	–
Total available-for-sale securities	1	–	–	–	(1)	–	–	–	–
Loans	516	(243) [c]	962	(84)	(733)	2,571	(684)	2,305	(18) [c]
Mortgage servicing rights	4,699	(1,540) [d]	1,192	(176)	(899)	–	–	3,276	(1,540) [d]
Other assets	917	(63) [c]	75	(104)	(320)	40	(7)	538	(3) [c]

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs: Fair value at January 1, 2020	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2020	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2020
Liabilities:[a]										
Deposits	$ 3,360	$ 165 [c][e]	$ –	$ –	$ 671	$ (605)	$ 265	$ (943)	$ 2,913	$ 455 [c][e]
Short-term borrowings	1,674	(338) [c][e]	–	–	5,140	(4,115)	105	(46)	2,420	143 [c][e]
Trading liabilities – debt and equity instruments	41	(2) [c]	(126)	14	–	(4)	136	(8)	51	(1) [c]
Accounts payable and other liabilities	45	33 [c]	(87)	37	–	–	47	(7)	68	28 [c]
Beneficial interests issued by consolidated VIEs	–	–	–	–	–	–	–	–	–	–
Long-term debt	23,339	40 [c][e]	–	–	9,883	(9,833)	1,250	(1,282)	23,397	1,920 [c][e]

Year ended December 31, 2019 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2019
	Fair value at January 1, 2019	Total realized/ unrealized gains/ (losses)	Purchases[f]	Sales	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2019	
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 549	$ (62)	$ 773	$ (310)	$ (134)	$ 1	$ (20)	$ 797	$ (58)
Residential – nonagency	64	25	83	(86)	(20)	15	(58)	23	2
Commercial – nonagency	11	2	20	(26)	(14)	15	(4)	4	1
Total mortgage-backed securities	624	(35)	876	(422)	(168)	31	(82)	824	(55)
Obligations of U.S. states and municipalities	689	13	85	(159)	(8)	–	(610)	10	13
Non-U.S. government debt securities	155	1	290	(287)	–	14	(18)	155	4
Corporate debt securities	334	47	437	(247)	(52)	112	(73)	558	40
Loans	738	29	456	(519)	(82)	437	(386)	673	13
Asset-backed securities	127	–	37	(93)	(40)	28	(22)	37	(3)
Total debt instruments	2,667	55	2,181	(1,727)	(350)	622	(1,191)	2,257	12
Equity securities	232	(41)	58	(103)	(22)	181	(109)	196	(18)
Other	301	(36)	50	(26)	(54)	2	(5)	232	91
Total trading assets – debt and equity instruments	3,200	(22) (c)	2,289	(1,856)	(426)	805	(1,305)	2,685	85 (c)
Net derivative receivables:[b]									
Interest rate	(38)	(394)	109	(125)	5	(7)	118	(332)	(599)
Credit	(107)	(36)	20	(9)	8	29	(44)	(139)	(127)
Foreign exchange	(297)	(551)	17	(67)	312	(22)	1	(607)	(380)
Equity	(2,225)	(310)	397	(573)	(503)	(405)	224	(3,395)	(1,608)
Commodity	(1,129)	497	36	(348)	89	(6)	845	(16)	130
Total net derivative receivables	(3,796)	(794) (c)	579	(1,122)	(89)	(411)	1,144	(4,489)	(2,584) (c)
Available-for-sale securities:									
Mortgage-backed securities	1	–	–	–	–	–	–	1	–
Corporate debt securities	–	–	–	–	–	–	–	–	–
Total available-for-sale securities	1	–	–	–	–	–	–	1	–
Loans	856	59 (c)	236	(188)	(482)	188	(153)	516	38 (c)
Mortgage servicing rights	6,130	(1,180) (d)	1,489	(789)	(951)	–	–	4,699	(1,180) (d)
Other assets	1,161	(150) (c)	229	(166)	(156)	6	(7)	917	(180) (c)

Year ended December 31, 2019 (in millions)	Fair value measurements using significant unobservable inputs									Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2019
	Fair value at January 1, 2019	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2019	
Liabilities:[a]										
Deposits	$ 4,169	$ 278 (c)(e)	$ –	$ –	$ 916	$ (806)	$ 12	$ (1,209)	$ 3,360	$ 307 (c)(e)
Short-term borrowings	1,523	229 (c)(e)	–	–	3,441	(3,356)	85	(248)	1,674	155 (c)(e)
Trading liabilities – debt and equity instruments	50	2 (c)	(22)	41	–	1	16	(47)	41	3 (c)
Accounts payable and other liabilities	10	(2) (c)	(84)	115	–	–	6	–	45	29 (c)
Beneficial interests issued by consolidated VIEs	1	(1) (c)	–	–	–	–	–	–	–	–
Long-term debt	19,418	2,815 (c)(e)	–	–	10,441	(8,538)	651	(1,448)	23,339	2,822 (c)(e)

(a) Level 3 assets at fair value as a percentage of total Firm assets at fair value (including assets measured at fair value on a nonrecurring basis) were 2%, 1% and 2% at December 31, 2021, 2020 and 2019, respectively. Level 3 liabilities at fair value as a percentage of total Firm liabilities at fair value (including liabilities measured at fair value on a nonrecurring basis) were 10%, 9% and 16% at December 31, 2021, 2020 and 2019, respectively.

(b) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.
(c) Predominantly reported in principal transactions revenue, except for changes in fair value for CCB mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
(d) Changes in fair value for MSRs are reported in mortgage fees and related income.
(e) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and were not material for the years ended December 31, 2021, 2020 and 2019. Unrealized (gains)/losses are reported in OCI, and they were $258 million, $221 million and $319 million for the years ended December 31, 2021, 2020 and 2019, respectively.
(f) Loan originations are included in purchases.
(g) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidations associated with beneficial interests in VIEs and other items.
(h) Prior-period amounts have been revised to conform with the current presentation.

Level 3 analysis

Consolidated balance sheets changes

The following describes significant changes to level 3 assets since December 31, 2020, for those items measured at fair value on a recurring basis. Refer to Assets and liabilities measured at fair value on a nonrecurring basis on page 187 for further information on changes impacting items measured at fair value on a nonrecurring basis.

For the year ended December 31, 2021

Level 3 assets were $17.5 billion at December 31, 2021, reflecting an increase of $1.1 billion from December 31, 2020.

The increase for the year ended December 31, 2021 was predominantly driven by:

- $2.2 billion increase in MSRs,

partially offset by

- $287 million decrease in gross interest rate derivative receivables due to settlements net of gains.
- $372 million decrease in non-trading loans due to settlements net of transfers.

Refer to Note 15 for information on MSRs.

Refer to the sections below for additional information.

Transfers between levels for instruments carried at fair value on a recurring basis

During the year ended December 31, 2021, significant transfers from level 2 into level 3 included the following:

- $1.0 billion of total debt and equity instruments, largely due to trading loans, driven by a decrease in observability.
- $1.5 billion of gross equity derivative receivables and $1.2 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.3 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2021, significant transfers from level 3 into level 2 included the following:

- $1.4 billion of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $1.9 billion of gross equity derivative receivables and $2.1 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $794 million of non-trading loans driven by an increase in observability.
- $809 million of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2020, significant transfers from level 2 into level 3 included the following:

- $1.8 billion of total debt and equity instruments, predominantly equity securities and trading loans, driven by a decrease in observability.
- $2.6 billion of gross equity derivative receivables and $3.5 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $880 million of gross interest rate derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $2.6 billion of non-trading loans driven by a decrease in observability.
- $1.2 billion of long-term debt driven by a decrease in observability and an increase in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2020, significant transfers from level 3 into level 2 included the following:

- $2.0 billion of total debt and equity instruments, predominantly due to corporate debt and trading loans, driven by an increase in observability.
- $2.4 billion of gross equity derivative receivables and $2.4 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $943 million of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.3 billion of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2019, significant transfers from level 2 into level 3 included the following:

- $993 million of total debt and equity instruments, the majority of which were trading loans, driven by a decrease in observability.
- $904 million of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.

During the year ended December 31, 2019, significant transfers from level 3 into level 2 included the following:

- $1.5 billion of total debt and equity instruments, the majority of which were obligations of U.S. states and municipalities and trading loans, driven by an increase in observability.
- $1.1 billion of gross equity derivative receivables and $1.3 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $962 million of gross commodities derivative payables as a result of an increase in observability.
- $1.2 billion of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.4 billion of long-term debt as a result of an increase in observability and a decrease in the significance of unobservable inputs.

All transfers are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2021, 2020 and 2019. These amounts exclude any effects of the Firm's risk management activities where the financial instruments are classified as level 1 and 2 of the fair value hierarchy. Refer to Changes in level 3 recurring fair value measurements rollforward tables on pages 180-184 for further information on these instruments.

2021

- $495 million of net gains on assets, driven by gains in net interest rate derivative receivables due to market movements, partially offset by losses in net equity derivative receivables and net commodity derivative receivables due to market movements.
- $1.1 billion of net gains on liabilities, driven by gains in short-term borrowings due to market movements.

2020

- $10 million of net gains on assets driven by gains in net interest rate derivative receivables due to market movements largely offset by losses in MSRs reflecting faster prepayment speeds on lower rates.
- $102 million of net gains on liabilities driven by market movements in short-term borrowings.

2019

- $2.1 billion of net losses on assets largely due to MSRs reflecting faster prepayment speeds on lower rates.
- $3.3 billion of net losses on liabilities predominantly driven by market movements in long-term debt.

Refer to Note 15 for additional information on MSRs.

Credit and funding adjustments – derivatives

Derivatives are generally valued using models that use as their basis observable market parameters. These market parameters generally do not consider factors such as counterparty nonperformance risk, the Firm's own credit quality, and funding costs. Therefore, it is generally necessary to make adjustments to the base estimate of fair value to reflect these factors.

CVA represents the adjustment, relative to the relevant benchmark interest rate, necessary to reflect counterparty nonperformance risk. The Firm estimates CVA using a scenario analysis to estimate the expected positive credit exposure across all of the Firm's existing positions with each counterparty, and then estimates losses based on the probability of default and estimated recovery rate as a result of a counterparty credit event considering contractual factors designed to mitigate the Firm's credit exposure, such as collateral and legal rights of offset. The key inputs to this methodology are (i) the probability of a default event occurring for each counterparty, as derived from observed or estimated CDS spreads; and (ii) estimated recovery rates implied by CDS spreads, adjusted to consider the differences in recovery rates as a derivative creditor relative to those reflected in CDS spreads, which generally reflect senior unsecured creditor risk.

FVA represents the adjustment to reflect the impact of funding and is recognized where there is evidence that a market participant in the principal market would incorporate it in a transfer of the instrument. The Firm's FVA framework, applied to uncollateralized (including partially collateralized) over-the-counter ("OTC") derivatives incorporates key inputs such as: (i) the expected funding requirements arising from the Firm's positions with each counterparty and collateral arrangements; and (ii) the estimated market funding cost in the principal market which, for derivative liabilities, considers the Firm's credit risk (DVA). For collateralized derivatives, the fair value is estimated by discounting expected future cash flows at the relevant overnight indexed swap rate given the underlying collateral agreement with the counterparty, and therefore a separate FVA is not necessary.

The following table provides the impact of credit and funding adjustments on principal transactions revenue in the respective periods, excluding the effect of any associated hedging activities. The FVA presented below includes the impact of the Firm's own credit quality on the inception value of liabilities as well as the impact of changes in the Firm's own credit quality over time.

Year ended December 31, (in millions)	2021	2020	2019
Credit and funding adjustments:			
Derivatives CVA	**$ 362**	$ (337)	$ 241
Derivatives FVA	**47**	(64)	199

Valuation adjustments on fair value option elected liabilities

The valuation of the Firm's liabilities for which the fair value option has been elected requires consideration of the Firm's own credit risk. DVA on fair value option elected liabilities reflects changes (subsequent to the issuance of the liability) in the Firm's probability of default and LGD, which are estimated based on changes in the Firm's credit spread observed in the bond market. Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue. Unrealized (gains)/losses are reported in OCI. Refer to page 184 in this Note and Note 24 for further information.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets and liabilities held as of December 31, 2021 and 2020, for which nonrecurring fair value adjustments were recorded during the years ended December 31, 2021 and 2020, by major product category and fair value hierarchy.

December 31, 2021 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 1,006	$ 856 [b]	$ 1,862
Other assets[a]	–	4	1,612	1,616
Total assets measured at fair value on a nonrecurring basis	**$ –**	**$ 1,010**	**$ 2,468**	**$ 3,478**
Accounts payable and other liabilities	–	–	3	3
Total liabilities measured at fair value on a nonrecurring basis	**$ –**	**$ –**	**$ 3**	**$ 3**

December 31, 2020 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 1,611	$ 972	$ 2,583
Other assets	–	5	979	984
Total assets measured at fair value on a nonrecurring basis	$ –	$ 1,616	$ 1,951	$ 3,567
Accounts payable and other liabilities	–	–	12	12
Total liabilities measured at fair value on a nonrecurring basis	$ –	$ –	$ 12	$ 12

(a) Primarily includes equity securities without readily determinable fair values that were adjusted based on observable price changes in orderly transactions from an identical or similar investment of the same issuer (measurement alternative). Of the $1.6 billion in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2021, $1.5 billion related to equity securities adjusted based on the measurement alternative. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.

(b) Of the $856 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2021, $254 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans). These amounts are classified as level 3 as they are valued using information from broker's price opinions, appraisals and automated valuation models and discounted based upon the Firm's experience with actual liquidation values. These discounts ranged from 12% to 45% with a weighted average of 25%.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which fair value adjustments have been recognized for the years ended December 31, 2021, 2020 and 2019, related to assets and liabilities held at those dates.

December 31, (in millions)	2021	2020	2019
Loans	**$ (72)**	$ (393)	$ (274)
Other assets[a]	**344**	(529)	182
Accounts payable and other liabilities	**5**	(11)	–
Total nonrecurring fair value gains/(losses)	**$ 277**	$ (933)	$ (92)

(a) Included $379 million, $(134) million and $201 million for the years ended December 31, 2021, 2020 and 2019, respectively, of net gains/(losses) as a result of the measurement alternative.

Refer to Note 12 for further information about the measurement of collateral-dependent loans.

Equity securities without readily determinable fair values

The Firm measures certain equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer (i.e., measurement alternative), with such changes recognized in other income.

In its determination of the new carrying values upon observable price changes, the Firm may adjust the prices if deemed necessary to arrive at the Firm's estimated fair values. Such adjustments may include adjustments to reflect the different rights and obligations of similar securities, and other adjustments that are consistent with the Firm's valuation techniques for private equity direct investments.

The following table presents the carrying value of equity securities without readily determinable fair values held as of December 31, 2021 and 2020, that are measured under the measurement alternative and the related adjustments recorded during the periods presented for those securities with observable price changes. These securities are included in the nonrecurring fair value tables when applicable price changes are observable.

As of or for the year ended December 31, (in millions)	2021	2020
Other assets		
Carrying value[(a)]	$ **3,642**	$ 2,368
Upward carrying value changes[(b)]	**432**	167
Downward carrying value changes/impairment[(c)]	**(53)**	(301)

(a) The period-end carrying values reflect cumulative purchases and sales in addition to upward and downward carrying value changes.
(b) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2021 were $1.0 billion.
(c) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2021 were $(369) million.

Included in other assets above is the Firm's interest in approximately 40 million Visa Class B common shares, recorded at a nominal carrying value. These shares are subject to certain transfer restrictions currently and will be convertible into Visa Class A common shares upon final resolution of certain litigation matters involving Visa. The conversion rate of Visa Class B common shares into Visa Class A common shares is 1.6181 at December 31, 2021, and may be adjusted by Visa depending on developments related to the litigation matters.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. However, this table does not include other items, such as nonfinancial assets, intangible assets, certain financial instruments, and customer relationships. In the opinion of management, these items, in the aggregate, add significant value to JPMorgan Chase, but their fair value is not disclosed in this table.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2021 and 2020, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

	December 31, 2021					December 31, 2020				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	**Carrying value**	**Level 1**	**Level 2**	**Level 3**	**Total estimated fair value**	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 26.4**	**$ 26.4**	**$ –**	**$ –**	**$ 26.4**	$ 24.9	$ 24.9	$ –	$ –	$ 24.9
Deposits with banks	**714.4**	**714.4**	**–**	**–**	**714.4**	502.7	502.7	–	–	502.7
Accrued interest and accounts receivable	**102.1**	**–**	**102.0**	**0.1**	**102.1**	89.4	–	89.3	0.1	89.4
Federal funds sold and securities purchased under resale agreements	**9.0**	**–**	**9.0**	**–**	**9.0**	58.3	–	58.3	–	58.3
Securities borrowed	**124.6**	**–**	**124.6**	**–**	**124.6**	107.7	–	107.7	–	107.7
Investment securities, held-to-maturity	**363.7**	**183.3**	**179.3**	**–**	**362.6**	201.8	53.2	152.3	–	205.5
Loans, net of allowance for loan losses[(a)]	**1,002.5**	**–**	**202.1**	**821.1**	**1,023.2**	940.1	–	210.9	755.6	966.5
Other	**98.7**	**–**	**97.4**	**1.4**	**98.8**	81.8	–	80.0	1.9	81.9
Financial liabilities										
Deposits	**$ 2,451.0**	**$ –**	**$ 2,451.0**	**$ –**	**$ 2,451.0**	$ 2,129.8	$ –	$ 2,128.9	$ –	$ 2,128.9
Federal funds purchased and securities loaned or sold under repurchase agreements	**67.9**	**–**	**67.9**	**–**	**67.9**	59.5	–	59.5	–	59.5
Short-term borrowings	**33.6**	**–**	**33.6**	**–**	**33.6**	28.3	–	28.3	–	28.3
Accounts payable and other liabilities	**217.6**	**–**	**212.1**	**4.9**	**217.0**	186.6	–	181.9	4.3	186.2
Beneficial interests issued by consolidated VIEs	**10.7**	**–**	**10.8**	**–**	**10.8**	17.5	–	17.6	–	17.6
Long-term debt	**226.0**	**–**	**229.5**	**3.1**	**232.6**	204.8	–	209.2	3.2	212.4

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. Carrying value of the loan takes into account the loan's allowance for loan losses, which represents the loan's expected credit losses over its remaining expected life. The difference between the estimated fair value and carrying value of a loan is generally attributable to changes in market interest rates, including credit spreads, market liquidity premiums and other factors that affect the fair value of a loan but do not affect its carrying value.

The majority of the Firm's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2021					December 31, 2020				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	**Carrying value[(a)(b)]**	**Level 1**	**Level 2**	**Level 3**	**Total estimated fair value**	Carrying value[(a)(b)]	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 2.1**	**$ –**	**$ –**	**$ 2.9**	**$ 2.9**	$ 2.2	$ –	$ –	$ 2.1	$ 2.1

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.
(b) Includes the wholesale allowance for lending-related commitments.

The Firm does not estimate the fair value of consumer off-balance sheet lending-related commitments. In many cases, the Firm can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to page 171 of this Note for a further discussion of the valuation of lending-related commitments.

Note 3 – Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments.

The Firm has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Firm's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing agreements
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes and other hybrid instruments, which are predominantly financial instruments that contain embedded derivatives, that are issued or transacted as part of client-driven activities
- Certain long-term beneficial interests issued by CIB's consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2021, 2020 and 2019, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

	2021			2020			2019		
December 31, (in millions)	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]
Federal funds sold and securities purchased under resale agreements	**$ (112)**	**$ –**	**$ (112)**	$ 12	$ –	$ 12	$ (36)	$ –	$ (36)
Securities borrowed	**(200)**	**–**	**(200)**	143	–	143	133	–	133
Trading assets:									
Debt and equity instruments, excluding loans	**(2,171)**	**(1)** [c]	**(2,172)**	2,587 [f]	(1) [c]	2,586	2,482	(1) [c]	2,481
Loans reported as trading assets:									
Changes in instrument-specific credit risk	**353**	**–**	**353**	135	–	135	248	–	248
Other changes in fair value	**(8)**	**–**	**(8)**	(19)	–	(19)	(1)	–	(1)
Loans:									
Changes in instrument-specific credit risk	**589**	**(7)** [c]	**582**	190	7 [c]	197	475	2 [c]	477
Other changes in fair value	**(139)**	**2,056** [c]	**1,917**	470	3,239 [c]	3,709	267	1,224 [c]	1,491
Other assets	**12**	**(26)** [d]	**(14)**	103	(65) [d]	38	8	6 [d]	14
Deposits[a]	**(183)**	**–**	**(183)**	(726)	–	(726)	(1,730)	–	(1,730)
Federal funds purchased and securities loaned or sold under repurchase agreements	**69**	**–**	**69**	(6)	–	(6)	(8)	–	(8)
Short-term borrowings[a]	**(366)**	**–**	**(366)**	294	–	294	(693)	–	(693)
Trading liabilities	**7**	**–**	**7**	2	–	2	6	–	6
Other liabilities	**(17)**	**–**	**(17)**	(94)	–	(94)	(16)	–	(16)
Long-term debt[a][b]	**(980)**	4 [c][d]	**(976)**	(2,120)	(1) [c]	(2,121)	(6,173)	1 [c]	(6,172)

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected are recorded in OCI while realized gains/(losses) are recorded in principal transactions revenue. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were $(15) million and $20 million for the years ended December 31,2021 and 2020, respectively, and were not material for the year ended December 31, 2019.
(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(c) Reported in mortgage fees and related income.
(d) Reported in other income.
(e) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than certain hybrid financial instruments recorded in CIB. Refer to Note 7 for further information regarding interest income and interest expense.
(f) Prior-period amounts have been revised to conform with the current presentation.

Determination of instrument-specific credit risk for items for which the fair value option was elected

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Firm's credit spread as observed in the bond market.
- Securities financing agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2021 and 2020, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2021			2020		
December 31, (in millions)	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/ (under) contractual principal outstanding
Loans						
Nonaccrual loans						
Loans reported as trading assets	$ 3,263	$ 546	$ (2,717)	$ 3,386	$ 555	$ (2,831)
Loans	918	797	(121)	1,867	1,507	(360)
Subtotal	4,181	1,343	(2,838)	5,253	2,062	(3,191)
90 or more days past due and government guaranteed						
Loans[a]	293	281	(12)	328	317	(11)
All other performing loans[b]						
Loans reported as trading assets	8,594	7,528	(1,066)	7,917	6,439	(1,478)
Loans	57,695	57,742	47	42,022	42,650	628
Subtotal	66,289	65,270	(1,019)	49,939	49,089	(850)
Total loans	$ 70,763	$ 66,894	$ (3,869)	$ 55,520	$ 51,468	$ (4,052)
Long-term debt						
Principal-protected debt	$ 35,957 [d]	$ 33,799	$ (2,158)	$ 40,560 [d]	$ 40,526	$ (34)
Nonprincipal-protected debt[c]	NA	41,135	NA	NA	36,291	NA
Total long-term debt	NA	$ 74,934	NA	NA	$ 76,817	NA
Long-term beneficial interests						
Nonprincipal-protected debt[c]	NA	$ 12	NA	NA	$ 41	NA
Total long-term beneficial interests	NA	$ 12	NA	NA	$ 41	NA

(a) These balances are excluded from nonaccrual loans as the loans are insured and/or guaranteed by U.S. government agencies.
(b) There were no performing loans that were ninety days or more past due as of December 31, 2021 and 2020.
(c) Remaining contractual principal is not applicable to nonprincipal-protected structured notes and long-term beneficial interests. Unlike principal-protected structured notes and long-term beneficial interests, for which the Firm is obligated to return a stated amount of principal at maturity, nonprincipal-protected structured notes and long-term beneficial interests do not obligate the Firm to return a stated amount of principal at maturity, but for structured notes to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Firm as issuer for both nonprincipal-protected and principal-protected notes.
(d) Where the Firm issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Firm's next call date.

At December 31, 2021 and 2020, the contractual amount of lending-related commitments for which the fair value option was elected was $11.9 billion and $18.1 billion, respectively, with a corresponding fair value of $10 million and $(39) million, respectively. Refer to Note 28 for further information regarding off-balance sheet lending-related financial instruments.

Structured note products by balance sheet classification and risk component

The following table presents the fair value of structured notes, by balance sheet classification and the primary risk type.

	December 31, 2021				December 31, 2020			
(in millions)	Long-term debt	Short-term borrowings	Deposits	Total	Long-term debt	Short-term borrowings	Deposits	Total
Risk exposure								
Interest rate	**$ 34,127**	**$ 1**	**$ 4,860**	**$ 38,988**	$ 38,129	$ 65	$ 5,057	$ 43,251
Credit	**6,352**	**858**	**—**	**7,210**	6,409	1,022	—	7,431
Foreign exchange	**3,386**	**315**	**1,066**	**4,767**	3,613	92	—	3,705
Equity	**29,317**	**6,827**	**5,125**	**41,269**	26,943	5,021	6,893	38,857
Commodity	**405**	**—**	**3** (a)	**408**	250	13	232 (a)	495
Total structured notes	**$ 73,587**	**$ 8,001**	**$ 11,054**	**$ 92,642**	$ 75,344	$ 6,213	$ 12,182	$ 93,739

(a) Excludes deposits linked to precious metals for which the fair value option has not been elected of $692 million and $739 million for the years ended December 31, 2021 and 2020, respectively.

Note 4 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

JPMorgan Chase regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Firm's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Firm's risk appetite.

In the Firm's consumer portfolio, concentrations are managed primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. Refer to Note 12 for additional information on the geographic composition of the Firm's consumer loan portfolios. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis.

The Firm's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. Refer to Note 12 for additional information on loans.

The Firm does not believe that its exposure to any particular loan product or industry segment results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Firm's assessment when extending credit and establishing its allowance for loan losses.

The table below presents both on-balance sheet and off-balance sheet consumer and wholesale credit exposure by the Firm's three credit portfolio segments as of December 31, 2021 and 2020. The wholesale industry of risk category is generally based on the client or counterparty's primary business activity.

	2021				2020			
		On-balance sheet				On-balance sheet		
December 31, (in millions)	Credit exposure[h]	Loans	Derivatives	Off-balance sheet[j]	Credit exposure[h]	Loans	Derivatives	Off-balance sheet[j]
Consumer, excluding credit card	**$ 368,640**	**$ 323,306** [i]	**$ –**	**$ 45,334**	$ 375,898	$ 318,579 [i]	$ –	$ 57,319
Credit card[a]	**884,830**	**154,296**	**–**	**730,534**	802,722	144,216	–	658,506
Total consumer[a]	**1,253,470**	**477,602**	**–**	**775,868**	1,178,620	462,795	–	715,825
Wholesale[b]								
Real Estate	**155,069**	**119,753**	**1,113**	**34,203**	148,498	118,299	1,385	28,814
Individuals and Individual Entities[c]	**141,973**	**130,576**	**1,317**	**10,080**	122,870	109,746	1,750	11,374
Consumer & Retail	**122,789**	**39,588**	**2,669**	**80,532**	108,437	39,013	2,802	66,622
Technology, Media & Telecommunications	**84,070**	**17,815**	**2,640**	**63,615**	72,150	14,687	4,252	53,211
Asset Managers	**81,228**	**41,031**	**9,351**	**30,846**	66,573	31,059	9,277	26,237
Industrials	**66,974**	**21,652**	**1,224**	**44,098**	66,470	21,143	1,851	43,476
Healthcare	**59,014**	**18,587**	**2,575**	**37,852**	60,118	19,405	3,252	37,461
Banks & Finance Cos	**54,684**	**34,217**	**4,418**	**16,049**	54,032	31,004	8,044	14,984
Oil & Gas	**42,606**	**11,039**	**6,034**	**25,533**	39,159	11,267	1,643	26,249
Automotive	**34,573**	**11,759**	**720**	**22,094**	43,331	17,128	5,995	20,208
State & Municipal Govt[d]	**33,216**	**15,322**	**1,563**	**16,331**	38,286	18,054	2,347	17,885
Utilities	**33,203**	**5,969**	**3,736**	**23,498**	30,124	4,874	3,340	21,910
Chemicals & Plastics	**17,660**	**5,033**	**564**	**12,063**	17,176	4,884	856	11,436
Metals & Mining	**16,696**	**5,696**	**924**	**10,076**	15,542	4,854	882	9,806
Transportation	**14,635**	**5,453**	**782**	**8,400**	16,232	6,566	1,495	8,171
Insurance	**13,926**	**1,303**	**2,700**	**9,923**	13,141	1,042	2,527	9,572
Central Govt	**11,317**	**2,889**	**6,837**	**1,591**	17,025	3,396	12,313	1,316
Financial Markets Infrastructure	**4,377**	**5**	**2,487**	**1,885**	6,515	19	3,757	2,739
Securities Firms	**4,180**	**469**	**1,260**	**2,451**	8,048	469	4,838	2,741
All other[e]	**111,690**	**72,198**	**4,167**	**35,325**	96,527	58,038	2,838 [k]	35,651
Subtotal	**1,103,880**	**560,354**	**57,081**	**486,445**	1,040,254	514,947	75,444	449,863
Loans held-for-sale and loans at fair value	**39,758**	**39,758**	**–**	**–**	35,111	35,111	–	–
Receivables from customers[f]	**59,645**	**–**	**–**	**–**	47,710	–	–	–
Total wholesale	**1,203,283**	**600,112**	**57,081**	**486,445**	1,123,075	550,058	75,444	449,863
Total exposure[g][h]	**$ 2,456,753**	**$ 1,077,714**	**$ 57,081**	**$ 1,262,313**	$ 2,301,695	$ 1,012,853	$ 75,444	$ 1,165,688

(a) Also includes commercial card lending-related commitments primarily in CB and CIB.
(b) The industry rankings presented in the table as of December 31, 2020, are based on the industry rankings of the corresponding exposures at December 31, 2021, not actual rankings of such exposures at December 31, 2020.
(c) Individuals and Individual Entities predominantly consists of Global Private Bank clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.
(d) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2021 and 2020, noted above, the Firm held: $7.1 billion and $7.2 billion, respectively, of trading assets; $15.9 billion and $20.4 billion, respectively, of AFS securities; and $14.0 billion and $12.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.
(e) All other includes: SPEs and Private education and civic organizations, representing approximately 94% and 6%, respectively, at December 31, 2021 and 92% and 8%, respectively, at December 31, 2020 . Refer to Note 14 for more information on exposures to SPEs.
(f) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.
(g) Excludes cash placed with banks of $729.6 billion and $516.9 billion, at December 31, 2021 and 2020, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
(h) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
(i) At December 31, 2021 and 2020, included $5.4 billion and $19.2 billion of loans in Business Banking under the PPP, respectively. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.
(j) Represents lending-related financial instruments.
(k) Prior-period amounts have been revised to conform with the current presentation.

Note 5 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. JPMorgan Chase makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Firm's derivatives are entered into for market-making or risk management purposes.

Market-making derivatives
The majority of the Firm's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Firm actively manages the risks from its exposure to these derivatives by entering into other derivative contracts or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives
The Firm manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

The Firm generally uses interest rate derivatives to manage the risk associated with changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increase or decrease as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains and losses on the derivative instruments related to these assets and liabilities are expected to substantially offset this variability.

Foreign currency derivatives are used to manage the foreign exchange risk associated with certain foreign currency–denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar–equivalent values of the foreign currency–denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency–denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities derivatives are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. Refer to the Credit derivatives section on pages 207-210 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 207 of this Note, and the hedge accounting gains and losses tables on pages 204-206 of this Note for more information about risk management derivatives.

Derivative counterparties and settlement types
The Firm enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Firm also enters into, as principal, certain ETD such as futures and options, and OTC-cleared derivative contracts with CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Firm's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services
The Firm provides clearing services for clients in which the Firm acts as a clearing member at certain exchanges and clearing houses. The Firm does not reflect the clients' derivative contracts in its Consolidated Financial Statements. Refer to Note 28 for further information on the Firm's clearing services.

Accounting for derivatives

All free-standing derivatives that the Firm executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Firm nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Firm and the derivative counterparty. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 200-207 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. Refer to Notes 2 and 3 for a further discussion of derivatives embedded in structured notes.

Derivatives designated as hedges

The Firm applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, JPMorgan Chase does not seek to apply hedge accounting to all of the derivatives involved in the Firm's risk management activities. For example, the Firm does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Firm does not apply hedge accounting to certain interest rate, foreign exchange, and commodity derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Firm uses statistical methods such as regression analysis, nonstatistical methods such as dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item, and qualitative comparisons of critical terms and the evaluation of any changes in those terms. The extent to which a derivative has been, and is expected to continue to be, highly effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. JPMorgan Chase uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. Certain amounts excluded from the assessment of effectiveness are recorded in OCI and recognized in earnings over the life of the derivative. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

JPMorgan Chase uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency–denominated revenue and expense. For qualifying cash flow hedges, changes in the fair value of the derivative are recorded in OCI and recognized in earnings as the hedged item affects earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily noninterest revenue, net interest income and compensation expense. If the hedge relationship is terminated, then the change in value of the derivative recorded in AOCI is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is expected to not occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

JPMorgan Chase uses net investment hedges to protect the value of the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For qualifying net investment hedges, changes in the fair value of the derivatives due to changes in spot foreign exchange rates are recorded in OCI as translation adjustments. Amounts excluded from the assessment of effectiveness are recorded directly in earnings.

The following table outlines the Firm's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Affected segment or unit	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:				
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	Corporate	204-205
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	Corporate	206
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	Corporate	204-205
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	Corporate	206
• Foreign exchange	Hedge the value of the Firm's investments in non-U.S. dollar functional currency entities	Net investment hedge	Corporate	206
• Commodity	Hedge commodity inventory	Fair value hedge	CIB, AWM	204-205
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:				
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	CCB	207
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	CIB	207
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	Corporate	207
Market-making derivatives and other activities:				
• Various	Market-making and related risk management	Market-making and other	CIB	207
• Various	Other derivatives	Market-making and other	CIB, AWM, Corporate	207

Notional amount of derivative contracts

The following table summarizes the notional amount of free-standing derivative contracts outstanding as of December 31, 2021 and 2020.

	Notional amounts[b]		
December 31, (in billions)	**2021**	2020	
Interest rate contracts			
Swaps	**$ 24,075**	$ 20,990	(c)
Futures and forwards	**2,520**	3,057	
Written options	**3,018**	3,375	
Purchased options	**3,188**	3,675	
Total interest rate contracts	**32,801**	31,097	
Credit derivatives[a]	**1,053**	1,197	(c)
Foreign exchange contracts			
Cross-currency swaps	**4,112**	3,924	
Spot, futures and forwards	**7,679**	6,871	
Written options	**741**	830	
Purchased options	**727**	825	
Total foreign exchange contracts	**13,259**	12,450	
Equity contracts			
Swaps	**612**	448	
Futures and forwards	**139**	140	
Written options	**654**	668	(c)
Purchased options	**598**	610	(c)
Total equity contracts	**2,003**	1,866	
Commodity contracts			
Swaps	**185**	138	
Spot, futures and forwards	**188**	198	
Written options	**135**	124	
Purchased options	**111**	105	
Total commodity contracts	**619**	565	
Total derivative notional amounts	**$ 49,735**	$ 47,175	

(a) Refer to the Credit derivatives discussion on pages 207-210 for more information on volumes and types of credit derivative contracts.
(b) Represents the sum of gross long and gross short third-party notional derivative contracts.
(c) Prior-period amounts have been revised to conform with the current presentation.

While the notional amounts disclosed above give an indication of the volume of the Firm's derivatives activity, the notional amounts significantly exceed, in the Firm's view, the possible losses that could arise from such transactions. For most derivative contracts, the notional amount is not exchanged; it is simply a reference amount used to calculate payments.

Impact of derivatives on the Consolidated balance sheets

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Firm's Consolidated balance sheets as of December 31, 2021 and 2020, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Free-standing derivative receivables and payables[(a)]

	Gross derivative receivables				Gross derivative payables			
December 31, 2021 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 270,562**	**$ 23**	**$ 270,585**	**$ 21,974**	**$ 240,731**	**$ —**	**$ 240,731**	**$ 8,194**
Credit	**9,839**	**—**	**9,839**	**1,031**	**10,912**	**—**	**10,912**	**880**
Foreign exchange	**169,186**	**393**	**169,579**	**12,625**	**174,622**	**1,124**	**175,746**	**14,097**
Equity	**68,631**	**—**	**68,631**	**9,981**	**79,727**	**—**	**79,727**	**17,233**
Commodity	**21,233**	**5,420**	**26,653**	**11,470**	**20,837**	**7,091**	**27,928**	**9,712**
Total fair value of trading assets and liabilities	**$ 539,451**	**$ 5,836**	**$ 545,287**	**$ 57,081**	**$ 526,829**	**$ 8,215**	**$ 535,044**	**$ 50,116**

	Gross derivative receivables				Gross derivative payables			
December 31, 2020 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 390,817 [(c)]	$ 831	$ 391,648	$ 35,725	$ 353,987 [(c)]	$ —	$ 353,987	$ 13,012
Credit	13,345 [(c)]	—	13,345	680	14,832 [(c)]	—	14,832	1,995
Foreign exchange	205,359	901	206,260	15,781	214,229	1,697	215,926	21,433
Equity	70,612 [(c)]	—	70,612	16,487 [(c)]	81,413	—	81,413	25,898
Commodity	20,579	924	21,503	6,771	20,834	1,895	22,729	8,285
Total fair value of trading assets and liabilities	$ 700,712	$ 2,656	$ 703,368	$ 75,444	$ 685,295	$ 3,592	$ 688,887	$ 70,623

(a) Balances exclude structured notes for which the fair value option has been elected. Refer to Note 3 for further information.
(b) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.
(c) Prior-period amounts have been revised to conform with the current presentation.

Derivatives netting

The following tables present, as of December 31, 2021 and 2020, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Firm has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Firm receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Firm's derivative instruments, but are not eligible for net presentation:

- collateral that consists of liquid securities and other cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount. For the purpose of this disclosure, the definition of liquid securities is consistent with the definition of high quality liquid assets as defined in the LCR rule;
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

	2021			2020		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	**$ 251,953**	**$ (234,283)**	**$ 17,670**	$ 367,214 [e]	$ (337,609) [e]	$ 29,605
OTC-cleared	**14,144**	**(13,839)**	**305**	18,340	(17,919)	421
Exchange-traded[a]	**498**	**(489)**	**9**	554	(395)	159
Total interest rate contracts	**266,595**	**(248,611)**	**17,984**	386,108	(355,923)	30,185
Credit contracts:						
OTC	**8,035**	**(7,177)**	**858**	8,894 [e]	(8,356) [e]	538
OTC-cleared	**1,671**	**(1,631)**	**40**	4,326	(4,309)	17
Total credit contracts	**9,706**	**(8,808)**	**898**	13,220	(12,665)	555
Foreign exchange contracts:						
OTC	**166,185**	**(156,251)**	**9,934**	201,349	(189,655)	11,694
OTC-cleared	**789**	**(703)**	**86**	834	(819)	15
Exchange-traded[a]	**6**	**—**	**6**	35	(5)	30
Total foreign exchange contracts	**166,980**	**(156,954)**	**10,026**	202,218	(190,479)	11,739
Equity contracts:						
OTC	**25,704**	**(23,977)**	**1,727**	29,844 [e]	(27,374)	2,470
Exchange-traded[a]	**36,095**	**(34,673)**	**1,422**	28,294	(26,751)	1,543
Total equity contracts	**61,799**	**(58,650)**	**3,149**	58,138	(54,125)	4,013
Commodity contracts:						
OTC	**15,063**	**(6,868)**	**8,195**	10,924	(7,901)	3,023
OTC-cleared	**49**	**(49)**	**—**	20	(20)	—
Exchange-traded[a]	**8,279**	**(8,266)**	**13**	6,833	(6,811)	22
Total commodity contracts	**23,391**	**(15,183)**	**8,208**	17,777	(14,732)	3,045
Derivative receivables with appropriate legal opinion	**528,471**	**(488,206)**	**40,265** [d]	677,461	(627,924)	49,537 [d]
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	**16,816**		**16,816**	25,907		25,907
Total derivative receivables recognized on the Consolidated balance sheets	**$ 545,287**		**$ 57,081**	$ 703,368		$ 75,444
Collateral not nettable on the Consolidated balance sheets[b][c]			**(10,102)**			(14,806)
Net amounts			**$ 46,979**			$ 60,638

December 31, (in millions)	2021 Gross derivative payables	2021 Amounts netted on the Consolidated balance sheets	2021 Net derivative payables	2020 Gross derivative payables	2020 Amounts netted on the Consolidated balance sheets	2020 Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 223,576**	**$ (216,757)**	**$ 6,819**	$ 332,214 [e]	$ (321,140) [e]	$ 11,074
OTC-cleared	**15,695**	**(15,492)**	**203**	19,710	(19,494)	216
Exchange-traded[a]	**292**	**(288)**	**4**	358	(341)	17
Total interest rate contracts	**239,563**	**(232,537)**	**7,026**	352,282	(340,975)	11,307
Credit contracts:						
OTC	**9,021**	**(8,421)**	**600**	10,311 [e]	(8,781) [e]	1,530
OTC-cleared	**1,679**	**(1,611)**	**68**	4,075	(4,056)	19
Total credit contracts	**10,700**	**(10,032)**	**668**	14,386	(12,837)	1,549
Foreign exchange contracts:						
OTC	**171,610**	**(160,946)**	**10,664**	210,803	(193,672)	17,131
OTC-cleared	**706**	**(703)**	**3**	836	(819)	17
Exchange-traded[a]	**7**	**—**	**7**	34	(2)	32
Total foreign exchange contracts	**172,323**	**(161,649)**	**10,674**	211,673	(194,493)	17,180
Equity contracts:						
OTC	**31,379**	**(27,830)**	**3,549**	35,330	(28,763)	6,567
Exchange-traded[a]	**40,621**	**(34,664)**	**5,957**	34,491	(26,752)	7,739
Total equity contracts	**72,000**	**(62,494)**	**9,506**	69,821	(55,515)	14,306
Commodity contracts:						
OTC	**14,874**	**(9,667)**	**5,207**	10,365	(7,544)	2,821
OTC-cleared	**73**	**(73)**	**—**	32	(32)	—
Exchange-traded[a]	**8,954**	**(8,476)**	**478**	7,391	(6,868)	523
Total commodity contracts	**23,901**	**(18,216)**	**5,685**	17,788	(14,444)	3,344
Derivative payables with appropriate legal opinion	**518,487**	**(484,928)**	**33,559** [d]	665,950	(618,264)	47,686 [d]
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**16,557**		**16,557**	22,937		22,937
Total derivative payables recognized on the Consolidated balance sheets	**$ 535,044**		**$ 50,116**	$ 688,887		$ 70,623
Collateral not nettable on the Consolidated balance sheets[b][c]			**(5,872)**			(11,964)
Net amounts			**$ 44,244**			$ 58,659

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Includes liquid securities and other cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.

(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.

(d) Net derivatives receivable included cash collateral netted of $67.6 billion and $88.0 billion at December 31, 2021 and 2020, respectively. Net derivatives payable included cash collateral netted of $64.3 billion and $78.4 billion at December 31, 2021 and 2020, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

(e) Prior-period amounts have been revised to conform with the current presentation.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose JPMorgan Chase to credit risk — the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Firm proves to be of insufficient value to cover the payment obligation. It is the policy of JPMorgan Chase to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk inherent in derivative receivables.

While derivative receivables expose the Firm to credit risk, derivative payables expose the Firm to liquidity risk, as the derivative contracts typically require the Firm to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in the Firm's and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Firm or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Firm has posted in the normal course of business, at December 31, 2021 and 2020.

OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	**2021**	2020
Aggregate fair value of net derivative payables	**$ 20,114**	$ 26,945 [(a)]
Collateral posted	**19,402**	26,289

(a) Prior-period amount has been revised to conform with the current presentation.

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of JPMorgan Chase & Co. and its subsidiaries, predominantly JPMorgan Chase Bank, N.A., at December 31, 2021 and 2020, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined rating threshold is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payment requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

	2021		2020	
December 31, (in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 219**	**$ 1,577**	$ 119	$ 1,243
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**98**	**787**	153	1,682 [(c)]

(a) Includes the additional collateral to be posted for initial margin.
(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.
(c) Prior-period amount has been revised to conform with the current presentation.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Firm enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Firm generally accounts for such transfers as collateralized financing transactions as described in Note 11, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. The amount of such transfers accounted for as a sale where the associated derivative was outstanding was not material at both December 31, 2021 and 2020.

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2021, 2020 and 2019, respectively. The Firm includes gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the related hedged item.

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2021 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	**$ (4,323)**	**$ 6,363**	**$ 2,040**	**$ –**	**$ 2,159**	**$ –**
Foreign exchange[c]	**(1,317)**	**1,349**	**32**	**(286)**	**32**	**(26)**
Commodity[d]	**(9,609)**	**9,710**	**101**	**–**	**72**	**–**
Total	**$ (15,249)**	**$ 17,422**	**$ 2,173**	**$ (286)**	**$ 2,263**	**$ (26)**

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2020 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 2,962	$ (1,889)	$ 1,073	$ –	$ 1,093	$ –
Foreign exchange[c]	793	(619)	174	(457)	174	25
Commodity[d]	(2,507)	2,650	143	–	137	–
Total	$ 1,248	$ 142	$ 1,390	$ (457)	$ 1,404	$ 25

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2019 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 3,204	$ (2,373)	$ 831	$ –	$ 828	$ –
Foreign exchange[c]	154	328	482	(866)	482	39
Commodity[d]	(77)	148	71	–	63	–
Total	$ 3,281	$ (1,897)	$ 1,384	$ (866)	$ 1,373	$ 39

(a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate (“LIBOR”), Secured Overnight Financing Rate (“SOFR”)) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.

(b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components. Also excludes the accrual of interest on interest rate swaps and the related hedged items.

(c) Primarily consists of hedges of the foreign currency risk of long-term debt and AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items due to changes in foreign currency rates and the income statement impact of excluded components were recorded primarily in principal transactions revenue and net interest income.

(d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.

(e) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.

(f) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

As of December 31, 2021 and 2020, the following amounts were recorded on the Consolidated balance sheets related to certain cumulative fair value hedge basis adjustments that are expected to reverse through the income statement in future periods as an adjustment to yield.

December 31, 2021 (in millions)	Carrying amount of the hedged items[a][b]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships[d]	Discontinued hedging relationships[d][e]	Total
Assets				
Investment securities - AFS	**$ 65,746** [c]	**$ 417**	**$ 661**	**$ 1,078**
Liabilities				
Long-term debt	**$ 195,642**	**$ (1,999)**	**$ 8,834**	**$ 6,835**
Beneficial interests issued by consolidated VIEs	**749**	**–**	**(1)**	**(1)**

December 31, 2020 (in millions)	Carrying amount of the hedged items[a][b]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships[d]	Discontinued hedging relationships[d][e]	Total
Assets				
Investment securities - AFS	$ 139,684 [c]	$ 3,572	$ 847	$ 4,419
Liabilities				
Long-term debt	$ 177,611	$ 3,194	$ 11,473	$ 14,667
Beneficial interests issued by consolidated VIEs	746	–	(3)	(3)

(a) Excludes physical commodities with a carrying value of $25.7 billion and $11.5 billion at December 31, 2021 and 2020, respectively, to which the Firm applies fair value hedge accounting. As a result of the application of hedge accounting, these inventories are carried at fair value, thus recognizing unrealized gains and losses in current periods. Since the Firm exits these positions at fair value, there is no incremental impact to net income in future periods.

(b) Excludes hedged items where only foreign currency risk is the designated hedged risk, as basis adjustments related to foreign currency hedges will not reverse through the income statement in future periods. At December 31, 2021 and 2020, the carrying amount excluded for AFS securities is $14.0 billion and $14.5 billion, respectively, and for long-term debt is $10.8 billion and $6.6 billion, respectively.

(c) Carrying amount represents the amortized cost, net of allowance if applicable. Refer to Note 10 for additional information.

(d) Positive amounts related to assets represent cumulative fair value hedge basis adjustments that will reduce net interest income in future periods. Positive (negative) amounts related to liabilities represent cumulative fair value hedge basis adjustments that will increase (reduce) net interest income in future periods.

(e) Represents basis adjustments existing on the balance sheet date associated with hedged items that have been de-designated from qualifying fair value hedging relationships.

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2021, 2020 and 2019, respectively. The Firm includes the gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

Year ended December 31, 2021 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	**$ 1,032**	**$ (2,370)**	**$ (3,402)**
Foreign exchange[(b)]	**190**	**67**	**(123)**
Total	**$ 1,222**	**$ (2,303)**	**$ (3,525)**

Year ended December 31, 2020 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ 570	$ 3,582	$ 3,012
Foreign exchange[(b)]	—	41	41
Total	$ 570	$ 3,623	$ 3,053

Year ended December 31, 2019 (in millions)	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ (28)	$ (3)	$ 25
Foreign exchange[(b)]	(75)	125	200
Total	$ (103)	$ 122	$ 225

(a) Primarily consists of hedges of contractually specified floating-rate (e.g., LIBOR and SOFR-indexed) assets and liabilities. Gains and losses were recorded in net interest income.

(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.

The Firm did not experience any forecasted transactions that failed to occur for the years ended 2021, 2020 and 2019.

Over the next 12 months, the Firm expects that approximately $671 million (after-tax) of net gains recorded in AOCI at December 31, 2021, related to cash flow hedges will be recognized in income. For cash flow hedges that have been terminated, the maximum length of time over which the derivative results recorded in AOCI will be recognized in earnings is approximately eight years, corresponding to the timing of the originally hedged forecasted cash flows. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately six years. The Firm's longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	**2021**		2020		2019	
	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI
Foreign exchange derivatives	**$(228)**	**$2,452**	$(122)	$(1,408)	$72	$64

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. The Firm elects to record changes in fair value of these amounts directly in other income.

(b) Excludes amounts reclassified from AOCI to income on the sale or liquidation of hedged entities. The amount reclassified for the year ended December 31, 2021 was not material. The Firm reclassified net pre-tax gains of $3 million and $18 million to other income related to the liquidation of certain legal entities during the years ended December 31, 2020 and 2019, respectively. Refer to Note 24 for further information.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from mortgage commitments, warehouse loans, MSRs, wholesale lending exposures, and foreign currency denominated assets and liabilities.

	Derivatives gains/(losses) recorded in income		
Year ended December 31, (in millions)	**2021**	2020	2019
Contract type			
Interest rate[(a)]	**$ 1,078**	$ 2,994	$ 1,491
Credit[(b)]	**(94)**	(176)	(30)
Foreign exchange[(c)]	**94**	43	(5)
Total	**$ 1,078**	$ 2,861	$ 1,456

(a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in mortgage commitments, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.

(b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Firm's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.

(c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

The Firm makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. Refer to Note 6 for information on principal transactions revenue.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Firm is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Firm actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Firm uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) in its wholesale and consumer businesses and derivatives counterparty exposures in its wholesale businesses, and to manage the credit risk arising from certain financial instruments in the Firm's market-making businesses. Following is a summary of various types of credit derivatives.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name"), broad-based index or portfolio. The Firm purchases and sells protection on both single- name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first $1 million of realized credit losses in a $10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

Credit-related notes

A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Firm sold and purchased as of December 31, 2021 and 2020. Upon a credit event, the Firm as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Firm manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased by CIB through credit-related notes primarily in its market-making businesses. In addition, the Firm obtains credit protection against certain loans in the retained consumer portfolio through the issuance of credit-related notes. Since these credit-related notes are not part of the market-making businesses they are not included in the table below.

The Firm does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Firm's view, the risks associated with such derivatives.

Total credit derivatives and credit-related notes

	Maximum payout/Notional amount			
December 31, 2021 (in millions)	Protection sold	Protection purchased with identical underlyings[c]	Net protection (sold)/ purchased[d]	Other protection purchased[e]
Credit derivatives				
Credit default swaps	**$ (443,481)**	**$ 458,180**	**$ 14,699**	**$ 2,269**
Other credit derivatives[a]	**(56,130)**	**79,586**	**23,456**	**13,435**
Total credit derivatives	**(499,611)**	**537,766**	**38,155**	**15,704**
Credit-related notes[b]	**–**	**–**	**–**	**9,437**
Total	**$ (499,611)**	**$ 537,766**	**$ 38,155**	**$ 25,141**

	Maximum payout/Notional amount			
December 31, 2020 (in millions)	Protection sold	Protection purchased with identical underlyings[c]	Net protection (sold)/ purchased[d]	Other protection purchased[e]
Credit derivatives				
Credit default swaps	$ (533,900) [f]	$ 552,021 [f]	$ 18,121	$ 2,786 [f]
Other credit derivatives[a]	(40,084)	57,344	17,260	10,630 [f]
Total credit derivatives	(573,984)	609,365	35,381	13,416
Credit-related notes[b]	–	–	–	10,248
Total	$ (573,984)	$ 609,365	$ 35,381	$ 23,664

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.
(b) Represents Other protection purchased by CIB, primarily in its market-making businesses.
(c) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(d) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(e) Represents protection purchased by the Firm on referenced instruments (single-name, portfolio or index) where the Firm has not sold any protection on the identical reference instrument.
(f) Prior-period amounts have been revised to conform with the current presentation.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives as of December 31, 2021 and 2020, where JPMorgan Chase is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives where JPMorgan Chase is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives ratings[(a)]/maturity profile

December 31, 2021 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[(b)]	Fair value of payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	**$ (91,155)**	**$ (255,106)**	**$ (29,035)**	**$ (375,296)**	**$ 3,645**	**$ (623)**	**$ 3,022**
Noninvestment-grade	**(32,175)**	**(84,851)**	**(7,289)**	**(124,315)**	**2,630**	**(2,003)**	**627**
Total	**$ (123,330)**	**$ (339,957)**	**$ (36,324)**	**$ (499,611)**	**$ 6,275**	**$ (2,626)**	**$ 3,649**

December 31, 2020 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[(b)]	Fair value of payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (93,529) (c)	$ (306,830) (c)	$ (35,326)	$ (435,685)	$ 5,372 (c)	$ (834) (c)	$ 4,538
Noninvestment-grade	(31,809)	(97,337)	(9,153)	(138,299)	3,953	(2,542)	1,411
Total	$ (125,338)	$ (404,167)	$ (44,479)	$ (573,984)	$ 9,325	$ (3,376)	$ 5,949

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements including cash collateral netting.
(c) Prior-period amounts have been revised to conform with the current presentation.

Note 6 – Noninterest revenue and noninterest expense

Noninterest revenue

The Firm records noninterest revenue from certain contracts with customers in investment banking fees, deposit-related fees, asset management, administration, and commissions, and components of card income. The related contracts are often terminable on demand and the Firm has no remaining obligation to deliver future services. For arrangements with a fixed term, the Firm may commit to deliver services in the future. Revenue associated with these remaining performance obligations typically depends on the occurrence of future events or underlying asset values, and is not recognized until the outcome of those events or values are known.

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Firm helps clients raise capital via public offering and private placement of various types of debt and equity instruments. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Firm also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Firm also provides advisory services, by assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

The following table presents the components of investment banking fees.

Year ended December 31, (in millions)	2021	2020	2019
Underwriting			
Equity	**$ 3,969**	$ 2,759	$ 1,648
Debt	**4,853**	4,362	3,513
Total underwriting	**8,822**	7,121	5,161
Advisory	**4,394**	2,365	2,340
Total investment banking fees	**$ 13,216**	$ 9,486	$ 7,501

Investment banking fees are earned primarily by CIB. Refer to Note 32 for segment results.

Principal transactions

Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

Refer to Note 5 for further information on the income statement classification of gains and losses from derivatives activities.

In the financial commodity markets, the Firm transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Firm primarily purchases and sells precious and base metals and may hold other commodities inventories under financing and other arrangements with clients.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Firm's client-driven market-making activities in CIB and fund deployment activities in Treasury and CIO. Refer to Note 7 for further information on interest income and interest expense.

Trading revenue is presented primarily by instrument type. The Firm's client-driven market-making businesses generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of any individual LOB.

Year ended December 31, (in millions)	2021	2020	2019
Trading revenue by instrument type			
Interest rate[(a)]	**$ 1,646**	$ 2,575	$ 2,739
Credit[(b)]	**2,691**	2,753	1,628
Foreign exchange	**2,787**	4,253	3,179
Equity	**7,773**	6,171	5,589
Commodity	**1,428**	2,088	1,133
Total trading revenue	**16,325**	17,840	14,268
Private equity gains/(losses)	**(21)**	181	(250)
Principal transactions	**$ 16,304**	$ 18,021	$ 14,018

(a) Includes the impact of changes in funding valuation adjustments on derivatives.
(b) Includes the impact of changes in credit valuation adjustments on derivatives, net of the associated hedging activities.

Principal transactions revenue is earned primarily by CIB. Refer to Note 32 for segment results.

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned from providing overdraft and other deposit account services, and from performing cash management activities. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

The following table presents the components of lending- and deposit-related fees.

Year ended December 31, (in millions)	2021	2020	2019
Lending-related fees	**$ 1,472**	$ 1,271	$ 1,184
Deposit-related fees	**5,560**	5,240	5,442
Total lending- and deposit-related fees	**$ 7,032**	$ 6,511	$ 6,626

Lending- and deposit-related fees are earned by CCB, CIB, CB, and AWM. Refer to Note 32 for segment results.

Asset management, administration and commissions

This revenue category includes fees from investment management and related services, custody, brokerage services and other products. The Firm manages assets on behalf of its clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Firm also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. The Firm has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to these third-party service providers are generally recorded in professional and outside services expense.

The following table presents the components of Firmwide asset management, administration and commissions.

Year ended December 31, (in millions)	2021	2020	2019
Asset management fees			
Investment management fees[(a)]	**$ 14,027**	$ 11,694	$ 10,865
All other asset management fees[(b)]	**378**	338	315
Total asset management fees	**14,405**	12,032	11,180
Total administration fees[(c)]	**2,554**	2,249	2,197
Commissions and other fees			
Brokerage commissions[(d)]	**3,046**	2,959	2,439
All other commissions and fees	**1,024**	937	1,092
Total commissions and fees	**4,070**	3,896	3,531
Total asset management, administration and commissions	**$ 21,029**	$ 18,177	$ 16,908

(a) Represents fees earned from managing assets on behalf of the Firm's clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts.
(b) Represents fees for services that are ancillary to investment management services, such as commissions earned on the sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees based on the underlying fund's asset value and/or investor redemption, recorded over time as the investor remains in the fund or upon investor redemption.
(c) Predominantly includes fees for custody, securities lending, funds services and securities clearance. These fees are recorded as revenue over the period in which the related service is provided.
(d) Represents commissions earned when the Firm acts as a broker, by facilitating its clients' purchases and sales of securities and other financial instruments. Brokerage commissions are collected and recognized as revenue upon occurrence of the client transaction. The Firm reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.

Asset management, administration and commissions are earned primarily by AWM, CIB and CCB. Refer to Note 32 for segment results.

Mortgage fees and related income

This revenue category reflects CCB's Home Lending production and net mortgage servicing revenue.

Production revenue includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option. Net mortgage servicing revenue includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Refer to Note 15 for further information on risk management activities and MSRs.

Net interest income from mortgage loans is recorded in interest income.

Card income

This revenue category includes interchange and other income from credit and debit card transactions; and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder and presented net of certain transaction-related costs. Card income also includes account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Firm related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections. The Firm maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

Credit card revenue sharing agreements

The Firm has contractual agreements with numerous co-brand partners that grant the Firm exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Firm. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Firm will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Firm typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Firm as incurred and reported as marketing expense. Payments for partner loyalty program rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

The following table presents the components of card income:

Year ended December 31, (in millions)	**2021**	2020	2019
Interchange and merchant processing income	**$ 23,592**	$ 18,563	$ 20,370
Reward costs and partner payments	**(17,868)**	(13,637)	(14,540)
Other card income[(a)]	**(622)**	(491)	(754)
Total card income	**$ 5,102**	$ 4,435	$ 5,076

(a) Predominantly represents the amortization of account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Card income is earned primarily by CCB, CIB and CB. Refer to Note 32 for segment results.

Refer to Note 18 for information on operating lease income included within **other income**.

Noninterest expense

Other expense

Other expense on the Firm's Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2021**	2020	2019
Legal expense	**$ 426**	$ 1,115	$ 239

Note 7 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2021	2020	2019
Interest income			
Loans[(a)]	**$ 41,537**	$ 43,758	$ 51,855
Taxable securities	**6,460**	7,843	7,962
Non-taxable securities[(b)]	**1,063**	1,184	1,329
Total investment securities[(a)]	**7,523**	9,027	9,291
Trading assets - debt instruments	**6,825**	7,832	9,141
Federal funds sold and securities purchased under resale agreements	**958**	2,436	6,146
Securities borrowed[(c)]	**(385)**	(302)	1,574
Deposits with banks	**512**	749	3,887
All other interest-earning assets[(d)]	**894**	1,023	2,146
Total interest income	**$ 57,864**	$ 64,523	$ 84,040
Interest expense			
Interest bearing deposits	**$ 531**	$ 2,357	$ 8,957
Federal funds purchased and securities loaned or sold under repurchase agreements	**274**	1,058	4,630
Short-term borrowings[(e)]	**126**	372	1,248
Trading liabilities - debt and all other interest-bearing liabilities[(c)(f)]	**257**	195	2,585
Long-term debt	**4,282**	5,764	8,807
Beneficial interest issued by consolidated VIEs	**83**	214	568
Total interest expense	**$ 5,553**	$ 9,960	$ 26,795
Net interest income	**$ 52,311**	$ 54,563	$ 57,245
Provision for credit losses	**(9,256)**	17,480	5,585
Net interest income after provision for credit losses	**$ 61,567**	$ 37,083	$ 51,660

(a) Includes the amortization/accretion of unearned income (e.g., purchase premiums/discounts and net deferred fees/costs).
(b) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(c) Negative interest income is related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
(d) Includes interest earned on brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated balance sheets.
(e) Includes commercial paper.
(f) All other interest-bearing liabilities includes interest expense on brokerage-related customer payables.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are primarily reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. Refer to Notes 12, 10, 11 and 20 for further information on accounting for interest income and interest expense related to loans, investment securities, securities financing activities (i.e., securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, respectively.

Note 8 – Pension and other postretirement employee benefit plans

The Firm has various defined benefit pension plans and OPEB plans that provide benefits to its employees in the U.S. and certain non-U.S. locations. Substantially all the defined benefit pension plans are closed to new participants. The principal defined benefit pension plan in the U.S., which covered substantially all U.S. employees, was closed to new participants and frozen for existing participants on January 1, 2020, (and January 1, 2019 for new hires on or after December 2, 2017). Interest credits continue to accrue to participants' accounts based on their accumulated balances.

The Firm maintains funded and unfunded postretirement benefit plans that provide medical and life insurance for certain eligible employees and retirees as well as their dependents covered under these programs. None of these plans have a material impact on the Firm's Consolidated Financial Statements.

The Firm also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations. The most significant of these plans is the JPMorgan Chase 401(k) Savings Plan ("the 401(k) Savings Plan"), which covers substantially all U.S. employees. Employees can contribute to the 401(k) Savings Plan on a pretax and/or Roth 401(k) after-tax basis. The Firm makes an annual matching contribution as well as an annual profit-sharing contribution to the 401(k) Savings Plan on behalf of eligible participants.

The following table presents the pretax benefit obligations, plan assets, the net funded status, and the amounts recorded in AOCI on the Consolidated balance sheets for the Firm's defined benefit pension and OPEB plans.

As of or for the year ended December 31,	Defined benefit pension and OPEB plans	
(in millions)	**2021**	2020
Projected benefit obligations	**$ (18,046)**	$ (19,137)
Fair value of plan assets	**25,692**	25,417
Net funded status	**7,646**	6,280
Accumulated other comprehensive income/(loss)	**(453)**	(1,586)

The weighted-average discount rate used to value the benefit obligations as of December 31, 2021 and 2020, was 2.54% and 2.17%, respectively.

Gains and losses

Gains or losses resulting from changes in the benefit obligation and the fair value of plan assets are recorded in OCI. Amortization of net gains or losses are recognized as part of the net periodic benefit cost over subsequent periods, if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Amortization is generally over the average expected remaining lifetime of plan participants, given the frozen status of most plans. For the years ended December 31, 2021 and 2020, the net gain was predominantly attributable to a market-driven increase in the fair value of plan assets and changes in the discount rate.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for the Firm's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans.

	Pension and OPEB plans		
Year ended December 31, (in millions)	**2021**	2020	2019
Total net periodic defined benefit plan cost/(credit)	**$ (201)**	$ (285)	$ 144
Total defined contribution plans	**1,333**	1,332	952
Total pension and OPEB cost included in noninterest expense	**$ 1,132**	$ 1,047	$ 1,096
Total recognized in other comprehensive income	**$ (1,129)**	$ (214)	$ (1,157)

The following table presents the weighted-average actuarial assumptions used to determine the net periodic benefit costs for the defined benefit pension and OPEB plans.

	Defined benefit pension and OPEB plans		
Year ended December 31,	**2021**	2020	2019
Discount rate	**2.17 %**	2.93 %	3.89 %
Expected long-term rate of return on plan assets	**2.97 %**	3.91 %	5.08 %

Plan assumptions

The Firm's expected long-term rate of return is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns, with consideration given to current market conditions and the portfolio mix of each plan.

The discount rates used in determining the benefit obligations are generally provided by the Firm's actuaries, with the Firm's principal defined benefit pension plan using a rate that was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows.

Investment strategy and asset allocation

The assets of the Firm's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments. The Firm regularly reviews the asset allocations and asset managers, as well as other factors that could impact the portfolios, which are rebalanced when deemed necessary. The approved asset allocation ranges by asset class for the Firm's principal defined benefit plan are 42-100% debt securities, 0-40% equity securities, 0-3% real estate, and 0-12% alternatives as of December 31, 2021.

As of December 31, 2021, assets held by the Firm's defined benefit pension and OPEB plans do not include securities issued by JPMorgan Chase or its affiliates, except through indirect exposures through investments in exchange traded funds, mutual funds and collective investment funds managed by third-parties. The defined benefit pension and OPEB plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of $2.5 billion and $2.7 billion, as of December 31, 2021 and 2020, respectively.

Fair value measurement of the plans' assets and liabilities

Refer to Note 2 for 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 Firm.

Pension plan assets and liabilities measured at fair value

	Defined benefit pension and OPEB plans							
	2021				2020			
December 31, (in millions)	Level 1[a]	Level 2[b]	Level 3[c]	Total fair value	Level 1[a]	Level 2[b]	Level 3[c]	Total fair value
Assets measured at fair value classified in fair value hierarchy	**$ 6,541**	**$ 12,315**	**$ 3,172**	**$ 22,028**	$ 7,031	$ 12,384	$ 2,952	$ 22,367
Assets measured at fair value using NAV as practical expedient not classified in fair value hierarchy				**3,960**				3,651
Net defined benefit pension plan payables not classified in fair value hierarchy				**(296)**				(601)
Total fair value of plan assets				**$ 25,692**				$ 25,417

(a) Consists largely of equity securities.
(b) Consists largely of corporate debt securities.
(c) Consists of corporate-owned life insurance policies and participating annuity contracts.

Changes in level 3 fair value measurements using significant unobservable inputs

Investments classified in level 3 of the fair value hierarchy increased $220 million in 2021 from $3.0 billion to $3.2 billion, predominantly due to $332 million in unrealized gains, partially offset by $94 million in settlements. In 2020, there was an increase of $263 million, from $2.7 billion to $3.0 billion consisting of $343 million in unrealized gains and $33 million of transfers into level 3, partially offset by $118 million in settlements.

Estimated future benefit payments

The following table presents benefit payments expected to be paid for the defined benefit pension and OPEB plans for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension and OPEB plans
2022	$ 1,124
2023	1,106
2024	1,082
2025	1,036
2026	1,016
Years 2027–2031	4,740

Note 9 – Employee share-based incentives

Employee share-based awards

In 2021, 2020 and 2019, JPMorgan Chase granted long-term share-based awards to certain employees under its LTIP, as amended and restated effective May 15, 2018, and subsequently amended effective May 18, 2021. Under the terms of the LTIP, as of December 31, 2021, 83 million shares of common stock were available for issuance through May 2025. The LTIP is the only active plan under which the Firm is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior Firm plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute the Firm's share-based incentive plans.

RSUs are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Predominantly all RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

Performance share units ("PSUs") are granted annually, and approved by the Firm's Board of Directors, to members of the Firm's Operating Committee under the variable compensation program. PSUs are subject to the Firm's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. In addition, dividends that accrue during the vesting period are reinvested in dividend equivalent share units. PSUs and the related dividend equivalent share units are converted into shares of common stock after vesting.

Once the PSUs and dividend equivalent share units have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights ("SARs") and stock options have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. SARs and stock options generally expire ten years after the grant date. In 2021, the Firm awarded its Chairman and CEO and its President and Chief Operating Officer 1.5 million and 750,000 SARs, respectively. There were no material grants of SARs or stock options in 2020 and 2019.

The Firm separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, the Firm accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

The Firm's policy for issuing shares upon settlement of employee share-based incentive awards is to issue either new shares of common stock or treasury shares. During 2021, 2020 and 2019, the Firm settled all of its employee share-based awards by issuing treasury shares.

Refer to Note 23 for further information on the classification of share-based awards for purposes of calculating earnings per share.

RSUs, PSUs, SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase's RSUs, PSUs, SARs and stock options activity for 2021.

Year ended December 31, 2021 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs Number of units	RSUs/PSUs Weighted-average grant date fair value	SARs/Options Number of awards	SARs/Options Weighted-average exercise price	SARs/Options Weighted-average remaining contractual life (in years)	SARs/Options Aggregate intrinsic value
Outstanding, January 1	**47,510**	**$ 112.85**	**3,124**	**$ 41.25**		
Granted	**20,347**	**138.98**	**2,250**	**152.19**		
Exercised or vested	**(20,235)**	**107.26**	**(2,005)**	**39.08**		
Forfeited	**(2,217)**	**126.77**	**—**	**—**		
Canceled	**NA**	**NA**	**—**	**—**		
Outstanding, December 31	**45,405**	**$ 126.32**	**3,369**	**$ 116.62**	**6.8**	**$ 141,872**
Exercisable, December 31	**NA**	**NA**	**1,119**	**45.14**	**0.9**	**127,030**

The total fair value of RSUs that vested during the years ended December 31, 2021, 2020 and 2019, was $2.9 billion, $2.8 billion and $2.9 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2021, 2020 and 2019, was $232 million, $182 million and $503 million, respectively.

Compensation expense

The Firm recognized the following noncash compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	**2021**	2020	2019
Cost of prior grants of RSUs, PSUs, SARs and stock options that are amortized over their applicable vesting periods	**$ 1,161**	$ 1,101	$ 1,141
Accrual of estimated costs of share-based awards to be granted in future periods, predominantly those to full-career eligible employees	**1,768**	1,350	1,115
Total noncash compensation expense related to employee share-based incentive plans	**$ 2,929**	$ 2,451	$ 2,256

At December 31, 2021, approximately $862 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.8 years. The Firm does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

Income tax benefits (including tax benefits from dividends or dividend equivalents) related to share-based incentive arrangements recognized in the Firm's Consolidated statements of income for the years ended December 31, 2021, 2020 and 2019, were $957 million, $837 million and $895 million, respectively.

Note 10 – Investment securities

Investment securities consist of debt securities that are classified as AFS or HTM. Debt securities classified as trading assets are discussed in Note 2. Predominantly all of the Firm's AFS and HTM securities are held by Treasury and CIO in connection with its asset-liability management activities.

AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments or allowance for credit losses, are reported in AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in investment securities gains/(losses) on the Consolidated statements of income. HTM securities, which the Firm has the intent and ability to hold until maturity, are carried at amortized cost, net of allowance for credit losses, on the Consolidated balance sheets.

For both AFS and HTM securities, purchase discounts or premiums are generally amortized into interest income on a level-yield basis over the contractual life of the security. However, premiums on certain callable debt securities are amortized to the earliest call date.

During the second quarter of 2021, the Firm transferred $104.5 billion of investment securities from AFS to HTM for capital management purposes. AOCI included pretax unrealized gains of $425 million on the securities at the date of transfer.

Unrealized gains or losses at the date of transfer of these securities continue to be reported in AOCI and are amortized into interest income on a level-yield basis over the remaining life of the securities. This amortization will offset the effect on interest income of the amortization of the premium or discount resulting from the transfer recorded at fair value.

Transfers of securities from AFS to HTM are non-cash transactions and are recorded at fair value.

The amortized costs and estimated fair values of the investment securities portfolio were as follows for the dates indicated.

	2021				2020			
December 31, (in millions)	Amortized cost[b][c]	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost[b][c]	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale securities								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**$ 72,800**	**$ 736**	**$ 993**	**$ 72,543**	$ 110,979	$ 2,372	$ 50	$ 113,301
Residential:								
U.S.	**2,128**	**38**	**2**	**2,164**	6,246	224	3	6,467
Non-U.S.	**3,882**	**25**	**1**	**3,906**	3,751	20	5	3,766
Commercial	**4,944**	**22**	**17**	**4,949**	2,819	71	34	2,856
Total mortgage-backed securities	**83,754**	**821**	**1,013**	**83,562**	123,795	2,687	92	126,390
U.S. Treasury and government agencies	**178,038**	**668**	**1,243**	**177,463**	199,910	2,141	100	201,951
Obligations of U.S. states and municipalities	**14,890**	**972**	**2**	**15,860**	18,993	1,404	1	20,396
Non-U.S. government debt securities	**16,163**	**92**	**46**	**16,209**	22,587	354	13	22,928
Corporate debt securities	**332**	**8**	**19**	**321**	215	4	3	216
Asset-backed securities:								
Collateralized loan obligations	**9,674**	**6**	**18**	**9,662**	10,055	24	31	10,048
Other	**5,403**	**47**	**2**	**5,448**	6,174	91	16	6,249
Total available-for-sale securities	**308,254**	**2,614**	**2,343**	**308,525**	381,729	6,705	256	388,178
Held-to-maturity securities[a]								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**102,556**	**1,400**	**853**	**103,103**	107,889	2,968	29	110,828
U.S. Residential	**7,316**	**1**	**106**	**7,211**	4,345	8	30	4,323
Commercial	**3,730**	**11**	**54**	**3,687**	2,602	77	–	2,679
Total mortgage-backed securities	**113,602**	**1,412**	**1,013**	**114,001**	114,836	3,053	59	117,830
U.S. Treasury and government agencies	**185,204**	**169**	**2,103**	**183,270**	53,184	50	–	53,234
Obligations of U.S. states and municipalities	**13,985**	**453**	**44**	**14,394**	12,751	519	–	13,270
Asset-backed securities:								
Collateralized loan obligations	**48,869**	**75**	**22**	**48,922**	21,050	90	2	21,138
Other	**2,047**	**1**	**7**	**2,041**	–	–	–	–
Total held-to-maturity securities	**363,707**	**2,110**	**3,189**	**362,628**	201,821	3,712	61	205,472
Total investment securities, net of allowance for credit losses	**$ 671,961**	**$ 4,724**	**$ 5,532**	**$ 671,153**	$ 583,550	$ 10,417	$ 317	$ 593,650

(a) The Firm purchased $111.8 billion, $12.4 billion and $13.4 billion of HTM securities for the years ended December 31, 2021, 2020 and 2019, respectively.

(b) The amortized cost of investment securities is reported net of allowance for credit losses of $42 million and $78 million at December 31, 2021 and 2020, respectively.

(c) Excludes $1.9 billion and $2.1 billion of accrued interest receivables at December 31, 2021 and 2020, respectively, included in accrued interest and accounts receivables on the Consolidated balance sheets. The Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income. The Firm did not reverse through interest income any accrued interest receivables for the years ended December 31, 2021 and 2020.

At December 31, 2021, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Risk ratings are used to identify the credit quality of securities and differentiate risk within the portfolio. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., probability of default ("PD") and loss given default ("LGD")) may differ as they reflect internal historical experiences and assumptions. Risk ratings are assigned at acquisition, reviewed on a regular and ongoing basis by Credit Risk Management and adjusted as necessary over the life of the investment for updated information affecting the issuer's ability to fulfill its obligations.

AFS securities impairment

The following tables present the fair value and gross unrealized losses by aging category for AFS securities at December 31, 2021 and 2020. The tables exclude U.S. Treasury and government agency securities and U.S. GSE and government agency MBS with unrealized losses of $2.2 billion and $150 million, at December 31, 2021 and 2020, respectively; changes in the value of these securities are generally driven by changes in interest rates rather than changes in their credit profile given the explicit or implicit guarantees provided by the U.S. government.

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2021 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	**$ 303**	**$ 1**	**$ 45**	**$ 1**	**$ 348**	**$ 2**
Non-U.S.	**133**	**1**	**—**	**—**	**133**	**1**
Commercial	**2,557**	**5**	**349**	**12**	**2,906**	**17**
Total mortgage-backed securities	**2,993**	**7**	**394**	**13**	**3,387**	**20**
Obligations of U.S. states and municipalities	**120**	**2**	**—**	**—**	**120**	**2**
Non-U.S. government debt securities	**5,060**	**37**	**510**	**9**	**5,570**	**46**
Corporate debt securities	**166**	**1**	**46**	**18**	**212**	**19**
Asset-backed securities:						
Collateralized loan obligations	**8,110**	**18**	**208**	**—**	**8,318**	**18**
Other	**89**	**—**	**178**	**2**	**267**	**2**
Total available-for-sale securities with gross unrealized losses	**$ 16,538**	**$ 65**	**$ 1,336**	**$ 42**	**$ 17,874**	**$ 107**

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2020 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	$ 562	$ 3	$ 32	$ —	$ 594	$ 3
Non-U.S.	2,507	4	235	1	2,742	5
Commercial	699	18	124	16	823	34
Total mortgage-backed securities	3,768	25	391	17	4,159	42
Obligations of U.S. states and municipalities	49	1	—	—	49	1
Non-U.S. government debt securities	2,709	9	968	4	3,677	13
Corporate debt securities	91	3	5	—	96	3
Asset-backed securities:						
Collateralized loan obligations	5,248	18	2,645	13	7,893	31
Other	268	1	685	15	953	16
Total available-for-sale securities with gross unrealized losses	$ 12,133	$ 57	$ 4,694	$ 49	$ 16,827	$ 106

AFS securities are considered impaired if the fair value is less than the amortized cost.

The Firm recognizes impairment losses in earnings if the Firm has the intent to sell the debt security, or if it is more likely than not that the Firm will be required to sell the debt security before recovery of its amortized cost. In these circumstances the impairment loss recognized in investment securities gains/(losses) is equal to the full difference between the amortized cost (net of allowance if applicable) and the fair value of the security.

For impaired debt securities that the Firm has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. If it is determined that a credit loss exists, that loss is recognized as an allowance for credit losses through the provision for credit losses in the Consolidated Statements of Income, limited by the amount of impairment. Any impairment not due to credit losses is recorded in OCI.

Factors considered in evaluating credit losses include adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; and payment structure of the security.

When assessing securities issued in a securitization for credit losses, the Firm estimates cash flows considering relevant market and economic data, underlying loan-level data, and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists.

For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Firm would not recover substantially all of its recorded investment, the Firm evaluates impairment for credit losses when there is an adverse change in expected cash flows.

HTM securities – credit risk

Allowance for credit losses
The allowance for credit losses represents expected credit losses over the remaining expected life of HTM securities.

The allowance for credit losses on HTM obligations of U.S. states and municipalities and commercial mortgage-backed securities is calculated by applying statistical credit loss factors (estimated PD and LGD) to the amortized cost. The credit loss factors are derived using a weighted average of five internally developed eight-quarter macroeconomic scenarios, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the forecast period. Refer to Note 13 for further information on the eight-quarter macroeconomic forecast.

The allowance for credit losses on HTM collateralized loan obligations and U.S. residential mortgage-backed securities is calculated as the difference between the amortized cost and the present value of the cash flows expected to be collected, discounted at the security's effective interest rate. These cash flow estimates are developed based on expectations of underlying collateral performance derived using the eight-quarter macroeconomic forecast and the single year straight-line interpolation, as well as considering the structural features of the security.

The application of different inputs and assumptions into the calculation of the allowance for credit losses is subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses on HTM securities.

Credit quality indicator
The primary credit quality indicator for HTM securities is the risk rating assigned to each security. At both December 31, 2021 and 2020, all HTM securities were rated investment grade and were current and accruing, with approximately 98% rated at least AA+.

Allowance for credit losses on investment securities

The allowance for credit losses on investment securities was $42 million and $78 million as of December 31, 2021 and 2020, respectively. The allowance for credit losses on investment securities as of December 31, 2020 included a $10 million cumulative-effect adjustment to retained earnings upon the adoption of CECL on January 1, 2020.

Selected impacts of investment securities on the Consolidated statements of income

Year ended December 31, (in millions)	**2021**	2020	2019
Realized gains	**$ 595**	$ 3,080	$ 650
Realized losses	**(940)**	(2,278)	(392)
Investment securities gains/ (losses)	**$ (345)**	$ 802	$ 258
Provision for credit losses	**$ (36)**	$ 68	NA

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2021, of JPMorgan Chase's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2021 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[(b)]	Total
Available-for-sale securities					
Mortgage-backed securities					
Amortized cost	$ 8	$ 3,771	$ 4,823	$ 75,155	$ 83,757
Fair value	8	3,783	5,094	74,677	83,562
Average yield[(a)]	0.52 %	1.53 %	1.75 %	2.25 %	2.19 %
U.S. Treasury and government agencies					
Amortized cost	$ 7,774	$ 146,817	$ 14,618	$ 8,829	$ 178,038
Fair value	7,802	146,050	14,554	9,057	177,463
Average yield[(a)]	1.01 %	0.55 %	0.61 %	0.54 %	0.57 %
Obligations of U.S. states and municipalities					
Amortized cost	$ 13	$ 142	$ 1,285	$ 13,450	$ 14,890
Fair value	13	146	1,346	14,355	15,860
Average yield[(a)]	4.06 %	4.38 %	4.84 %	4.89 %	4.88 %
Non-U.S. government debt securities					
Amortized cost	$ 7,211	$ 5,491	$ 3,461	$ –	$ 16,163
Fair value	7,224	5,532	3,453	–	16,209
Average yield[(a)]	2.34 %	2.53 %	1.09 %	– %	2.14 %
Corporate debt securities					
Amortized cost	$ –	$ 301	$ 31	$ –	$ 332
Fair value	–	290	31	–	321
Average yield[(a)]	– %	10.03 %	1.61 %	– %	9.25 %
Asset-backed securities					
Amortized cost	$ 2,500	$ 799	$ 3,369	$ 8,409	$ 15,077
Fair value	2,500	800	3,372	8,438	15,110
Average yield[(a)]	1.35 %	1.88 %	1.25 %	1.28 %	1.32 %
Total available-for-sale securities					
Amortized cost	$ 17,506	$ 157,321	$ 27,587	$ 105,843	$ 308,257
Fair value	17,547	156,601	27,850	106,527	308,525
Average yield[(a)]	1.61 %	0.67 %	1.15 %	2.37 %	1.35 %
Held-to-maturity securities					
Mortgage-backed securities					
Amortized cost	$ –	$ 1,322	$ 11,495	$ 100,791	$ 113,608
Fair value	–	1,338	11,814	100,849	114,001
Average yield[(a)]	– %	1.76 %	2.43 %	2.83 %	2.78 %
U.S. Treasury and government agencies					
Amortized cost	$ 25,706	$ 92,845	$ 66,653	$ –	$ 185,204
Fair value	25,675	91,727	65,868	–	183,270
Average yield[(a)]	0.54 %	0.74 %	1.26 %	– %	0.90 %
Obligations of U.S. states and municipalities					
Amortized cost	$ 35	$ 76	$ 1,192	$ 12,715	$ 14,018
Fair value	35	76	1,240	13,043	14,394
Average yield[(a)]	3.72 %	2.72 %	3.74 %	3.83 %	3.82 %
Asset-backed securities					
Amortized cost	$ –	$ –	$ 13,402	$ 37,514	$ 50,916
Fair value	–	–	13,449	37,514	50,963
Average yield[(a)]	– %	– %	1.18 %	1.30 %	1.27 %
Total held-to-maturity securities					
Amortized cost	$ 25,741	$ 94,243	$ 92,742	$ 151,020	$ 363,746
Fair value	25,710	93,141	92,371	151,406	362,628
Average yield[(a)]	0.54 %	0.76 %	1.43 %	2.53 %	1.65 %

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid. However, for certain callable debt securities, the average yield is calculated to the earliest call date.

(b) Substantially all of the Firm's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately 6 years for agency residential MBS, 4 years for agency residential collateralized mortgage obligations and 3 years for nonagency residential collateralized mortgage obligations.

Note 11 – Securities financing activities

JPMorgan Chase enters into resale, repurchase, securities borrowed and securities loaned agreements (collectively, “securities financing agreements”) primarily to finance the Firm’s inventory positions, acquire securities to cover short sales, accommodate customers’ financing needs, settle other securities obligations and to deploy the Firm’s excess cash.

Securities financing agreements are treated as collateralized financings on the Firm’s Consolidated balance sheets. Where appropriate under applicable accounting guidance, securities financing agreements with the same counterparty are reported on a net basis. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. Fees received and paid in connection with securities financing agreements are recorded over the life of the agreement in interest income and interest expense on the Consolidated statements of income.

The Firm has elected the fair value option for certain securities financing agreements. Refer to Note 3 for further information regarding the fair value option. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing agreements not elected under the fair value option are measured at amortized cost. As a result of the Firm’s credit risk mitigation practices described below, the Firm did not hold any allowance for credit losses with respect to resale and securities borrowed arrangements as of December 31, 2021 and 2020.

Credit risk mitigation practices

Securities financing agreements expose the Firm primarily to credit and liquidity risk. To manage these risks, the Firm monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agencies MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale and securities borrowed agreements, the Firm is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase and securities loaned agreements, credit risk exposure arises to the extent that the value of underlying securities advanced exceeds the value of the initial cash principal received, and any collateral amounts exchanged.

Additionally, the Firm typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Firm’s policy to take possession, where possible, of the securities underlying resale and securities borrowed agreements. Refer to Note 29 for further information regarding assets pledged and collateral received in securities financing agreements.

The table below summarizes the gross and net amounts of the Firm's securities financing agreements, as of December 31, 2021 and 2020. When the Firm has obtained an appropriate legal opinion with respect to a master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Firm nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Firm exchanges securities and/or cash collateral with its counterparty to reduce the economic exposure with the counterparty, but such collateral is not eligible for net Consolidated balance sheet presentation. Where the Firm has obtained an appropriate legal opinion with respect to the counterparty master netting agreement, such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented in the table below as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below. In transactions where the Firm is acting as the lender in a securities-for-securities lending agreement and receives securities that can be pledged or sold as collateral, the Firm recognizes the securities received at fair value within other assets and the obligation to return those securities within accounts payable and other liabilities on the Consolidated balance sheets.

	2021				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[(b)]	Net amounts[(c)]
Assets					
Securities purchased under resale agreements	**$ 604,724**	**$ (343,093)**	**$ 261,631**	**$ (245,588)**	**$ 16,043**
Securities borrowed	**250,333**	**(44,262)**	**206,071**	**(154,599)**	**51,472**
Liabilities					
Securities sold under repurchase agreements	**$ 532,899**	**$ (343,093)**	**$ 189,806**	**$ (166,456)**	**$ 23,350**
Securities loaned and other[(a)]	**52,610**	**(44,262)**	**8,348**	**(8,133)**	**215**

	2020				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[(b)]	Net amounts[(c)]
Assets					
Securities purchased under resale agreements	$ 666,467	$ (370,183)	$ 296,284	$ (273,206)	$ 23,078
Securities borrowed	193,700	(33,065)	160,635	(115,219)	45,416
Liabilities					
Securities sold under repurchase agreements	$ 578,060	$ (370,183)	$ 207,877	$ (191,980)	$ 15,897
Securities loaned and other[(a)]	41,366	(33,065)	8,301	(8,257)	44

(a) Includes securities-for-securities lending agreements of $5.6 billion and $3.4 billion at December 31, 2021 and 2020, respectively, accounted for at fair value, where the Firm is acting as lender.

(b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.

(c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2021 and 2020, included $13.9 billion and $17.0 billion, respectively, of securities purchased under resale agreements; $46.4 billion and $42.1 billion, respectively, of securities borrowed; $21.6 billion and $14.5 billion, respectively, of securities sold under repurchase agreements; and $198 million and $8 million, respectively, of securities loaned and other.

The tables below present as of December 31, 2021 and 2020 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2021		2020	
December 31, (in millions)	Securities sold under repurchase agreements	Securities loaned and other	Securities sold under repurchase agreements	Securities loaned and other
Mortgage-backed securities:				
U.S. GSEs and government agencies	**$ 37,046**	**$ –**	$ 56,744	$ –
Residential - nonagency	**1,508**	**–**	1,016	–
Commercial - nonagency	**1,463**	**–**	855	–
U.S. Treasury, GSEs and government agencies	**241,578**	**358**	315,834	143
Obligations of U.S. states and municipalities	**1,916**	**7**	1,525	2
Non-U.S. government debt	**174,971**	**1,572**	157,563	1,730
Corporate debt securities	**38,180**	**1,619**	22,849	1,864
Asset-backed securities	**1,211**	**–**	694	–
Equity securities	**35,026**	**49,054**	20,980	37,627
Total	**$ 532,899**	**$ 52,610**	$ 578,060	$ 41,366

	Remaining contractual maturity of the agreements				
2021 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 195,035**	**$ 231,171**	**$ 47,201**	**$ 59,492**	**$ 532,899**
Total securities loaned and other	**50,034**	**1,701**	**–**	**875**	**52,610**

	Remaining contractual maturity of the agreements				
2020 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 238,667	$ 230,980	$ 70,777	$ 37,636	$ 578,060
Total securities loaned and other	37,887	1,647	500	1,332	41,366

Transfers not qualifying for sale accounting

At December 31, 2021 and 2020, the Firm held $440 million and $598 million, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 12 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan. The Firm accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained")
- Loans held-for-sale
- Loans at fair value

The following provides a detailed accounting discussion of the Firm's loans by category:

Loans held-for-investment

Originated or purchased loans held-for-investment, including PCD, are recorded at amortized cost, reflecting the principal amount outstanding, net of the following: unamortized deferred loan fees, costs, premiums or discounts; charge-offs; collection of cash; and foreign exchange. Credit card loans also include billed finance charges and fees.

Interest income

Interest income on performing loans held-for-investment is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan as an adjustment of yield.

The Firm classifies accrued interest on loans, including accrued but unbilled interest on credit card loans, in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. Expected losses related to accrued interest on certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm's allowance for loan losses. For other loans, the Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Nonaccrual loans

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Firm recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full.

Allowance for loan losses

The allowance for loan losses represents the estimated expected credit losses in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the amortized cost to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Firm's Consolidated statements of income. Refer to Note 13 for further information on the Firm's accounting policies for the allowance for loan losses.

Charge-offs

Consumer loans are generally charged off or charged down to the lower of the amortized cost or the net realizable value of the underlying collateral (i.e., fair value less estimated costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the FFIEC. Residential real estate loans, unmodified credit card loans and scored business banking loans are generally charged off no later than 180 days past due. Scored auto and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans are charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a TDR that are determined to be collateral-dependent.

- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off or charged down within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Firm typically does not recognize charge-offs on the government-guaranteed portion of loans.

Wholesale loans are charged off when it is highly certain that a loss has been realized. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Firm's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the lower of its amortized cost or the estimated net realizable value of the underlying collateral, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Firm utilizes a broker's price opinion, appraisal and/or an automated valuation model of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every 12 months, or more frequently depending on various market factors. As soon as practicable after the Firm receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Firm generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Firm's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Firm's policies. The Firm also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Loans held-for-sale are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Because these loans are recognized at the lower of cost or fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans held-for-sale are subject to the nonaccrual policies described above.

Loans at fair value

Loans for which the fair value option has been elected are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans at fair value are subject to the nonaccrual policies described above.

Refer to Note 3 for further information on the Firm's elections of fair value accounting under the fair value option. Refer to Note 2 and Note 3 for further information on loans carried at fair value and classified as trading assets.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at amortized cost on the date of transfer. These loans are subsequently assessed for impairment based on the Firm's allowance methodology. Refer to Note 13 for a further discussion of the methodologies used in establishing the Firm's allowance for loan losses.

Loan modifications

The Firm seeks to modify certain loans in conjunction with its loss mitigation activities. Through the modification, JPMorgan Chase grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Firm's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Firm from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment delays, principal forgiveness, or the acceptance of equity or other assets in lieu of payments. Such modifications are accounted for and reported as TDRs. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Firm has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Loans modified in TDRs are generally measured for impairment using the Firm's established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific component of the allowance throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status. Refer to Note 13 for further discussion of the methodology used to estimate the Firm's asset-specific allowance.

The Firm granted various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered TDRs because:

- they represent short-term or other insignificant modifications, whether under the Firm's regular loan modification assessments or as permitted by regulatory guidance, or
- the Firm elected to suspend TDR accounting guidance under the option provided by the CARES Act, as extended by the Consolidated Appropriations Act and which expired on January 1, 2022.

To the extent that certain modifications did not meet any of the above criteria, the Firm accounted for them as TDRs.

As permitted by regulatory guidance, the Firm did not place loans with deferrals granted due to COVID-19 on nonaccrual status where such loans were not otherwise reportable as nonaccrual. The Firm considered expected losses of principal and accrued interest associated with all COVID-19 related loan modifications in its allowance for credit losses.

Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers who would have otherwise moved into past due or nonaccrual status.

Foreclosed property

The Firm acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Firm recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Firm generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less estimated costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

Foreclosures have resumed after having been temporarily suspended in response to the COVID-19 pandemic.

Loan portfolio

The Firm's loan portfolio is divided into three portfolio segments, which are the same segments used by the Firm to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Firm monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card	Credit card	Wholesale[c][d]
• Residential real estate[a] • Auto and other[b]	• Credit card loans	• Secured by real estate • Commercial and industrial • Other[e]

(a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in CIB and Corporate.
(b) Includes scored auto and business banking loans and overdrafts.
(c) Includes loans held in CIB, CB, AWM, Corporate as well as risk-rated loans held in CCB, including business banking and auto dealer loans for which the wholesale methodology is applied when determining the allowance for loan losses.
(d) The wholesale portfolio segment's classes align with loan classifications as defined by the bank regulatory agencies, based on the loan's collateral, purpose, and type of borrower.
(e) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.

The following tables summarize the Firm's loan balances by portfolio segment.

December 31, 2021 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[a][b]
Retained	**$ 295,556**	**$ 154,296**	**$ 560,354**	**$ 1,010,206**
Held-for-sale	**1,287**	**–**	**7,401**	**8,688**
At fair value	**26,463**	**–**	**32,357**	**58,820**
Total	**$ 323,306**	**$ 154,296**	**$ 600,112**	**$ 1,077,714**

December 31, 2020 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[a][b]
Retained	$ 302,127	$ 143,432	$ 514,947	$ 960,506
Held-for-sale	1,305	784	5,784	7,873
At fair value	15,147	–	29,327	44,474
Total	$ 318,579	$ 144,216	$ 550,058	$ 1,012,853

(a) Excludes $2.7 billion and $2.9 billion of accrued interest receivables at December 31, 2021 and 2020, respectively. The Firm wrote off accrued interest receivables of $56 million and $121 million for the years ended December 31, 2021 and 2020, respectively.
(b) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2021 and 2020.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

	2021			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	**$ 515**[b][c]	**$ –**	**$ 1,122**	**$ 1,637**
Sales	**799**	**–**	**31,022**	**31,821**
Retained loans reclassified to held-for-sale[a]	**1,225**	**–**	**2,178**	**3,403**

	2020			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 3,474[b][c]	$ –	$ 1,159	$ 4,633
Sales	352	–	17,916	18,268
Retained loans reclassified to held-for-sale[a]	2,084	787	1,580	4,451

Year ended December 31, (in millions)	2019			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 1,282 [b][c]	$ –	$ 1,291	$ 2,573
Sales	30,474	–	23,445	53,919
Retained loans reclassified to held-for-sale[a]	9,188	–	2,371	11,559

(a) Reclassifications of loans to held-for-sale are non-cash transactions.

(b) Predominantly includes purchases of residential real estate loans, including the Firm's voluntary repurchases of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines for the years ended December 31, 2021, 2020 and 2019. The Firm typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, FHA, RHS, and/or VA.

(c) Excludes purchases of retained loans of $25.8 billion, $16.3 billion and $16.6 billion for the years ended December 31, 2021, 2020 and 2019, respectively, which are predominantly sourced through the correspondent origination channel and underwritten in accordance with the Firm's standards. The amount of purchases of retained loans at December 31, 2020 has been revised to conform with the current presentation.

Gains and losses on sales of loans

Net gains/(losses) on sales of loans and lending-related commitments (including adjustments to record loans and lending-related commitments held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was $261 million for the year ended December 31, 2021 of which $253 million was related to loans. Net gains/(losses) on sales of loans and lending-related commitments was $(43) million for the year ended December 31, 2020 of which $(36) million was related to loans. Net gains on sales of loans was $394 million for the year ended December 31, 2019. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

Consumer, excluding credit card loan portfolio

Consumer loans, excluding credit card loans, consist primarily of scored residential mortgages, home equity loans and lines of credit, auto and business banking loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The following table provides information about retained consumer loans, excluding credit card, by class.

December 31, (in millions)	2021	2020
Residential real estate	$ 224,795	$ 225,302
Auto and other[(a)]	70,761	76,825
Total retained loans	**$ 295,556**	$ 302,127

(a) At December 31, 2021 and 2020, included $5.4 billion and $19.2 billion of loans, respectively, in Business Banking under the PPP.

Delinquency rates are the primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely to be unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.

Residential real estate

The following tables provide information on delinquency, which is the primary credit quality indicator for retained residential real estate loans.

(in millions, except ratios)	December 31, 2021								
	Term loans by origination year[d]						Revolving loans		
	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current	$ 68,742	$ 48,334	$ 18,428	$ 7,929	$ 11,684	$ 49,147	$ 6,392	$ 11,807	$ 222,463
30–149 days past due	13	23	27	27	22	578	11	182	883
150 or more days past due	–	11	21	25	33	1,069	6	284	1,449
Total retained loans	$ 68,755	$ 48,368	$ 18,476	$ 7,981	$ 11,739	$ 50,794	$ 6,409	$ 12,273	$ 224,795
% of 30+ days past due to total retained loans[c]	0.02 %	0.07 %	0.26 %	0.65 %	0.47 %	3.18 %	0.27 %	3.80 %	1.02 %

(in millions, except ratios)	December 31, 2020								
	Term loans by origination year[d]						Revolving loans		
	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current	$ 56,576 [e]	$ 31,820	$ 13,900	$ 20,410	$ 27,978	$ 49,218 [e]	$ 7,902 [e]	$ 15,260 [e]	$223,064
30–149 days past due	9	25	20	22	29	674	21	245	1,045
150 or more days past due	3	14	10	18	18	844	22	264	1,193
Total retained loans	$ 56,588	$ 31,859	$ 13,930	$ 20,450	$ 28,025	$ 50,736	$ 7,945	$ 15,769	$225,302
% of 30+ days past due to total retained loans[c]	0.02 %	0.12 %	0.22 %	0.20 %	0.17 %	2.91 % [e]	0.54 % [e]	3.23 % [e]	0.98 %

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included $35 million and $36 million; 30–149 days past due included $11 million and $16 million; and 150 or more days past due included $20 million and $24 million at December 31, 2021 and 2020, respectively.
(b) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(c) At December 31, 2021 and 2020, residential real estate loans excluded mortgage loans insured by U.S. government agencies of $31 million and $40 million, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.
(d) Purchased loans are included in the year in which they were originated.
(e) Prior-period amounts have been revised to conform with the current presentation.

Approximately 37% of the total revolving loans are senior lien loans; the remaining balance are junior lien loans. The lien position the Firm holds is considered in the Firm's allowance for credit losses. Revolving loans that have been converted to term loans have higher delinquency rates than those that are still within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for revolving loans within the revolving period.

Nonaccrual loans and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained residential real estate loans.

(in millions, except weighted-average data)	December 31, 2021	December 31, 2020
Nonaccrual loans[(a)(b)(c)(d)]	$ 4,759	$ 5,313
90 or more days past due and government guaranteed[(e)]	24	33
Current estimated LTV ratios[(f)(g)(h)(i)]		
Greater than 125% and refreshed FICO scores:		
Equal to or greater than 660	$ 2	$ 6
Less than 660	2	12
101% to 125% and refreshed FICO scores:		
Equal to or greater than 660	37	38
Less than 660	15	44
80% to 100% and refreshed FICO scores:		
Equal to or greater than 660	2,701	2,177
Less than 660	89	239
Less than 80% and refreshed FICO scores:		
Equal to or greater than 660	209,295	208,238
Less than 660	9,658	11,980
No FICO/LTV available	2,930	2,492
U.S. government-guaranteed	66	76
Total retained loans	$ 224,795	$ 225,302
Weighted average LTV ratio[(f)(j)]	50 %	54 %
Weighted average FICO[(g)(j)]	765	763
Geographic region[(k)]		
California	$ 71,383	$ 73,444
New York	32,545	32,287
Florida	16,182	13,981
Texas	13,865	13,773
Illinois	11,565	13,130
Colorado	8,885	8,235
Washington	8,292	7,917
New Jersey	6,832	7,227
Massachusetts	6,105	5,784
Connecticut	5,242	5,024
All other[(l)]	43,899	44,500
Total retained loans	$ 224,795	$ 225,302

(a) Includes collateral-dependent residential real estate loans that are charged down to the fair value of the underlying collateral less costs to sell. The Firm reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2021, approximately 7% of Chapter 7 residential real estate loans were 30 days or more past due.

(b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.

(c) Interest income on nonaccrual loans recognized on a cash basis was $172 million and $161 million for the years ended December 31, 2021 and 2020, respectively.

(d) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 payment related deferral programs and are 90 or more days past due, predominantly all of which were considered collateral-dependent at time of exit.

(e) These balances are excluded from nonaccrual loans as the loans are guaranteed by U.S government agencies. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2021 and 2020, these balances were no longer accruing interest based on the agreed-upon servicing guidelines. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2021 and 2020.

(f) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(g) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Firm on at least a quarterly basis.

(h) At December 31, 2021 and 2020, included residential real estate loans, primarily held in LLCs in AWM that did not have a refreshed FICO score. These loans have been included in a FICO band based on management's estimation of the borrower's credit quality.

(i) Prior-period amounts have been revised to conform with the current presentation.

(j) Excludes loans with no FICO and/or LTV data available.

(k) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.

(l) At December 31, 2021 and 2020, included mortgage loans insured by U.S. government agencies of $66 million and $76 million, respectively. These amounts have been excluded from the geographic regions presented based upon the government guarantee.

Loan modifications

Modifications of residential real estate loans, where the Firm grants concessions to borrowers who are experiencing financial difficulty are generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. The carrying value of new TDRs was $866 million, $819 million and $490 million for the years ended December 31, 2021, 2020 and 2019, respectively. There were no additional commitments to lend to borrowers whose residential real estate loans have been modified in TDRs.

Nature and extent of modifications

The Firm's proprietary modification programs as well as government programs, including U.S. GSE programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and delays of principal and/or interest payments that would otherwise have been required under the terms of the original agreement. The following table provides information about how residential real estate loans were modified in TDRs under the Firm's loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act.

Year ended December 31,	**2021**	2020	2019
Number of loans approved for a trial modification	**6,246**	5,522	5,872
Number of loans permanently modified	**4,588**	6,850	4,918
Concession granted:[(a)]			
Interest rate reduction	**74 %**	50 %	77 %
Term or payment extension	**53**	49	71
Principal and/or interest deferred	**23**	14	13
Principal forgiveness	**2**	2	5
Other[(b)]	**36**	66	63

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. Concessions offered on trial modifications are generally consistent with those granted on permanent modifications.

(b) Includes variable interest rate to fixed interest rate modifications and payment delays that meet the definition of a TDR.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and do not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act.

Year ended December 31, (in millions, except weighted - average data)	**2021**	2020	2019
Weighted-average interest rate of loans with interest rate reductions – before TDR	**4.54 %**	5.09 %	5.68 %
Weighted-average interest rate of loans with interest rate reductions – after TDR	**2.92**	3.28	3.81
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	**23**	22	20
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	**38**	39	39
Charge-offs recognized upon permanent modification	**$ –**	$ 5	$ 1
Principal deferred	**28**	16	19
Principal forgiven	**1**	5	7
Balance of loans that redefaulted within one year of permanent modification[(a)]	**$ 160**	$ 199	$ 166

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it will generally be liquidated through foreclosure or another similar type of liquidation transaction. Redefaults of loans modified within the last twelve months may not be representative of ultimate redefault levels.

At December 31, 2021, the weighted-average estimated remaining lives of residential real estate loans permanently modified in TDRs were 4 years. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2021 and 2020, the Firm had residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $619 million and $846 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Auto and other

The following tables provide information on delinquency, which is the primary credit quality indicator for retained auto and other consumer loans.

	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions, except ratios)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loan delinquency[(a)]									
Current	**$ 35,323** [(c)]	**$ 18,324** [(c)]	**$ 7,443**	**$ 3,671**	**$ 1,800**	**$ 666**	**$ 2,242**	**$ 120**	**$ 69,589**
30–119 days past due	**192**	**720**	**88**	**53**	**31**	**21**	**12**	**6**	**1,123**
120 or more days past due	**–**	**35**	**–**	**–**	**1**	**1**	**5**	**7**	**49**
Total retained loans	**$ 35,515**	**$ 19,079**	**$ 7,531**	**$ 3,724**	**$ 1,832**	**$ 688**	**$ 2,259**	**$ 133**	**$ 70,761**
% of 30+ days past due to total retained loans[(b)]	**0.54 %**	**0.47 %**	**1.17 %**	**1.42 %**	**1.75 %**	**3.20 %**	**0.75 %**	**9.77 %**	**1.66 %**

	December 31, 2020								
	Term loans by origination year						Revolving loans		
(in millions, except ratios)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total
Loan delinquency[(a)]									
Current	$ 46,169 [(d)]	$ 12,829	$ 7,367	$ 4,521	$ 2,058	$ 742	$ 2,517	$ 158	$ 76,361
30–119 days past due	97	107	77	53	42	23	30	17	446
120 or more days past due	–	–	–	1	–	1	8	8	18
Total retained loans	$ 46,266	$ 12,936	$ 7,444	$ 4,575	$ 2,100	$ 766	$ 2,555	$ 183	$ 76,825
% of 30+ days past due to total retained loans	0.21 %	0.83 %	1.03 %	1.18 %	2.00 %	3.13 %	1.49 %	13.66 %	0.60 %

(a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.

(b) At December 31, 2021, auto and other loans excluded $667 million of PPP loans guaranteed by the SBA that are 30 or more days past due. These amounts have been excluded based upon the SBA guarantee. At December 31, 2020, all PPP loans guaranteed by the SBA were current.

(c) At December 31, 2021, included $4.4 billion of loans originated in 2021 and $1.0 billion of loans originated in 2020 in Business Banking under the PPP. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(d) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP.

Nonaccrual and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained auto and other consumer loans.

	Total Auto and other	
(in millions, except ratios)	**December 31, 2021**	December 31, 2020
Nonaccrual loans[(a)(b)(c)]	**119**	151
Geographic region[(d)]		
California	**$ 11,163**	$ 12,302
Texas	**7,859**	8,235
New York	**5,848**	8,824
Florida	**4,901**	4,668
Illinois	**2,930**	3,768
New Jersey	**2,355**	2,646
Pennsylvania	**2,004**	1,924
Arizona	**1,887**	2,465
Ohio	**1,843**	2,163
Louisiana	**1,801**	1,808
All other	**28,170**	28,022
Total retained loans	**$ 70,761**	$ 76,825

(a) At December 31, 2021, nonaccrual loans excluded $506 million of PPP loans 90 or more days past due and guaranteed by the SBA, of which $35 million is no longer accruing interest based on the guidelines set by the SBA. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting the guidelines set by the SBA. There were no loans that were not guaranteed by the SBA that are 90 or more days past due and still accruing interest at December 31, 2021 and 2020.

(b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.

(c) Interest income on nonaccrual loans recognized on a cash basis was not material for the years ended December 31, 2021 and 2020.

(d) The geographic regions presented in this table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.

Loan modifications

Certain auto and other loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

The impact of these modifications, as well as new TDRs, were not material to the Firm for the years ended December 31, 2021, 2020 and 2019. Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2021 and 2020 were not material.

Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Firm. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Firm does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The Firm generally originates new card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in the credit score calculation.

The following tables provide information on delinquency, which is the primary credit quality indicator for retained credit card loans.

	December 31, 2021		
(in millions, except ratios)	Within the revolving period	Converted to term loans[b]	Total
Loan delinquency[a]			
Current and less than 30 days past due and still accruing	$ **151,798**	$ **901**	$ **152,699**
30–89 days past due and still accruing	**770**	**59**	**829**
90 or more days past due and still accruing	**741**	**27**	**768**
Total retained loans	$ **153,309**	$ **987**	$ **154,296**
Loan delinquency ratios			
% of 30+ days past due to total retained loans	**0.99 %**	**8.71 %**	**1.04 %**
% of 90+ days past due to total retained loans	**0.48**	**2.74**	**0.50**

	December 31, 2020		
(in millions, except ratios)	Within the revolving period	Converted to term loans[b]	Total
Loan delinquency[a]			
Current and less than 30 days past due and still accruing	$ 139,783	$ 1,239	$ 141,022
30–89 days past due and still accruing	997	94	1,091
90 or more days past due and still accruing	1,277	42	1,319
Total retained loans	$ 142,057	$ 1,375	$ 143,432
Loan delinquency ratios			
% of 30+ days past due to total retained loans	1.60 %	9.89 %	1.68 %
% of 90+ days past due to total retained loans	0.90	3.05	0.92

(a) At December 31, 2021 and 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(b) Represents TDRs.

Other credit quality indicators

The following table provides information on other credit quality indicators for retained credit card loans.

(in millions, except ratios)	December 31, 2021	December 31, 2020
Geographic region[(a)]		
California	**$ 23,030**	$ 20,921
Texas	**15,879**	14,544
New York	**12,652**	11,919
Florida	**10,412**	9,562
Illinois	**8,530**	8,006
New Jersey	**6,367**	5,927
Ohio	**4,923**	4,673
Pennsylvania	**4,708**	4,476
Colorado	**4,573**	4,092
Michigan	**3,773**	3,553
All other	**59,449**	55,759
Total retained loans	**$ 154,296**	$ 143,432
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**88.5 %**	85.9 %
Less than 660	**11.3**	13.9
No FICO available	**0.2**	0.2

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2021.

Loan modifications

The Firm may offer loan modification programs granting concessions to credit card borrowers who are experiencing financial difficulty. The Firm grants concessions for most of the credit card loans under long-term programs. These modifications involve placing the customer on a fixed payment plan, generally for 60 months, and typically include reducing the interest rate on the credit card. Substantially all modifications under the Firm's long-term programs are considered to be TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with the Firm's standard charge-off policy. In most cases, the Firm does not reinstate the borrower's line of credit.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

Year ended December 31, (in millions, except weighted-average data)	2021	2020	2019
Balance of new TDRs[(a)]	**$ 393**	$ 818	$ 961
Weighted-average interest rate of loans – before TDR	**17.75 %**	18.04 %	19.07 %
Weighted-average interest rate of loans – after TDR	**5.14**	4.64	4.70
Balance of loans that redefaulted within one year of modification[(b)]	**$ 57**	$ 110	$ 148

(a) Represents the outstanding balance prior to modification.
(b) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the quarter in which they defaulted.

For credit card loans modified in TDRs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. Defaulted modified credit card loans remain in the modification program and continue to be charged off in accordance with the Firm's standard charge-off policy.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the internal risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the PD and the LGD. The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate internal risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., PD and LGD) may differ as they reflect internal historical experiences and assumptions. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The Firm's definition of criticized aligns with the U.S. banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Firm focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. Refer to Note 4 for further detail on industry concentrations.

The following tables provide information on internal risk rating, which is the primary credit quality indicator for retained wholesale loans.

December 31, (in millions, except ratios)	Secured by real estate		Commercial and industrial		Other[(b)]		Total retained loans	
	2021	2020	**2021**	2020	**2021**	2020	**2021**	2020
Loans by risk ratings								
Investment-grade	**$ 92,369**	$ 90,147	**$ 75,783**	$ 71,917	**$ 241,859**	$ 217,209	**$ 410,011**	$ 379,273
Noninvestment- grade:								
Noncriticized	**22,495**	26,129	**62,039**	57,870	**52,440**	33,053	**136,974**	117,052
Criticized performing	**3,645**	3,234	**6,900**	10,991	**770**	1,079	**11,315**	15,304
Criticized nonaccrual[(a)]	**326**	483	**969**	1,931	**759**	904	**2,054**	3,318
Total noninvestment- grade	**26,466**	29,846	**69,908**	70,792	**53,969**	35,036	**150,343**	135,674
Total retained loans	**$ 118,835**	$ 119,993	**$ 145,691**	$ 142,709	**$ 295,828**	$ 252,245	**$ 560,354**	$ 514,947
% of investment-grade to total retained loans	**77.73 %**	75.13 %	**52.02 %**	50.39 %	**81.76 %**	86.11 %	**73.17 %**	73.65 %
% of total criticized to total retained loans	**3.34**	3.10	**5.40**	9.05	**0.52**	0.79	**2.39**	3.62
% of criticized nonaccrual to total retained loans	**0.27**	0.40	**0.67**	1.35	**0.26**	0.36	**0.37**	0.64

(a) At December 31, 2021, nonaccrual loans excluded $127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial.
(b) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.

	Secured by real estate								
	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 23,346**	**$ 16,030**	**$ 17,265**	**$ 8,103**	**$ 7,325**	**$ 19,066**	**$ 1,226**	**$ 8**	**$ 92,369**
Noninvestment-grade	**5,364**	**3,826**	**4,564**	**3,806**	**2,834**	**5,613**	**458**	**1**	**26,466**
Total retained loans	**$ 28,710**	**$ 19,856**	**$ 21,829**	**$ 11,909**	**$ 10,159**	**$ 24,679**	**$ 1,684**	**$ 9**	**$ 118,835**

	Secured by real estate								
	December 31, 2020								
	Term loans by origination year[(a)]						Revolving loans		
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 17,004	$ 19,870	$ 12,448	$ 11,218	$ 13,611	$ 14,898	$ 1,098	$ –	$ 90,147
Noninvestment-grade	4,998	6,027	5,886	4,184	3,738	4,523	489	1	29,846
Total retained loans	$ 22,002	$ 25,897	$ 18,334	$ 15,402	$ 17,349	$ 19,421	$ 1,587	$ 1	$ 119,993

(a) Prior-period amounts have been revised to conform with the current presentation.

Commercial and industrial									
	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 21,342**	**$ 6,268**	**$ 3,609**	**$ 1,269**	**$ 1,108**	**$ 819**	**$ 41,367**	**$ 1**	**$ 75,783** (a)
Noninvestment-grade	**19,314**	**7,112**	**4,559**	**2,177**	**930**	**430**	**35,312**	**74**	**69,908**
Total retained loans	**$ 40,656**	**$ 13,380**	**$ 8,168**	**$ 3,446**	**$ 2,038**	**$ 1,249**	**$ 76,679**	**$ 75**	**$ 145,691**

Commercial and industrial									
	December 31, 2020								
	Term loans by origination year(b)						Revolving loans		
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 21,233	$ 7,341	$ 2,950	$ 1,756	$ 1,034	$ 1,178	$ 36,424	$ 1	$ 71,917 (c)
Noninvestment-grade	15,488	9,189	5,470	2,323	611	786	36,852	73	70,792
Total retained loans	$ 36,721	$ 16,530	$ 8,420	$ 4,079	$ 1,645	$ 1,964	$ 73,276	$ 74	$ 142,709

(a) At December 31, 2021, $1.1 billion of the $1.3 billion total PPP loans in the wholesale portfolio were commercial and industrial. Of the $1.1 billion, $698 million were originated in 2021 and $396 million were originated in 2020. PPP loans are guaranteed by the SBA and considered investment-grade. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.
(b) Prior-period amounts have been revised to conform with the current presentation.
(c) At December 31, 2020, $7.4 billion of the $8.0 billion total PPP loans in the wholesale portfolio were commercial and industrial.

Other(a)									
	December 31, 2021								
	Term loans by origination year						Revolving loans		
(in millions)	2021	2020	2019	2018	2017	Prior to 2017	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 26,782**	**$ 17,829**	**$ 6,125**	**$ 2,885**	**$ 3,868**	**$ 7,651**	**$ 176,118**	**$ 601**	**$ 241,859**
Noninvestment-grade	**16,905**	**2,399**	**1,455**	**935**	**218**	**467**	**31,585**	**5**	**53,969**
Total retained loans	**$ 43,687**	**$ 20,228**	**$ 7,580**	**$ 3,820**	**$ 4,086**	**$ 8,118**	**$ 207,703**	**$ 606**	**$ 295,828**

Other(a)									
	December 31, 2020								
	Term loans by origination year(b)						Revolving loans		
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 33,190	$ 11,116	$ 7,455	$ 6,804	$ 4,089	$ 8,252	$ 145,524	$ 779	$ 217,209
Noninvestment-grade	5,048	2,231	1,660	553	175	535	24,710	124	35,036
Total retained loans	$ 38,238	$ 13,347	$ 9,115	$ 7,357	$ 4,264	$ 8,787	$ 170,234	$ 903	$ 252,245

(a) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Global Private Bank clients within AWM). Refer to Note 14 for more information on SPEs.
(b) Prior-period amounts have been revised to conform with the current presentation.

The following table presents additional information on retained loans secured by real estate within the Wholesale portfolio, which consists of loans secured wholly or substantially by a lien or liens on real property at origination. Multifamily lending includes financing for acquisition, leasing and construction of apartment buildings. Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate. Included in secured by real estate loans is $5.7 billion and $6.4 billion as of December 31, 2021 and 2020, respectively, of construction and development loans made to finance land development and on-site construction of commercial, industrial, residential, or farm buildings.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total retained loans secured by real estate	
	2021	2020	**2021**	2020	**2021**	2020
Retained loans secured by real estate	**$ 73,801**	$ 73,078	**$ 45,034**	$ 46,915	**$ 118,835**	$ 119,993
Criticized	**1,671**	1,144	**2,300**	2,573	**3,971**	3,717
% of total criticized to total retained loans secured by real estate	**2.26 %**	1.57 %	**5.11 %**	5.48 %	**3.34 %**	3.10 %
Criticized nonaccrual	**$ 91**	$ 56	**$ 235**	$ 427	**$ 326**	$ 483
% of criticized nonaccrual loans to total retained loans secured by real estate	**0.12 %**	0.08 %	**0.52 %**	0.91 %	**0.27 %**	0.40 %

Geographic distribution and delinquency

The following table provides information on the geographic distribution and delinquency for retained wholesale loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2021	2020	**2021**	2020	**2021**	2020	**2021**	2020
Loans by geographic distribution[(a)]								
Total U.S.	**$ 115,732**	$ 116,990	**$ 106,449**	$ 109,273	**$ 215,750**	$ 180,583	**$ 437,931**	$ 406,846
Total non-U.S.	**3,103**	3,003	**39,242**	33,436	**80,078**	71,662	**122,423**	108,101
Total retained loans	**$ 118,835**	$ 119,993	**$ 145,691**	$ 142,709	**$ 295,828**	$ 252,245	**$ 560,354**	$ 514,947
Loan delinquency[(b)]								
Current and less than 30 days past due and still accruing	**$ 118,163**	$ 118,894	**$ 143,459**	$ 140,100	**$ 293,358**	$ 249,713	**$ 554,980**	$ 508,707
30–89 days past due and still accruing	**331**	601	**1,193**	658	**1,590**	1,606	**3,114**	2,865
90 or more days past due and still accruing[(c)]	**15**	15	**70**	20	**121**	22	**206**	57
Criticized nonaccrual[(d)]	**326**	483	**969**	1,931	**759**	904	**2,054**	3,318
Total retained loans	**$ 118,835**	$ 119,993	**$ 145,691**	$ 142,709	**$ 295,828**	$ 252,245	**$ 560,354**	$ 514,947

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) At December 31, 2021 and December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent. The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality.
(c) Represents loans that are considered well-collateralized and therefore still accruing interest.
(d) At December 31, 2021, nonaccrual loans excluded $127 million of PPP loans 90 or more days past due and guaranteed by the SBA, predominantly in commercial and industrial.

Nonaccrual loans

The following table provides information on retained wholesale nonaccrual loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2021	2020	**2021**	2020	**2021**	2020	**2021**	2020
Nonaccrual loans[(a)]								
With an allowance	**$ 254**	$ 351	**$ 604**	$ 1,667	**$ 286**	$ 800	**$ 1,144**	$ 2,818
Without an allowance[(b)]	**72**	132	**365**	264	**473**	104	**910**	500
Total nonaccrual loans[(c)]	**$ 326**	$ 483	**$ 969**	$ 1,931	**$ 759**	$ 904	**$ 2,054**	$ 3,318

(a) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2021, substantially all of these loans were considered performing.

(b) When the discounted cash flows or collateral value equals or exceeds the amortized cost of the loan, the loan does not require an allowance. This typically occurs when the loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.

(c) Interest income on nonaccrual loans recognized on a cash basis were not material for the years ended December 31, 2021 and 2020.

Loan modifications

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to suspend TDR accounting guidance under the option provided by the CARES Act. New TDRs during the years ended December 31, 2021, 2020 and 2019 were $881 million, $734 million and $407 million, respectively. New TDRs during the years ended December 31, 2021, 2020 and 2019 reflected deferral of principal and interest payments, extending maturity dates and the receipt of assets in partial satisfaction of the loan predominantly in Other and Commercial and Industrial loan classes. The impact of these modifications resulting in new TDRs was not material to the Firm for the years ended December 31, 2021, 2020 and 2019. The carrying value of TDRs was $607 million and $954 million as of December 31, 2021 and 2020, respectively.

Note 13 – Allowance for credit losses

The Firm’s allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm’s retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is recognized within investment securities on the Consolidated balance sheets.

The income statement effect of all changes in the allowance for credit losses is recognized in the provision for credit losses.

Determining the appropriateness of the allowance for credit losses is complex and requires significant judgment by management about the effect of matters that are inherently uncertain. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of the Firm. Subsequent evaluations of credit exposures, considering the macroeconomic conditions, forecasts and other factors then prevailing, may result in significant changes in the allowance for credit losses in future periods.

The Firm’s policies used to determine its allowance for loan losses and its allowance for lending-related commitments are described in the following paragraphs. Refer to Note 10 for a description of the policies used to determine the allowance for credit losses on investment securities.

Methodology for allowances for loan losses and lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represents expected credit losses over the remaining expected life of retained loans and lending-related commitments that are not unconditionally cancellable. The Firm does not record an allowance for future draws on unconditionally cancellable lending-related commitments (e.g., credit cards). Expected losses related to accrued interest on credit card loans and certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm’s allowance for loan losses. However, the Firm does not record an allowance on other accrued interest receivables, due to its policy to write these receivables off no later than 90 days past due by reversing interest income.

The expected life of each instrument is determined by considering its contractual term, expected prepayments, cancellation features, and certain extension and call options. The expected life of funded credit card loans is generally estimated by considering expected future payments on the credit card account, and determining how much of those amounts should be allocated to repayments of the funded loan balance (as of the balance sheet date) versus other account activity. This allocation is made using an approach that incorporates the payment application requirements of the Credit Card Accountability Responsibility and Disclosure Act of 2009, generally paying down the highest interest rate balances first.

The estimate of expected credit losses includes expected recoveries of amounts previously charged off or expected to be charged off, even if such recoveries result in a negative allowance.

Collective and Individual Assessments

When calculating the allowance for loan losses and the allowance for lending-related commitments, the Firm assesses whether exposures share similar risk characteristics. If similar risk characteristics exist, the Firm estimates expected credit losses collectively, considering the risk associated with a particular pool and the probability that the exposures within the pool will deteriorate or default. The assessment of risk characteristics is subject to significant management judgment. Emphasizing one characteristic over another or considering additional characteristics could affect the allowance.

- Relevant risk characteristics for the consumer portfolio include product type, delinquency status, current FICO scores, geographic distribution, and, for collateralized loans, current LTV ratios.
- Relevant risk characteristics for the wholesale portfolio include LOB, geography, risk rating, delinquency status, level and type of collateral, industry, credit enhancement, product type, facility purpose, tenor, and payment terms.

The majority of the Firm’s credit exposures share risk characteristics with other similar exposures, and as a result are collectively assessed for impairment (“portfolio-based component”). The portfolio-based component covers consumer loans, performing risk-rated loans and certain lending-related commitments.

If an exposure does not share risk characteristics with other exposures, the Firm generally estimates expected credit losses on an individual basis, considering expected repayment and conditions impacting that individual exposure (“asset-specific component”). The asset-specific component covers modified PCD loans, loans modified or reasonably expected to be modified in a TDR, collateral-dependent loans, as well as, risk-rated loans that have been placed on nonaccrual status.

Portfolio-based component

The portfolio-based component begins with a quantitative calculation that considers the likelihood of the borrower changing delinquency status or moving from one risk rating to another. The quantitative calculation covers expected credit losses over an instrument’s expected life and is estimated by applying credit loss factors to the Firm’s estimated exposure at default. The credit loss factors incorporate the probability of borrower default as well as loss severity in the event of default. They are derived using a weighted average of five internally developed macroeconomic scenarios over an eight-quarter forecast period, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the eight-quarter forecast period. The five macroeconomic scenarios consist of a central, relative adverse, extreme adverse, relative upside and extreme upside scenario, and are updated by the Firm's central forecasting team. The scenarios take into consideration the Firm's macroeconomic outlook, internal perspectives from subject matter experts across the Firm, and market consensus and involve a governed process that incorporates feedback from senior management across LOBs, Corporate Finance and Risk Management.

The quantitative calculation is adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet reflected in the calculation. These adjustments are accomplished in part by analyzing the historical loss experience, including during stressed periods, for each major product or model. Management applies judgment in making this adjustment, including taking into account uncertainties associated with the economic and political conditions, quality of underwriting standards, borrower behavior, credit concentrations or deterioration within an industry, product or portfolio, as well as other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties.

The application of different inputs into the quantitative calculation, and the assumptions used by management to adjust the quantitative calculation, are subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for loan losses and the allowance for lending-related commitments.

Asset-specific component

To determine the asset-specific component of the allowance, collateral-dependent loans (including those loans for which foreclosure is probable) and larger, nonaccrual risk-rated loans in the wholesale portfolio segment are generally evaluated individually, while smaller loans (both scored and risk-rated) are aggregated for evaluation using factors relevant for the respective class of assets.

The Firm generally measures the asset-specific allowance as the difference between the amortized cost of the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are generally recognized as an adjustment to the allowance for loan losses. For collateral-dependent loans, the fair value of collateral less estimated costs to sell is used to determine the charge-off amount for declines in value (to reduce the amortized cost of the loan to the fair value of collateral) or the amount of negative allowance that should be recognized (for recoveries of prior charge-offs associated with improvements in the fair value of collateral).

The asset-specific component of the allowance for loans that have been or are expected to be modified in TDRs incorporates the effect of the modification on the loan's expected cash flows (including forgone interest, principal forgiveness, as well as other concessions), and also the potential for redefault. For residential real estate loans modified in or expected to be modified in TDRs, the Firm develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, the Firm considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about housing prices and unemployment, based upon industry-wide data. The Firm also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in or expected to be modified in TDRs, expected losses incorporate projected delinquencies and charge-offs based on the Firm's historical experience by type of modification program. For wholesale loans modified or expected to be modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry, portfolio, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Allowance for credit losses and related information

The table below summarizes information about the allowances for credit losses, and includes a breakdown of loans and lending-related commitments by impairment methodology. Refer to Note 10 for further information on the allowance for credit losses on investment securities.

(Table continued on next page)

	2021			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 3,636	$ 17,800	$ 6,892	$ 28,328
Cumulative effect of a change in accounting principle[(a)]	NA	NA	NA	NA
Gross charge-offs	630	3,651	283	4,564
Gross recoveries collected	(619)	(939)	(141)	(1,699)
Net charge-offs	11	2,712	142	2,865
Write-offs of PCI loans[(b)]	NA	NA	NA	NA
Provision for loan losses	(1,858)	(4,838)	(2,375)	(9,071)
Other	(2)	–	(4)	(6)
Ending balance at December 31,	$ 1,765	$ 10,250	$ 4,371	$ 16,386
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 187	$ –	$ 2,222	$ 2,409
Cumulative effect of a change in accounting principle[(a)]	NA	NA	NA	NA
Provision for lending-related commitments	(75)	–	(74)	(149)
Other	1	–	–	1
Ending balance at December 31,	$ 113	$ –	$ 2,148	$ 2,261
Total allowance for investment securities	NA	NA	NA	$ 42
Total allowance for credit losses	$ 1,878	$ 10,250	$ 6,519	$ 18,689
Allowance for loan losses by impairment methodology				
Asset-specific[(c)]	$ (665)	$ 313	$ 263	$ (89)
Portfolio-based	2,430	9,937	4,108	16,475
PCI	NA	NA	NA	NA
Total allowance for loan losses	$ 1,765	$ 10,250	$ 4,371	$ 16,386
Loans by impairment methodology				
Asset-specific[(c)]	$ 13,919	$ 987	$ 2,255	$ 17,161
Portfolio-based	281,637	153,309	558,099	993,045
PCI	NA	NA	NA	NA
Total retained loans	$ 295,556	$ 154,296	$ 560,354	$ 1,010,206
Collateral-dependent loans				
Net charge-offs	$ 33	$ –	$ 38	$ 71
Loans measured at fair value of collateral less cost to sell	4,472	–	617	5,089
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 167	$ 167
Portfolio-based	113	–	1,981	2,094
Total allowance for lending-related commitments[(d)]	$ 113	$ –	$ 2,148	$ 2,261
Lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 764	$ 764
Portfolio-based[(e)]	29,588	–	453,571	483,159
Total lending-related commitments	$ 29,588	$ –	$ 454,335	$ 483,923

(a) Represents the impact to allowance for credit losses upon the adoption of CECL on January 1, 2020. Refer to Note 1 for further information.
(b) Prior to the adoption of CECL, write-offs of PCI loans were recorded against the allowance for loan losses when actual losses for a pool exceeded estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan was recognized when the underlying loan was removed from a pool.
(c) Includes collateral dependent loans, including those considered TDRs and those for which foreclosure is deemed probable, modified PCD loans and non-collateral dependent loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been

placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loans modified, or reasonably expected to be modified, in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(d) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.

(e) At December 31, 2021, 2020 and 2019, lending-related commitments excluded $15.7 billion, $19.5 billion and $9.8 billion, respectively, for the consumer, excluding credit card portfolio segment; $730.5 billion, $658.5 billion and $650.7 billion, respectively, for the credit card portfolio segment; and $32.1 billion, $25.3 billion and $24.1 billion, respectively, for the wholesale portfolio segment, which were not subject to the allowance for lending-related commitments. Prior-period amount for wholesale lending-related commitments, including the amount not subject to allowance, has been revised to conform with the current presentation.

(table continued from previous page)

2020				2019			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 2,538	$ 5,683	$ 4,902	$ 13,123	$ 3,434	$ 5,184	$ 4,827	$ 13,445
297	5,517	(1,642)	4,172	NA	NA	NA	NA
805	5,077	954	6,836	902	5,436	472	6,810
(631)	(791)	(155)	(1,577)	(536)	(588)	(57)	(1,181)
174	4,286	799	5,259	366	4,848	415	5,629
NA	NA	NA	NA	151	–	–	151
974	10,886	4,431	16,291	(378)	5,348	479	5,449
1	–	–	1	(1)	(1)	11	9
$ 3,636	$ 17,800	$ 6,892	$ 28,328	$ 2,538	$ 5,683	$ 4,902	$ 13,123
$ 12	$ –	$ 1,179	$ 1,191	$ 12	$ –	$ 1,043	$ 1,055
133	–	(35)	98	NA	NA	NA	NA
42	–	1,079	1,121	–	–	136	136
–	–	(1)	(1)	–	–	–	–
$ 187	$ –	$ 2,222	$ 2,409	$ 12	$ –	$ 1,179	$ 1,191
NA	NA	NA	$ 78	NA	NA	NA	NA
$ 3,823	$ 17,800	$ 9,114	$ 30,815	$ 2,550	$ 5,683	$ 6,081	$ 14,314
$ (7)	$ 633	$ 682	$ 1,308	$ 75	$ 477	$ 295	$ 847
3,643	17,167	6,210	27,020	1,476	5,206	4,607	11,289
NA	NA	NA	NA	987	–	–	987
$ 3,636	$ 17,800	$ 6,892	$ 28,328	$ 2,538	$ 5,683	$ 4,902	$ 13,123
$ 16,648	$ 1,375	$ 3,606	$ 21,629	$ 5,961	$ 1,452	$ 1,123	$ 8,536
285,479	142,057	511,341	938,877	268,675	167,472	480,555	916,702
NA	NA	NA	NA	20,363	–	–	20,363
$ 302,127	$ 143,432	$ 514,947	$ 960,506	$ 294,999	$ 168,924	$ 481,678	$ 945,601
$ 133	$ –	$ 76	$ 209	$ 46	$ –	$ 36	$ 82
4,956	–	188	5,144	2,053	–	87	2,140
$ –	$ –	$ 114	$ 114	$ –	$ –	$ 102	$ 102
187	–	2,108	2,295	12	–	1,077	1,089
$ 187	$ –	$ 2,222	$ 2,409	$ 12	$ –	$ 1,179	$ 1,191
$ –	$ –	$ 577	$ 577	$ –	$ –	$ 474	$ 474
37,783	–	423,993	461,776	30,417	–	392,967	423,384
$ 37,783	$ –	$ 424,570	$ 462,353	$ 30,417	$ –	$ 393,441	$ 423,858

Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2021 was $18.7 billion, a decrease from $30.8 billion at December 31, 2020. The decrease in the allowance for credit losses was primarily driven by improvements in the macroeconomic environment, consisting of:

- a $9.5 billion reduction in consumer, predominantly in the credit card portfolio; and
- a $2.6 billion net reduction in wholesale, across the LOBs.

The Firm's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. As of December 31, 2021, the Firm assigned more balanced weightings to both its adverse and upside scenarios compared to the significant weighting that the Firm placed on its adverse scenarios as of December 31, 2020, reflecting the sustained improvement and resilience of the macroeconomic environment, despite the ongoing impact of the COVID-19 pandemic. In addition, because the impact of the COVID-19 pandemic and governmental actions taken in response to the pandemic caused a dislocation in certain historical relationships used for modeling credit loss estimates, the Firm continues to place reliance on management judgment and make adjustments specific to that dislocation, although to a lesser extent than in 2020. The allowance for credit losses of $18.7 billion reflects remaining uncertainties, including the potential impact that additional waves or variants of COVID-19 may have on the pace of economic growth and near-term supply chain disruptions.

The Firm's central case assumptions reflected U.S. unemployment rates and year over year growth in U.S. real GDP as follows:

	Assumptions at December 31, 2021		
	2Q22	**4Q22**	**2Q23**
U.S. unemployment rate[(a)]	**4.2 %**	**4.0 %**	**3.9 %**
YoY growth in U.S. real GDP[(b)]	**3.1 %**	**2.8 %**	**2.1 %**

	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate[(a)]	6.8 %	5.7 %	5.1 %
YoY growth in U.S. real GDP[(b)]	9.2 %	3.5 %	3.9 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) As of December 31, 2021, the year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percent change in U.S. real GDP levels from the prior year. This year over year growth rate replaces the previously disclosed pandemic-focused measure of the cumulative change in U.S. real GDP from pre-pandemic conditions at December 31, 2019. Prior periods have been revised to conform with the current presentation.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 150-153 for further information on the allowance for credit losses and related management judgments.
Refer to Consumer Credit Portfolio on pages 110-116, Wholesale Credit Portfolio on pages 117-128 for additional information on the consumer and wholesale credit portfolios.

Note 14 – Variable interest entities

Refer to Note 1 on page 165 for a further description of JPMorgan Chase's accounting policies regarding consolidation of VIEs.

The following table summarizes the most significant types of Firm-sponsored VIEs by business segment. The Firm considers a "Firm-sponsored" VIE to include any entity where: (1) JPMorgan Chase is the primary beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize Firm assets; (3) the VIE issues financial instruments with the JPMorgan Chase name; or (4) the entity is a JPMorgan Chase–administered asset-backed commercial paper conduit.

Line of Business	*Transaction Type*	*Activity*	*2021 Form 10-K page references*
CCB	Credit card securitization trusts	Securitization of originated credit card receivables	253-254
	Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	254-256
CIB	Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	254-256
	Multi-seller conduits	Assisting clients in accessing the financial markets in a cost-efficient manner and structuring transactions to meet investor needs	256
	Municipal bond vehicles	Financing of municipal bond investments	256-257

The Firm's other business segments are also involved with VIEs (both third-party and Firm-sponsored), but to a lesser extent, as follows:

- Asset & Wealth Management: AWM sponsors and manages certain funds that are deemed VIEs. As asset manager of the funds, AWM earns a fee based on assets managed; the fee varies with each fund's investment objective and is competitively priced. For fund entities that qualify as VIEs, AWM's interests are, in certain cases, considered to be significant variable interests that result in consolidation of the financial results of these entities.
- Commercial Banking: CB provides financing and lending-related services to a wide spectrum of clients, including certain third-party-sponsored entities that may meet the definition of a VIE. CB does not control the activities of these entities and does not consolidate these entities. CB's maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- Corporate: Corporate is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs. In addition, Treasury and CIO invest in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Firm does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. Refer to Note 10 for further information on the Firm's investment securities portfolio.

In addition, CIB also invests in and provides financing and other services to VIEs sponsored by third parties. Refer to pages 257-258 of this Note for more information on consolidated VIE assets and liabilities as well as the VIEs sponsored by third parties.

Significant Firm-sponsored variable interest entities

Credit card securitizations

CCB's Card business may securitize originated credit card loans, primarily through the Chase Issuance Trust (the "Trust"). The Firm's continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller's interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Firm consolidates the assets and liabilities of its sponsored credit card trusts as it is considered to be the primary beneficiary of these securitization trusts based on the Firm's ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and extent of the Firm's other continuing involvement with the trusts, as indicated above, obligates the Firm to absorb losses and gives the Firm the right to receive certain benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Firm's other obligations or the claims of the Firm's creditors.

The agreements with the credit card securitization trusts require the Firm to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2021 and 2020, the Firm held undivided interests in Firm-sponsored credit card securitization trusts of $7.1 billion and $5.4 billion, respectively. The Firm maintained an average undivided interest in principal receivables owned by those trusts of approximately 57% and 39% for the years ended December 31, 2021 and 2020, respectively. The Firm did not retain any senior securities and retained $1.5 billion of subordinated securities in certain of its credit card securitization trusts at both December 31, 2021 and 2020. The Firm's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

Firm-sponsored mortgage and other securitization trusts
The Firm securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans primarily in its CCB and CIB businesses. Depending on the particular transaction, as well as the respective business involved, the Firm may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following tables present the total unpaid principal amount of assets held in Firm-sponsored private-label securitization entities, including those in which the Firm has continuing involvement, and those that are consolidated by the Firm. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative contracts. In certain instances, the Firm's only continuing involvement is servicing the loans. The Firm's maximum loss exposure from retained and purchased interests is the carrying value of these interests.

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2021 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 55,085**	**$ 942**	**$ 47,029**	**$ 974**	**$ 684**	**$ 95**	**$ 1,753**
Subprime	**10,966**	**27**	**10,115**	**2**	**–**	**–**	**2**
Commercial and other[b]	**150,694**	**–**	**93,698**	**671**	**3,274**	**506**	**4,451**
Total	**$ 216,745**	**$ 969**	**$ 150,842**	**$ 1,647**	**$ 3,958**	**$ 601**	**$ 6,206**

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2020 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 49,644	$ 1,693	$ 41,265	$ 574	$ 724	$ –	$ 1,298
Subprime	12,896	46	12,154	9	–	–	9
Commercial and other[b]	119,732	–	92,351	955	1,549	262	2,766
Total	$ 182,272	$ 1,739	$ 145,770	$ 1,538	$ 2,273	$ 262	$ 4,073

(a) Excludes U.S. GSEs and government agency securitizations and re-securitizations, which are not Firm-sponsored.
(b) Consists of securities backed by commercial real estate loans and non-mortgage-related consumer receivables purchased from third parties.
(c) Excludes the following: retained servicing; securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities; senior and subordinated securities of $145 million and $36 million, respectively, at December 31, 2021, and $105 million and $40 million, respectively, at December 31, 2020, which the Firm purchased in connection with CIB's secondary market-making activities.
(d) Includes interests held in re-securitization transactions.
(e) As of December 31, 2021 and 2020, 79% and 73%, respectively, of the Firm's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of $1.6 billion and $1.3 billion of investment-grade retained interests, and $131 million and $41 million of noninvestment-grade retained interests at December 31, 2021 and 2020, respectively. The retained interests in commercial and other securitization trusts consisted of $3.5 billion and $2.0 billion of investment-grade retained interests, and $929 million and $753 million of noninvestment-grade retained interests at December 31, 2021 and 2020, respectively.

Residential mortgage
The Firm securitizes residential mortgage loans originated by CCB, as well as residential mortgage loans purchased from third parties by either CCB or CIB. CCB generally retains servicing for all residential mortgage loans it originated or purchased, and for certain mortgage loans purchased by CIB. For securitizations of loans serviced by CCB, the Firm has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. CCB may also retain an interest upon securitization.

In addition, CIB engages in underwriting and trading activities involving securities issued by Firm-sponsored securitization trusts. As a result, CIB at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by CIB or held by Treasury and CIO or CCB, when considered together with the servicing arrangements entered into by CCB, the Firm is deemed to be the primary beneficiary of certain securitization trusts.

The Firm does not consolidate residential mortgage securitizations (Firm-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust.

Commercial mortgages and other consumer securitizations
CIB originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. CIB may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Firm does not service commercial loan securitizations. Treasury and CIO may choose to invest in these securitizations as well. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). The Firm generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions.

Re-securitizations
The Firm engages in certain re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. These transfers occur in connection with both U.S. GSEs and government agency sponsored VIEs, which are backed by residential mortgages. The Firm's consolidation analysis is largely dependent on the Firm's role and interest in the re-securitization trusts.

The following table presents the principal amount of securities transferred to re-securitization VIEs.

Year ended December 31, (in millions)	2021	2020	2019
Transfers of securities to VIEs			
U.S. GSEs and government agencies	**$ 53,923**	$ 46,123	$ 25,852

Most re-securitizations with which the Firm is involved are client-driven transactions in which a specific client or group of clients is seeking a specific return or risk profile. For these transactions, the Firm has concluded that the decision-making power of the entity is shared between the Firm and its clients, considering the joint effort and decisions in establishing the re-securitization trust and its assets, as well as the significant economic interest the client holds in the re-securitization trust; therefore the Firm does not consolidate the re-securitization VIE.

The Firm did not transfer any private label securities to re-securitization VIEs during 2021, 2020 and 2019, respectively, and retained interests in any such Firm-sponsored VIEs as of December 31, 2021 and 2020 were immaterial.

Additionally, the Firm may invest in beneficial interests of third-party-sponsored re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Firm does not have the unilateral ability to direct the most significant activities of the re-securitization trust, either because it was not involved in the initial design of the trust, or the Firm was involved with an independent third-party sponsor and demonstrated shared power over the creation of the trust; therefore, the Firm does not consolidate the re-securitization VIE.

The following table presents information on the Firm's interests in nonconsolidated re-securitization VIEs.

December 31, (in millions)	Nonconsolidated re-securitization VIEs 2021	2020
U.S. GSEs and government agencies		
Interest in VIEs	$ **1,947**	$ 2,631

As of December 31, 2021 and 2020, the Firm did not consolidate any U.S. GSE and government agency re-securitization VIEs or any Firm-sponsored private-label re-securitization VIEs.

Multi-seller conduits

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Firm. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Firm’s potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Firm consolidates its Firm-administered multi-seller conduits, as the Firm has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Firm makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Firm’s interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits.

In the normal course of business, JPMorgan Chase makes markets in and invests in commercial paper issued by the Firm-administered multi-seller conduits. The Firm held $13.7 billion and $13.5 billion of the commercial paper issued by the Firm-administered multi-seller conduits at December 31, 2021 and 2020, respectively, which have been eliminated in consolidation. The Firm’s investments reflect the Firm’s funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Firm is not obligated under any agreement to purchase the commercial paper issued by the Firm-administered multi-seller conduits.

Deal-specific liquidity facilities, program-wide liquidity and credit enhancement provided by the Firm have been eliminated in consolidation. The Firm or the Firm-administered multi-seller conduits provide lending-related commitments to certain clients of the Firm-administered multi-seller conduits. The unfunded commitments were $13.4 billion and $12.2 billion at December 31, 2021 and 2020, respectively, and are reported as off-balance sheet lending-related commitments in other unfunded commitments to extend credit. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Municipal bond vehicles

Municipal bond vehicles or tender option bond (“TOB”) trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates (“floaters”) and (2) inverse floating-rate residual interests (“residuals”). The floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the residual is held by a third-party investor are typically known as customer TOB trusts, and non-customer TOB trusts are transactions where the Residual is retained by the Firm. Customer TOB trusts are sponsored by a third party. The Firm serves as sponsor for all non-customer TOB transactions. The Firm may provide various services to a TOB trust, including remarketing agent, liquidity or tender option provider, and/or sponsor.

J.P. Morgan Securities LLC may serve as a remarketing agent on the floaters for TOB trusts. The remarketing agent is responsible for establishing the periodic variable rate on the floaters, conducting the initial placement and remarketing tendered floaters. The remarketing agent may, but is not obligated to, make markets in floaters. Floaters held by the Firm were not material during 2021 and 2020.

JPMorgan Chase Bank, N.A. or J.P. Morgan Securities LLC often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider’s obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the floaters may "put," or tender, their floaters to the TOB trust. If the remarketing agent cannot successfully remarket the floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust's purchase of the floaters, or it directly purchases the tendered floaters.

TOB trusts are considered to be variable interest entities. The Firm consolidates non-customer TOB trusts because as the Residual holder, the Firm has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Firm as of December 31, 2021 and 2020.

	Assets				Liabilities		
December 31, 2021 (in millions)	Trading assets	Loans	Other[c]	Total assets[d]	Beneficial interests in VIE assets[e]	Other[f]	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	$ –	$ 11,108	$ 102	$ 11,210	$ 2,397	$ 1	$ 2,398
Firm-administered multi-seller conduits	1	19,883	71	19,955	6,198	41	6,239
Municipal bond vehicles	2,009	–	2	2,011	1,976	–	1,976
Mortgage securitization entities[a]	–	955	32	987	179	85	264
Other	–	1,078 [b]	283	1,361	–	118	118
Total	**$ 2,010**	**$ 33,024**	**$ 490**	**$ 35,524**	**$ 10,750**	**$ 245**	**$ 10,995**

	Assets				Liabilities		
December 31, 2020 (in millions)	Trading assets	Loans	Other[c]	Total assets[d]	Beneficial interests in VIE assets[e]	Other[f]	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	$ –	$ 11,962	$ 148	$ 12,110	$ 4,943	$ 3	$ 4,946
Firm-administered multi-seller conduits	2	23,787	188	23,977	10,523	33	10,556
Municipal bond vehicles	1,930	–	2	1,932	1,902	–	1,902
Mortgage securitization entities[a]	–	1,694	94	1,788	210	108	318
Other	2	176	249	427	–	89	89
Total	$ 1,934	$ 37,619	$ 681	$ 40,234	$ 17,578	$ 233	$ 17,811

(a) Includes residential and commercial mortgage securitizations.
(b) Largely includes purchased supply chain finance receivables and purchased auto loan securitizations in CIB.
(c) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(d) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation.
(e) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated variable interest entities." The holders of these beneficial interests generally do not have recourse to the general credit of JPMorgan Chase. Included in beneficial interests in VIE assets are long-term beneficial interests of $2.6 billion and $5.2 billion at December 31, 2021 and 2020, respectively.
(f) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

VIEs sponsored by third parties

The Firm enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Firm does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Firm generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

The Firm holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that own and operate affordable housing, energy, and other projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Firm does not consolidate tax credit vehicles. The Firm generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was $26.8 billion and $23.6 billion, of which $9.4 billion and $8.7 billion was unfunded at December 31, 2021 and 2020, respectively. The prior-period maximum loss exposure amount has been revised to conform with the current presentation. The Firm assesses each project and to reduce the risk of loss, may withhold varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 25 for further information on affordable housing tax credits. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Customer municipal bond vehicles (TOB trusts)

The Firm may provide various services to customer TOB trusts, including remarketing agent, liquidity or tender option provider. In certain customer TOB transactions, the Firm, as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, the Firm has recourse to the third-party Residual holders for any shortfall. The Firm does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Firm does not consolidate customer TOB trusts, since the Firm does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. The Firm's maximum exposure as a liquidity provider to customer TOB trusts at December 31, 2021 and 2020, was $6.8 billion and $6.7 billion, respectively. The fair value of assets held by such VIEs at both December 31, 2021 and 2020 was $10.5 billion.

Loan securitizations

The Firm has securitized and sold a variety of loans, including residential mortgages, credit card receivables, and commercial mortgages. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Firm.

For loan securitizations in which the Firm is not required to consolidate the trust, the Firm records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Firm's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) the Firm does not maintain effective control over the transferred financial assets (e.g., the Firm cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Firm recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to the Firm's securitization activities for the years ended December 31, 2021, 2020 and 2019, related to assets held in Firm-sponsored securitization entities that were not consolidated by the Firm, and where sale accounting was achieved at the time of the securitization.

Year ended December 31, (in millions)	2021 Residential mortgage[d]	2021 Commercial and other[e]	2020 Residential mortgage[d]	2020 Commercial and other[e]	2019 Residential mortgage[d]	2019 Commercial and other[e]
Principal securitized	**$ 23,876**	**$ 14,917**	$ 7,103	$ 6,624	$ 9,957	$ 9,390
All cash flows during the period:[a]						
Proceeds received from loan sales as financial instruments[b][c]	**$ 24,450**	**$ 15,044**	$ 7,321	$ 6,865	$ 10,238	$ 9,544
Servicing fees collected	**153**	**1**	211	1	287	2
Cash flows received on interests	**578**	**273**	801	239	507	237

(a) Excludes re-securitization transactions.
(b) Predominantly includes Level 2 assets.
(c) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.
(d) Represents prime mortgages. Excludes loan securitization activity related to U.S. GSEs and government agencies.
(e) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	2021	2020	2019
Residential mortgage retained interest:			
Weighted-average life (in years)	**3.9**	4.7	4.8
Weighted-average discount rate	**3.3 %**	8.2 %	7.4 %
Commercial mortgage retained interest:			
Weighted-average life (in years)	**6.0**	6.9	6.4
Weighted-average discount rate	**1.2 %**	3.0 %	4.1 %

Loans and excess MSRs sold to U.S. government-sponsored enterprises and loans in securitization transactions pursuant to Ginnie Mae guidelines

In addition to the amounts reported in the securitization activity tables above, the Firm, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSRs on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSRs are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Firm also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Firm does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Firm is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. Refer to Note 28 for additional information about the Firm's loan sales- and securitization-related indemnifications. Refer to Note 15 for additional information on MSRs.

The following table summarizes the activities related to loans sold to the U.S. GSEs, and loans in securitization transactions pursuant to Ginnie Mae guidelines.

Year ended December 31, (in millions)	2021	2020	2019
Carrying value of loans sold	$ 105,035	$ 81,153	$ 92,349
Proceeds received from loan sales as cash	$ 161	$ 45	$ 73
Proceeds from loan sales as securities[(a)(b)]	103,286	80,186	91,422
Total proceeds received from loan sales[(c)]	$ 103,447	$ 80,231	$ 91,495
Gains/(losses) on loan sales[(d)(e)]	$ 9	$ 6	$ 499

(a) Includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt or retained as part of the Firm's investment securities portfolio.
(b) Included in Level 2 assets.
(c) Excludes the value of MSRs retained upon the sale of loans.
(d) Gains/(losses) on loan sales include the value of MSRs.
(e) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to the Firm's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 28, the Firm also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Firm typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Firm's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability. Refer to Note 12 for additional information.

The following table presents loans the Firm repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Firm's Consolidated balance sheets as of December 31, 2021 and 2020. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2021	2020
Loans repurchased or option to repurchase[(a)]	$ 1,022	$ 1,413
Real estate owned	5	9
Foreclosed government-guaranteed residential mortgage loans[(b)]	36	64

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of and delinquencies related to nonconsolidated securitized financial assets held in Firm-sponsored private-label securitization entities, in which the Firm has continuing involvement as of December 31, 2021 and 2020.

	Securitized assets		90 days past due		Net liquidation losses	
As of or for the year ended December 31, (in millions)	2021	2020	2021	2020	2021	2020
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	$ 47,029	$ 41,265	$ 2,466	$ 4,988	$ 17	$ 212
Subprime	10,115	12,154	1,609	2,406	16	179
Commercial and other	93,698	92,351	1,456	5,958	288	30
Total loans securitized	$ 150,842	$ 145,770	$ 5,531	$ 13,352	$ 321	$ 421

Note 15 – Goodwill and Mortgage servicing rights

Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired, and can be adjusted up to one year from the acquisition date as more information is obtained about the fair value of assets acquired and liabilities assumed. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be an impairment.

The goodwill associated with each business combination is allocated to the related reporting units, which are generally determined based on how the Firm's businesses are managed and how they are reviewed. The following table presents goodwill attributed to the reportable business segments and Corporate.

December 31, (in millions)	2021	2020	2019
Consumer & Community Banking	**$ 31,474**	$ 31,311	$ 30,133
Corporate & Investment Bank	**7,906**	7,913	7,901
Commercial Banking	**2,986**	2,985	2,982
Asset & Wealth Management	**7,222**	7,039	6,807
Corporate[(a)]	**727**	–	–
Total goodwill	**$ 50,315**	$ 49,248	$ 47,823

(a) For goodwill in Corporate acquired in the third quarter of 2021, the Firm elected to perform a qualitative impairment assessment, as permitted under U.S. GAAP.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	2021	2020	2019
Balance at beginning of period	**$ 49,248**	$ 47,823	$ 47,471
Changes during the period from:			
Business combinations[(a)]	**1,124**	1,412	349
Other[(b)]	**(57)**	13	3
Balance at December 31,	**$ 50,315**	$ 49,248	$ 47,823

(a) For 2021, represents estimated goodwill associated with the acquisitions of Nutmeg in Corporate, OpenInvest and Campbell Global in AWM, and Frank and The Infatuation in CCB. For 2020, represents estimated goodwill associated with the acquisitions of cxLoyalty in CCB and 55ip in AWM. For 2019, represents goodwill associated with the acquisition of InstaMed. This goodwill was allocated to CIB, CB and CCB.
(b) Primarily foreign currency adjustments and adjustments to goodwill related to prior period acquisitions.

Goodwill impairment testing

The Firm's goodwill was not impaired at December 31, 2021, 2020 and 2019.

Effective January 1, 2020, the Firm adopted new accounting guidance related to goodwill impairment testing. The adoption of the guidance requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value. It eliminated the requirement that an impairment loss be recognized only if the estimated implied fair value of the goodwill is below its carrying value.

The goodwill impairment test is generally performed by comparing the current fair value of each reporting unit with its carrying value. If the fair value is in excess of the carrying value, then the reporting unit's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then an impairment charge is recognized for the amount by which the reporting unit's carrying value exceeds its fair value, up to the amount of goodwill allocated to that reporting unit.

The Firm uses the reporting units' allocated capital plus goodwill and other intangible assets as a proxy for the carrying values of equity for the reporting units in the goodwill impairment testing. Reporting unit equity is determined on a similar basis as the allocation of capital to the LOBs which takes into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. Proposed LOB capital levels are incorporated into the Firm's annual budget process, which is reviewed by the Firm's Board of Directors. Allocated capital is further reviewed periodically and updated as needed.

The primary method the Firm uses to estimate the fair value of its reporting units is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate. Projections of cash flows are based on the reporting units' earnings forecasts which are reviewed with senior management of the Firm. The discount rate used for each reporting unit represents an estimate of the cost of equity for that reporting unit and is determined considering the Firm's overall estimated cost of equity (estimated using the Capital Asset Pricing Model), as adjusted for the risk characteristics specific to each reporting unit (for example, for higher levels of risk or uncertainty associated with the business or management's forecasts and assumptions). To assess the reasonableness of the discount rates used for each reporting unit, management compares the discount rate to the estimated cost of equity for publicly traded institutions with similar businesses and risk characteristics. In addition, the weighted average cost of equity (aggregating the various reporting units) is compared with the Firm's overall estimated cost of equity to ensure reasonableness. The valuations derived from the discounted cash flow analysis are then compared with market-based trading and transaction multiples for relevant competitors. Trading and transaction comparables are used as general indicators to assess the overall reasonableness of the estimated fair values, although precise conclusions generally cannot be drawn due to the differences that naturally exist between the Firm's businesses and competitor institutions.

Management also takes into consideration a comparison between the aggregate fair values of the Firm's reporting units and JPMorgan Chase's market capitalization. In evaluating this comparison, management considers several factors, including (i) a control premium that would exist in a market transaction, (ii) factors related to the level of execution risk that would exist at the Firmwide level that do not exist at the reporting unit level and (iii) short-term market volatility and other factors that do not directly affect the value of individual reporting units.

Unanticipated declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of the Firm's reporting units to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Firm has elected to account for its MSRs at fair value. The Firm treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Firm estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Firm's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Firm compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), and certain derivatives (e.g., those for which the Firm receives fixed-rate interest payments) increase in value when interest rates decline. JPMorgan Chase uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2021, 2020 and 2019.

As of or for the year ended December 31, (in millions, except where otherwise noted)		2021		2020		2019
Fair value at beginning of period	$	**3,276**	$	4,699	$	6,130
MSR activity:						
Originations of MSRs		**1,659**		944		1,384
Purchase of MSRs		**1,363**		248		105
Disposition of MSRs[(a)]		**(114)**		(176)		(789)
Net additions/(dispositions)		**2,908**		1,016		700
Changes due to collection/realization of expected cash flows		**(788)**		(899)		(951)
Changes in valuation due to inputs and assumptions:						
Changes due to market interest rates and other[(b)]		**404**		(1,568)		(893)
Changes in valuation due to other inputs and assumptions:						
Projected cash flows (e.g., cost to service)		**109**		(54)		(333) [(e)]
Discount rates		**–**		199		153
Prepayment model changes and other[(c)]		**(415)**		(117)		(107)
Total changes in valuation due to other inputs and assumptions		**(306)**		28		(287)
Total changes in valuation due to inputs and assumptions		**98**		(1,540)		(1,180)
Fair value at December 31,	$	**5,494**	$	3,276	$	4,699
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	$	**98**	$	(1,540)	$	(1,180)
Contractual service fees, late fees and other ancillary fees included in income		**1,298**		1,325		1,639
Third-party mortgage loans serviced at December 31, (in billions)		**520**		448		522
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions)[(d)]		**1.6**		1.8		2.0

(a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities ("SMBS") for the years ended December 31, 2020 and 2019. In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Firm acquired the remaining balance of those SMBS as trading securities.
(b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(c) Represents changes in prepayments other than those attributable to changes in market interest rates.
(d) Represents amounts the Firm pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Firm's credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Firm maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.
(e) The decrease in projected cash flows was largely related to default servicing assumption updates.

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021	2020	2019
CCB mortgage fees and related income			
Production revenue	**$ 2,215**	$ 2,629	$ 1,618
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	**1,257**	1,367	1,533
Changes in MSR asset fair value due to collection/realization of expected cash flows	**(788)**	(899)	(951)
Total operating revenue	**469**	468	582
Risk management:			
Changes in MSR asset fair value due to market interest rates and other[(a)]	**404**	(1,568)	(893)
Other changes in MSR asset fair value due to other inputs and assumptions in model[(b)]	**(306)**	28	(287)
Change in derivative fair value and other	**(623)**	1,522	1,015
Total risk management	**(525)**	(18)	(165)
Total net mortgage servicing revenue	**(56)**	450	417
Total CCB mortgage fees and related income	**2,159**	3,079	2,035
All other	**11**	12	1
Mortgage fees and related income	**$ 2,170**	$ 3,091	$ 2,036

(a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

The table below outlines the key economic assumptions used to determine the fair value of the Firm's MSRs at December 31, 2021 and 2020, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2021	2020
Weighted-average prepayment speed assumption (constant prepayment rate)	**9.90 %**	14.90 %
Impact on fair value of 10% adverse change	**$ (210)**	$ (206)
Impact on fair value of 20% adverse change	**(404)**	(392)
Weighted-average option adjusted spread[(a)]	**6.44 %**	7.19 %
Impact on fair value of 100 basis points adverse change	**$ (225)**	$ (134)
Impact on fair value of 200 basis points adverse change	**(433)**	(258)

(a) Includes the impact of operational risk and regulatory capital.

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

Note 16 – Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. JPMorgan Chase computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, the Firm uses the straight-line method computed over the lesser of the remainder of the lease term, or estimated useful life of the improvements.

JPMorgan Chase capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

Note 17 – Deposits

At December 31, 2021 and 2020, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2021	2020
U.S. offices		
Noninterest-bearing (included **$8,115** and $9,873 at fair value)[a]	**$ 638,879**	$ 572,711
Interest-bearing (included **$629** and $2,567 at fair value)[a]	**1,432,578**	1,197,032
Total deposits in U.S. offices	**2,071,457**	1,769,743
Non-U.S. offices		
Noninterest-bearing (included **$2,420** and $1,486 at fair value)[a]	**26,229**	23,435
Interest-bearing (included **$169** and $558 at fair value)[a]	**364,617**	351,079
Total deposits in non-U.S. offices	**390,846**	374,514
Total deposits	**$ 2,462,303**	$2,144,257

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 3 for further discussion.

At December 31, 2021 and 2020, time deposits in denominations that met or exceeded the insured limit were as follows.

December 31, (in millions)	2021	2020
U.S. offices	**$ 38,970**	$ 33,812
Non-U.S. offices [a]	**54,535**	50,776 [b]
Total	**$ 93,505**	$ 84,588

(a) Represents all time deposits in non-U.S.offices as these deposits typically exceed the insured limit.
(b) Prior-period amount has been revised to conform with the current presentation.

At December 31, 2021, the maturities of interest-bearing time deposits were as follows.

December 31, 2021 (in millions)	U.S.	Non-U.S.	Total
2022	$ 47,595	$ 50,805	$ 98,400
2023	771	308	1,079
2024	269	10	279
2025	202	38	240
2026	169	821	990
After 5 years	484	132	616
Total	$ 49,490	$ 52,114	$ 101,604

Note 18 - Leases

Firm as lessee

At December 31, 2021, JPMorgan Chase and its subsidiaries were obligated under a number of noncancellable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Firm is reasonably certain that it will exercise those options. All leases with lease terms greater than twelve months are reported as a lease liability with a corresponding right-of-use ("ROU") asset. None of these lease agreements impose restrictions on the Firm's ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements. Certain of these leases contain escalation clauses that will increase rental payments based on maintenance, utility and tax increases, which are non-lease components. The Firm elected not to separate lease and non-lease components of a contract for its real estate leases. As such, real estate lease payments represent payments on both lease and non-lease components.

Operating lease liabilities and ROU assets are recognized at the lease commencement date based on the present value of the future minimum lease payments over the lease term. The future lease payments are discounted at a rate that represents the Firm's collateralized borrowing rate for financing instruments of a similar term and are included in accounts payable and other liabilities. The operating lease ROU asset, included in premises and equipment, also includes any lease prepayments made, plus initial direct costs incurred, less any lease incentives received. Rental expense associated with operating leases is recognized on a straight-line basis over the lease term, and generally included in occupancy expense in the Consolidated statements of income.

The following tables provide information related to the Firm's operating leases:

December 31, (in millions, except where otherwise noted)	2021	2020
Right-of-use assets	**$ 7,888**	$ 8,006
Lease liabilities	**8,328**	8,508
Weighted average remaining lease term (in years)	**8.5**	8.7
Weighted average discount rate	**3.40 %**	3.48 %
Supplemental cash flow information		
Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	**$ 1,656**	$ 1,626
Supplemental non-cash information		
Right-of-use assets obtained in exchange for operating lease obligations	**$ 1,167**	$ 1,350

Year ended December 31, (in millions)	2021	2020
Rental expense		
Gross rental expense	**$ 2,086**	$ 2,094
Sublease rental income	**(129)**	(166)
Net rental expense	**$ 1,957**	$ 1,928

The following table presents future payments under operating leases as of December 31, 2021:

Year ended December 31, (in millions)	
2022	$ 1,572
2023	1,435
2024	1,285
2025	1,115
2026	862
After 2026	3,453
Total future minimum lease payments	9,722
Less: Imputed interest	(1,394)
Total	$ 8,328

In addition to the table above, as of December 31, 2021, the Firm had additional future operating lease commitments of $0.9 billion that were signed but had not yet commenced. These operating leases will commence between 2022 and 2023 with lease terms up to 22 years.

Firm as lessor

The Firm provides auto and equipment lease financing to its customers through lease arrangements with lease terms that may contain renewal, termination and/or purchase options. The Firm's lease financings are predominantly auto operating leases. These assets subject to operating leases are recognized in other assets on the Firm's Consolidated balance sheets and are depreciated on a straight-line basis over the lease term to reduce the asset to its estimated residual value. Depreciation expense is included in technology, communications and equipment expense in the Consolidated statements of income. The Firm's lease income is generally recognized on a straight-line basis over the lease term and is included in other income in the Consolidated statements of income.

On a periodic basis, the Firm assesses leased assets for impairment, and if the carrying amount of the leased asset exceeds the undiscounted cash flows from the lease payments and the estimated residual value upon disposition of the leased asset, an impairment loss is recognized.

The risk of loss on auto and equipment leased assets relating to the residual value of the leased assets is monitored through projections of the asset residual values at lease origination and periodic review of residual values, and is mitigated through arrangements with certain manufacturers or lessees.

The following table presents the carrying value of assets subject to leases reported on the Consolidated balance sheets:

December 31, (in millions)	2021	2020
Carrying value of assets subject to operating leases, net of accumulated depreciation	**$ 17,553**	$ 21,155
Accumulated depreciation	**5,737**	6,388

The following table presents the Firm's operating lease income and the related depreciation expense on the Consolidated statements of income:

Year ended December 31, (in millions)	2021	2020	2019
Operating lease income	**$ 4,914**	$ 5,539	$ 5,455
Depreciation expense	**3,380**	4,257	4,157

The following table presents future receipts under operating leases as of December 31, 2021:

Year ended December 31, (in millions)	
2022	$ 2,984
2023	1,674
2024	559
2025	48
2026	43
After 2026	–
Total future minimum lease receipts	$ 5,308

Note 19 – Accounts payable and other liabilities

Accounts payable and other liabilities consist of brokerage payables, which include payables to customers and payables related to security purchases that did not settle, as well as other accrued expenses, such as credit card rewards liability, operating lease liabilities, income tax payables, and litigation reserves.

The following table details the components of accounts payable and other liabilities.

December 31, (in millions)	2021	2020
Brokerage payables	**$ 169,172**	$ 140,291
Other payables and liabilities[(a)(b)]	**93,583**	90,994
Total accounts payable and other liabilities	**$ 262,755**	$ 231,285

(a) Includes credit card rewards liability of $9.8 billion and $7.7 billion at December 31, 2021 and 2020, respectively.
(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Note 20 – Long-term debt

JPMorgan Chase issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Firm has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2021.

By remaining maturity at December 31, (in millions, except rates)		2021				2020
		Under 1 year	1-5 years	After 5 years	**Total**	Total
Parent company						
Senior debt:	Fixed rate	$ **9,900**	$ **71,001**	$ **121,469**	$ **202,370**	$ 180,208 [h]
	Variable rate	**845**	**9,106**	**3,392**	**13,343**	11,877 [h]
	Interest rates[a]	**2.93 %**	**2.22 %**	**3.00 %**	**2.67 %**	2.97 %
Subordinated debt:	Fixed rate	$ **–**	$ **8,168**	$ **10,101**	$ **18,269**	$ 19,255
	Variable rate	**–**	**–**	**–**	**–**	9
	Interest rates[a]	**– %**	**4.21 %**	**4.28 %**	**4.24 %**	4.24 %
	Subtotal	$ **10,745**	$ **88,275**	$ **134,962**	$ **233,982**	$ 211,349
Subsidiaries						
Federal Home Loan Banks advances:	Fixed rate	$ **8**	$ **45**	$ **57**	$ **110**	$ 123
	Variable rate	**–**	**11,000**	**–**	**11,000**	14,000
	Interest rates[a]	**5.53 %**	**0.19 %**	**6.14 %**	**0.23 %**	0.34 %
Senior debt:	Fixed rate	$ **775**	$ **4,701**	$ **10,028**	$ **15,504**	$ 16,227 [h]
	Variable rate	**11,248**	**19,896**	**7,003**	**38,147**	37,642 [h]
	Interest rates[a]	**4.55 %**	**4.92%**	**1.64 %**	**2.09 %**	2.28 %
Subordinated debt:	Fixed rate	$ **–**	$ **287**	$ **–**	$ **287**	$ 309
	Variable rate	**–**	**–**	**–**	**–**	–
	Interest rates[a]	**– %**	**8.25 %**	**– %**	**8.25 %**	8.25 %
	Subtotal	$ **12,031**	$ **35,929**	$ **17,088**	$ **65,048**	$ 68,301
Junior subordinated debt:	Fixed rate	$ **–**	$ **–**	$ **678**	$ **678**	$ 738
	Variable rate	**–**	**–**	**1,297**	**1,297**	1,297
	Interest rates[a]	**– %**	**– %**	**3.20 %**	**3.20 %**	3.26 %
	Subtotal	$ **–**	$ **–**	$ **1,975**	$ **1,975**	$ 2,035
Total long-term debt[b][c][d]		$ **22,776**	$ **124,204**	$ **154,025**	$ **301,005** [f][g]	$ 281,685
Long-term beneficial interests:	Fixed rate	$ **748**	$ **999**	$ **–**	$ **1,747**	$ 2,369
	Variable rate	**650**	**–**	**179**	**829**	2,784
	Interest rates[a]	**1.39 %**	**1.53 %**	**3.24 %**	**1.57 %**	1.30 %
Total long-term beneficial interests[e]		$ **1,398**	$ **999**	$ **179**	$ **2,576**	$ 5,153

(a) The interest rates shown are the weighted average of contractual rates in effect at December 31, 2021 and 2020, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The interest rates shown exclude structured notes accounted for at fair value.

(b) Included long-term debt of $14.1 billion and $17.2 billion secured by assets totaling $170.6 billion and $166.4 billion at December 31, 2021 and 2020, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.

(c) Included $74.9 billion and $76.8 billion of long-term debt accounted for at fair value at December 31, 2021 and 2020, respectively.

(d) Included $15.8 billion and $16.1 billion of outstanding zero-coupon notes at December 31, 2021 and 2020, respectively. The aggregate principal amount of these notes at their respective maturities is $46.4 billion and $45.3 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Firm's next call date, if applicable.

(e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Also included $12 million and $41 million accounted for at fair value at December 31, 2021 and 2020, respectively. Excluded short-term commercial paper and other short-term beneficial interests of $8.2 billion and $12.4 billion at December 31, 2021 and 2020, respectively.

(f) At December 31, 2021, long-term debt in the aggregate of $185.0 billion was redeemable at the option of JPMorgan Chase, in whole or in part, prior to maturity, based on the terms specified in the respective instruments.

(g) The aggregate carrying values of debt that matures in each of the five years subsequent to 2021 is $22.8 billion in 2022, $32.6 billion in 2023, $36.4 billion in 2024, $26.1 billion in 2025 and $29.1 billion in 2026.

(h) Prior-period amounts have been revised to conform with the current presentation.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 2.67% and 2.89% as of December 31, 2021 and 2020, respectively. In order to modify exposure to interest rate and currency exchange rate movements, JPMorgan Chase utilizes derivative instruments, primarily interest rate and cross-currency interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Firm's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 1.43% and 1.59% as of December 31, 2021 and 2020, respectively.

JPMorgan Chase & Co. has guaranteed certain long-term debt of its subsidiaries, including structured notes. These guarantees rank on parity with the Firm's other unsecured and unsubordinated indebtedness. The amount of such guaranteed long-term debt and structured notes was $16.4 billion and $13.8 billion at December 31, 2021 and 2020, respectively.

The Firm's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings or stock price.

Note 21 – Preferred stock

At December 31, 2021 and 2020, JPMorgan Chase was authorized to issue 200 million shares of preferred stock, in one or more series, with a par value of $1 per share. In the event of a liquidation or dissolution of the Firm, JPMorgan Chase's preferred stock then outstanding takes precedence over the Firm's common stock with respect to the payment of dividends and the distribution of assets.

The following is a summary of JPMorgan Chase's non-cumulative preferred stock outstanding as of December 31, 2021 and 2020.

	Shares[a]		Carrying value (in millions)						Dividend declared per share[d]			
	December 31,		December 31,						Year ended December 31,			
	2021	2020	2021	2020	Issue date	Contractual rate in effect at December 31, 2021	Earliest redemption date[b]	Floating annualized rate[c]	2021	2020	2019	
Fixed-rate:												
Series P	–	–	$ –	$ –	2/5/2013	– %	3/1/2018	NA	$–	$–	$545.00	
Series T	–	–	–	–	1/30/2014	–	3/1/2019	NA	–	–	167.50	
Series W	–	–	–	–	6/23/2014	–	9/1/2019	NA	–	–	472.50	
Series Y	–	–	–	–	2/12/2015	–	3/1/2020	NA	–	153.13	612.52	
Series AA	–	142,500	–	1,425	6/4/2015	–	9/1/2020	NA	**305.00**	610.00	610.00	
Series BB	–	115,000	–	1,150	7/29/2015	–	9/1/2020	NA	**307.50**	615.00	615.00	
Series DD	**169,625**	169,625	**1,696**	1,696	9/21/2018	**5.750**	12/1/2023	NA	**575.00**	575.00	575.00	
Series EE	**185,000**	185,000	**1,850**	1,850	1/24/2019	**6.000**	3/1/2024	NA	**600.00**	600.00	511.67	(e)
Series GG	**90,000**	90,000	**900**	900	11/7/2019	**4.750**	12/1/2024	NA	**475.00**	506.67	NA	(e)
Series JJ	**150,000**	–	**1,500**	–	3/17/2021	**4.550**	6/1/2026	NA	**321.03**	NA	NA	(e)
Series LL	**185,000**	–	**1,850**	–	5/20/2021	**4.625**	6/1/2026	NA	**245.39**	NA	NA	(e)
Series MM	**200,000**	–	**2,000**	–	7/29/2021	**4.200**	9/1/2026	NA	**142.33**	NA	NA	(e)
Fixed-to-floating-rate:												
Series I	**293,375**	293,375	**$ 2,934**	$ 2,934	4/23/2008	**LIBOR + 3.47%**	4/30/2018	LIBOR + 3.47%	**$370.38**	$428.03	$593.23	
Series Q	**150,000**	150,000	**1,500**	1,500	4/23/2013	**5.150**	5/1/2023	LIBOR + 3.25	**515.00**	515.00	515.00	
Series R	**150,000**	150,000	**1,500**	1,500	7/29/2013	**6.000**	8/1/2023	LIBOR + 3.30	**600.00**	600.00	600.00	
Series S	**200,000**	200,000	**2,000**	2,000	1/22/2014	**6.750**	2/1/2024	LIBOR + 3.78	**675.00**	675.00	675.00	
Series U	**100,000**	100,000	**1,000**	1,000	3/10/2014	**6.125**	4/30/2024	LIBOR + 3.33	**612.50**	612.50	612.50	
Series V	**250,000**	250,000	**2,500**	2,500	6/9/2014	**LIBOR + 3.32%**	7/1/2019	LIBOR + 3.32	**353.65**	436.85	534.09	(f)
Series X	**160,000**	160,000	**1,600**	1,600	9/23/2014	**6.100**	10/1/2024	LIBOR + 3.33	**610.00**	610.00	610.00	
Series Z	**200,000**	200,000	**2,000**	2,000	4/21/2015	**LIBOR + 3.80%**	5/1/2020	LIBOR + 3.80	**401.44**	453.52	530.00	(g)
Series CC	**125,750**	125,750	**1,258**	1,258	10/20/2017	**4.625**	11/1/2022	LIBOR + 2.58	**462.50**	462.50	462.50	
Series FF	**225,000**	225,000	**2,250**	2,250	7/31/2019	**5.000**	8/1/2024	SOFR + 3.38	**500.00**	500.00	251.39	(e)
Series HH	**300,000**	300,000	**3,000**	3,000	1/23/2020	**4.600**	2/1/2025	SOFR + 3.125	**460.00**	470.22	NA	(e)
Series II	**150,000**	150,000	**1,500**	1,500	2/24/2020	**4.000**	4/1/2025	SOFR + 2.745	**400.00**	341.11	NA	(e)
Series KK	**200,000**	–	**2,000**	–	5/12/2021	**3.650**	6/1/2026	CMT + 2.85	**201.76**	NA	NA	(e)
Total preferred stock	**3,483,750**	3,006,250	**$ 34,838**	$ 30,063								

(a) Represented by depositary shares.
(b) Fixed-to-floating rate notes convert to a floating rate at the earliest redemption date.
(c) Floating annualized rate includes three-month LIBOR, three-month term SOFR or five-year Constant Maturity Treasury ("CMT") rate, as applicable, plus the spreads noted above.
(d) Dividends are declared quarterly. Dividends are payable quarterly on fixed-rate preferred stock. Dividends are payable semiannually on fixed-to-floating-rate preferred stock while at a fixed rate, and payable quarterly after converting to a floating rate.
(e) The initial dividend declared is prorated based on the number of days outstanding for the period. Dividends were declared quarterly thereafter at the contractual rate.
(f) The dividend rate for Series V preferred stock became floating and payable quarterly starting on July 1, 2019; prior to which the dividend rate was fixed at 5% or $250.00 per share payable semi annually.
(g) The dividend rate for Series Z preferred stock became floating and payable quarterly starting on May 1, 2020; prior to which the dividend rate was fixed at 5.3% or $265.00 per share payable semi annually.

Each series of preferred stock has a liquidation value and redemption price per share of $10,000, plus accrued but unpaid dividends. The aggregate liquidation value was $35.2 billion at December 31, 2021.

Redemptions

On February 1, 2022, the Firm redeemed all $2.0 billion of its fixed-to-floating rate non-cumulative preferred stock, Series Z.

On June 1, 2021, the Firm redeemed all $1.43 billion of its 6.10% non-cumulative preferred stock, Series AA and all $1.15 billion of its 6.15% non-cumulative preferred stock, Series BB.

On March 1, 2020, the Firm redeemed all $1.43 billion of its 6.125% non-cumulative preferred stock, Series Y.

Redemption rights

Each series of the Firm’s preferred stock may be redeemed on any dividend payment date on or after the earliest redemption date for that series. All outstanding preferred stock series except Series I may also be redeemed following a “capital treatment event,” as described in the terms of each series. Any redemption of the Firm’s preferred stock is subject to non-objection from the Board of Governors of the Federal Reserve System (the “Federal Reserve”).

Note 22 – Common stock

At December 31, 2021 and 2020, JPMorgan Chase was authorized to issue 9.0 billion shares of common stock with a par value of $1 per share.

Common shares issued (reissuances from treasury) by JPMorgan Chase during the years ended December 31, 2021, 2020 and 2019 were as follows.

Year ended December 31, (in millions)	2021	2020	2019
Total issued – balance at January 1	**4,104.9**	4,104.9	4,104.9
Treasury – balance at January 1	**(1,055.5)**	(1,020.9)	(829.1)
Repurchase	**(119.7)**	(50.0)	(213.0)
Reissuance:			
Employee benefits and compensation plans	**13.5**	14.2	20.4
Employee stock purchase plans	**0.9**	1.2	0.8
Total reissuance	**14.4**	15.4	21.2
Total treasury – balance at December 31	**(1,160.8)**	(1,055.5)	(1,020.9)
Outstanding at December 31	**2,944.1**	3,049.4	3,084.0

On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. Subsequently, the Firm announced that its Board of Directors authorized a new common share repurchase program for up to $30 billion. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first and second quarters of 2021 were restricted and could not exceed the average of the Firm's net income for the four preceding calendar quarters.

On June 24, 2021, the Federal Reserve announced that the temporary restrictions on capital distributions would expire on June 30, 2021 as a result of the Firm remaining above its minimum risk-based capital requirements under the 2021 CCAR stress test. Effective July 1, 2021, the Firm became subject to the normal capital distribution restrictions provided under the regulatory capital framework. The Firm continues to be authorized to repurchase common shares under its existing common share repurchase program previously approved by the Board of Directors.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions)	2021	2020[(a)]	2019
Total number of shares of common stock repurchased	**119.7**	50.0	213.0
Aggregate purchase price of common stock repurchases	**$18,448**	$ 6,397	$24,121

(a) On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020.

The authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares –for example, during internal trading blackout periods.

As of December 31, 2021, approximately 58.3 million shares of common stock were reserved for issuance under various employee incentive, compensation, option and stock purchase plans, and directors' compensation plans.

Note 23 – Earnings per share

Basic earnings per share ("EPS") is calculated using the two-class method. Under the two-class method, all earnings (distributed and undistributed) are allocated to common stock and participating securities. JPMorgan Chase grants RSUs under its share-based compensation programs, predominantly all of which entitle recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to dividends paid to holders of the Firm's common stock. These unvested RSUs meet the definition of participating securities based on their respective rights to receive nonforfeitable dividends, and they are treated as a separate class of securities in computing basic EPS. Participating securities are not included as incremental shares in computing diluted EPS; refer to Note 9 for additional information.

Diluted EPS incorporates the potential impact of contingently issuable shares, including awards which require future service as a condition of delivery of the underlying common stock. Diluted EPS is calculated under both the two-class and treasury stock methods, and the more dilutive amount is reported. For each of the periods presented in the table below, diluted EPS calculated under the two-class method was more dilutive.

The following table presents the calculation of net income applicable to common stockholders and basic and diluted EPS for the years ended December 31, 2021, 2020 and 2019.

Year ended December 31, (in millions, except per share amounts)	2021	2020	2019
Basic earnings per share			
Net income	**$ 48,334**	$ 29,131	$ 36,431
Less: Preferred stock dividends	**1,600**	1,583	1,587
Net income applicable to common equity	**46,734**	27,548	34,844
Less: Dividends and undistributed earnings allocated to participating securities	**231**	138	202
Net income applicable to common stockholders	**$ 46,503**	$ 27,410	$ 34,642
Total weighted-average basic shares outstanding	**3,021.5**	3,082.4	3,221.5
Net income per share	**$ 15.39**	$ 8.89	$ 10.75
Diluted earnings per share			
Net income applicable to common stockholders	**$ 46,503**	$ 27,410	$ 34,642
Total weighted-average basic shares outstanding	**3,021.5**	3,082.4	3,221.5
Add: Dilutive impact of SARs and employee stock options, unvested PSUs and nondividend-earning RSUs, and warrants	**5.1**	5.0	8.9
Total weighted-average diluted shares outstanding	**3,026.6**	3,087.4	3,230.4
Net income per share	**$ 15.36**	$ 8.88	$ 10.72

Note 24 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), fair value changes of excluded components on fair value hedges, cash flow hedging activities, net loss and prior service costs/(credit) related to the Firm's defined benefit pension and OPEB plans, and fair value option-elected liabilities arising from changes in the Firm's own credit risk (DVA).

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of hedges	Fair value hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2018	$ 1,202	$ (727)	$ (161)	$ (109)	$ (2,308)	$ 596	$ (1,507)
Net change	2,855	20	30	172	964	(965)	3,076
Balance at December 31, 2019	$ 4,057	$ (707)	$ (131)	$ 63	$ (1,344)	$ (369)	$ 1,569
Net change	4,123	234	19	2,320	212	(491)	6,417
Balance at December 31, 2020	$ 8,180	$ (473)	$ (112)	$ 2,383	$ (1,132)	$ (860)	$ 7,986
Net change	(5,540)	(461)	(19)	(2,679)	922	(293)	(8,070)
Balance at December 31, 2021	**$ 2,640** [(a)]	**$ (934)**	**$ (131)**	**$ (296)**	**$ (210)**	**$ (1,153)**	**$ (84)**

(a) Includes after-tax net unamortized unrealized gains of $2.4 billion related to AFS securities that have been transferred to HTM. Refer to Note 10 for further information.

The following table presents the pre-tax and after-tax changes in the components of OCI.

	2021			2020			2019		
Year ended December 31, (in millions)	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax
Unrealized gains/(losses) on investment securities:									
Net unrealized gains/(losses) arising during the period	**$ (7,634)**	**$ 1,832**	**$ (5,802)**	$ 6,228	$ (1,495)	$ 4,733	$ 4,025	$ (974)	$ 3,051
Reclassification adjustment for realized (gains)/losses included in net income[(a)]	**345**	**(83)**	**262**	(802)	192	(610)	(258)	62	(196)
Net change	**(7,289)**	**1,749**	**(5,540)**	5,426	(1,303)	4,123	3,767	(912)	2,855
Translation adjustments[(b)]:									
Translation	**(2,447)**	**125**	**(2,322)**	1,407	(103)	1,304	(49)	33	(16)
Hedges	**2,452**	**(591)**	**1,861**	(1,411)	341	(1,070)	46	(10)	36
Net change	**5**	**(466)**	**(461)**	(4)	238	234	(3)	23	20
Fair value hedges, net change[(c)]:	**(26)**	**7**	**(19)**	25	(6)	19	39	(9)	30
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	**(2,303)**	**553**	**(1,750)**	3,623	(870)	2,753	122	(28)	94
Reclassification adjustment for realized (gains)/losses included in net income[(d)]	**(1,222)**	**293**	**(929)**	(570)	137	(433)	103	(25)	78
Net change	**(3,525)**	**846**	**(2,679)**	3,053	(733)	2,320	225	(53)	172
Defined benefit pension and OPEB plans, net change:	**1,129**	**(207)**	**922**	214	(2)	212	1,157	(193)	964
DVA on fair value option elected liabilities, net change:	**(393)**	**100**	**(293)**	(648)	157	(491)	(1,264)	299	(965)
Total other comprehensive income/(loss)	**$(10,099)**	**$ 2,029**	**$ (8,070)**	$ 8,066	$ (1,649)	$ 6,417	$ 3,921	$ (845)	$ 3,076

(a) The pre-tax amount is reported in Investment securities gains/(losses) in the Consolidated statements of income.
(b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. During the year ended December 31, 2021, the Firm reclassified a net pre-tax loss of $7 million to other expense related to the liquidation of certain legal entities, driven by cumulative translation adjustments. During the year ended December 31, 2020, the Firm reclassified a net pre-tax gain of $6 million to other income related to the liquidation of legal entities, $3 million related to net investment hedge gains and $3 million related to cumulative translation adjustments. During the year ended December 31, 2019, the Firm reclassified net pre-tax gains of $7 million to other income and $1 million to other expense, respectively. These amounts, which related to the liquidation of certain legal entities, are comprised of $18 million related to net investment hedge gains and $10 million related to cumulative translation adjustments.
(c) Represents changes in fair value of cross-currency swaps attributable to changes in cross-currency basis spreads, which are excluded from the assessment of hedge effectiveness and recorded in other comprehensive income. The initial cost of cross-currency basis spreads is recognized in earnings as part of the accrual of interest on the cross-currency swap.
(d) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.

Note 25 – Income taxes

JPMorgan Chase and its eligible subsidiaries file a consolidated U.S. federal income tax return. JPMorgan Chase uses the asset and liability method to provide income taxes on all transactions recorded in the Consolidated Financial Statements. This method requires that income taxes reflect the expected future tax consequences of temporary differences between the carrying amounts of assets or liabilities for book and tax purposes. Accordingly, a deferred tax asset or liability for each temporary difference is determined based on the tax rates that the Firm expects to be in effect when the underlying items of income and expense are realized. JPMorgan Chase's expense for income taxes includes the current and deferred portions of that expense. A valuation allowance is established to reduce deferred tax assets to the amount the Firm expects to realize.

Due to the inherent complexities arising from the nature of the Firm's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between JPMorgan Chase and the many tax jurisdictions in which the Firm files tax returns may not be finalized for several years. Thus, the Firm's final tax-related assets and liabilities may ultimately be different from those currently reported.

In the first quarter of 2021, the Firm reclassified certain deferred investment tax credits from accounts payable and other liabilities to other assets to be a reduction to the carrying value of the associated tax-oriented investments. The reclassification also resulted in an increase in income tax expense and a corresponding increase in other income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation, including the Firm's effective income tax rate.

Effective tax rate and expense

The following table presents a reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate.

Effective tax rate

Year ended December 31,	2021	2020	2019
Statutory U.S. federal tax rate	**21.0 %**	21.0 %	21.0 %
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**3.0**	2.5	3.5
Tax-exempt income	**(0.9)**	(1.6)	(1.4)
Non-U.S. earnings	**0.1**	1.4	1.8
Business tax credits	**(4.2)**	(5.4) [a]	(3.8) [a]
Tax audit resolutions	**–**	–	(2.3)
Other, net	**(0.1)**	0.8 [a]	–
Effective tax rate	**18.9 %**	18.7 %	18.8 %

(a) Prior-period amounts have been revised to conform with the current presentation.

The following table reflects the components of income tax expense/(benefit) included in the Consolidated statements of income.

Income tax expense/(benefit)

Year ended December 31, (in millions)	2021	2020	2019
Current income tax expense/(benefit)			
U.S. federal	**$ 2,865**	$5,759	$ 3,284
Non-U.S.	**2,718**	2,705	2,103
U.S. state and local	**1,897**	1,793	1,778
Total current income tax expense/(benefit)	**7,480**	10,257	7,165
Deferred income tax expense/(benefit)			
U.S. federal	**3,460**	(2,776) [a]	1,030 [a]
Non-U.S.	**(101)**	(126)	20
U.S. state and local	**389**	(671)	220
Total deferred income tax expense/(benefit)	**3,748**	(3,573)	1,270
Total income tax expense	**$11,228**	$6,684	$ 8,435

(a) Prior-period amount has been revised to conform with the current presentation.

Total income tax expense includes $69 million tax expense, and $72 million and $1.1 billion of tax benefits recorded in 2021, 2020, and 2019, respectively, resulting from the resolution of tax audits.

Tax effect of items recorded in stockholders' equity

The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholders' equity. The tax effect of all items recorded directly to stockholders' equity resulted in an increase of $2.0 billion in 2021 and decreases of $827 million and $862 million in 2020 and 2019, respectively.

Results from non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense.

Year ended December 31, (in millions)	2021	2020	2019
U.S.	**$50,126**	$27,312 [b]	$ 36,991 [b]
Non-U.S.[a]	**9,436**	8,503	7,875
Income before income tax expense	**$59,562**	$35,815	$ 44,866

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.
(b) Prior-period amount has been revised to conform with the current presentation.

The Firm will recognize any U.S. income tax expense it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred.

Affordable housing tax credits

The Firm recognized $1.7 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the year ended 2021, and $1.5 billion in each of the years ended 2020 and 2019. The amount of amortization of such investments reported in income tax expense was $1.3 billion, $1.2 billion and $1.1 billion, respectively. The carrying value of these investments, which are reported in other assets on the Firm's Consolidated balance sheets, was $10.8 billion and $9.7 billion at December 31, 2021 and 2020, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Firm's Consolidated balance sheets, was $4.6 billion and $3.8 billion at December 31, 2021 and 2020, respectively.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table.

December 31, (in millions)	2021	2020
Deferred tax assets		
Allowance for loan losses	**$ 4,345**	$ 7,270
Employee benefits	**987**	1,104
Accrued expenses and other	**3,955**	3,332
Non-U.S. operations	**900**	849
Tax attribute carryforwards	**615**	757
Gross deferred tax assets	**10,802**	13,312
Valuation allowance	**(378)**	(560)
Deferred tax assets, net of valuation allowance	**$ 10,424**	$ 12,752
Deferred tax liabilities		
Depreciation and amortization	**$ 3,289**	$ 3,329
Mortgage servicing rights, net of hedges	**2,049**	2,184
Leasing transactions	**4,227**	5,124
Other, net	**4,459**	6,025
Gross deferred tax liabilities	**14,024**	16,662
Net deferred tax (liabilities)/assets	**$ (3,600)**	$ (3,910)

JPMorgan Chase has recorded deferred tax assets of $615 million at December 31, 2021, in connection with U.S. federal and non-U.S. NOL carryforwards and other tax attributes, FTC carryforwards, and state and local capital loss carryforwards. At December 31, 2021, total U.S. federal NOL carryforwards were $972 million, non-U.S. NOL carryforwards were $210 million, FTC carryforwards were $258 million, state and local capital loss carryforwards were $1.1 billion, and other U.S. federal tax attributes were $359 million. If not utilized, a portion of the U.S. federal NOL carryforwards and other U.S. federal tax attributes will expire between 2026 and 2037 whereas others have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2026 and 2036 whereas others have an unlimited carryforward period. The FTC carryforwards will expire between 2029 and 2030, and the state and local capital loss carryforwards will expire in 2022.

The valuation allowance at December 31, 2021, was due to the state and local capital loss carryforwards, FTC carryforwards, and certain non-U.S. deferred tax assets, including NOL carryforwards.

Unrecognized tax benefits

At December 31, 2021, 2020 and 2019, JPMorgan Chase's unrecognized tax benefits, excluding related interest expense and penalties, were $4.6 billion, $4.3 billion and $4.0 billion, respectively, of which $3.4 billion, $3.1 billion and $2.8 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below. As JPMorgan Chase is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as approximately $300 million. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits.

Year ended December 31, (in millions)	**2021**	2020	2019
Balance at January 1,	**$ 4,250**	$ 4,024	$ 4,861
Increases based on tax positions related to the current period	**798**	685	871
Increases based on tax positions related to prior periods	**393**	362	10
Decreases based on tax positions related to prior periods	**(657)**	(705)	(706)
Decreases related to cash settlements with taxing authorities	**(148)**	(116)	(1,012)
Balance at December 31,	**$ 4,636**	$ 4,250	$ 4,024

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $174 million, $147 million and $(52) million in 2021, 2020 and 2019, respectively.

At December 31, 2021 and 2020, in addition to the liability for unrecognized tax benefits, the Firm had accrued $1.1 billion and $1.0 billion, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2021.

	Periods under examination	Status
JPMorgan Chase – U.S.	2011 – 2013	Field examination of amended returns
JPMorgan Chase – U.S.	2014 - 2018	Field Examination
JPMorgan Chase – New York State	2012 - 2014	Field Examination
JPMorgan Chase – New York City	2015 - 2017	Field Examination
JPMorgan Chase – California	2011 - 2012	Field Examination
JPMorgan Chase – U.K.	2006 – 2019	Field examination of certain select entities

Note 26 – Restricted cash, other restricted assets and intercompany funds transfers

Restricted cash and other restricted assets

Certain of the Firm's cash and other assets are restricted as to withdrawal or usage. These restrictions are imposed by various regulatory authorities based on the particular activities of the Firm's subsidiaries.

The business of JPMorgan Chase Bank, N.A. is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Firm is required to maintain cash reserves at certain non-US central banks.

The Firm is also subject to rules and regulations established by other U.S. and non U.S. regulators. As part of its compliance with the respective regulatory requirements, the Firm's broker-dealer activities are subject to certain restrictions on cash and other assets.

The following table presents the components of the Firm's restricted cash:

December 31, (in billions)	2021	2020
Segregated for the benefit of securities and cleared derivative customers	**14.6**	19.3
Cash reserves at non-U.S. central banks and held for other general purposes	**5.1**	5.1
Total restricted cash[(a)]	**$ 19.7**	$ 24.4

(a) Comprises $18.4 billion and $22.7 billion in deposits with banks, and $1.3 billion and $1.7 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2021 and 2020, respectively.

Also, as of December 31, 2021 and 2020, the Firm had the following other restricted assets:

- Cash and securities pledged with clearing organizations for the benefit of customers of $47.5 billion and $37.2 billion, respectively.
- Securities with a fair value of $30.0 billion and $1.3 billion, respectively, were also restricted in relation to customer activity.

Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase Bank, N.A., and its subsidiaries, from lending to JPMorgan Chase & Co. ("Parent Company") and certain of its affiliates unless the loans are secured in specified amounts. Such secured loans provided by any banking subsidiary to the Parent Company or to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as "covered transactions"), must be made on terms and conditions that are consistent with safe and sound banking practices. In addition, unless collateralized with cash or US Government debt obligations, covered transactions are generally limited to 10% of the banking subsidiary's total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between any banking subsidiary and all of its affiliates is limited to 20% of the banking subsidiary's total capital.

The Parent Company's two principal subsidiaries are JPMorgan Chase Bank, N.A. and JPMorgan Chase Holdings LLC, an intermediate holding company (the "IHC"). The IHC generally holds the stock of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and provides intercompany loans to the Parent Company. The Parent Company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The principal sources of income and funding for the Parent Company are dividends from JPMorgan Chase Bank, N.A. and dividends and extensions of credit from the IHC. In addition to dividend restrictions set forth in statutes and regulations, the Federal Reserve, the OCC and the FDIC have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including the Parent Company and its subsidiaries that are banks or bank holding companies, if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization. The IHC is prohibited from paying dividends or extending credit to the Parent Company if certain capital or liquidity "thresholds" are breached or if limits are otherwise imposed by the Parent Company's management or Board of Directors.

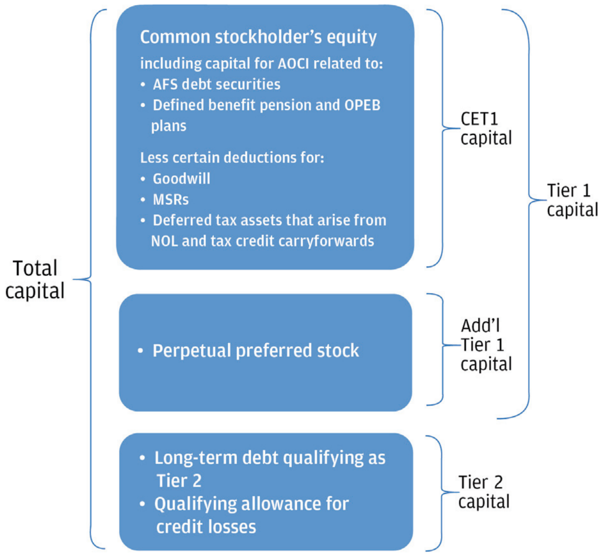
At January 1, 2022, the Parent Company's banking subsidiaries could pay, in the aggregate, approximately $20 billion in dividends to their respective bank holding companies without the prior approval of their relevant banking regulators. The capacity to pay dividends in 2022 will be supplemented by the banking subsidiaries' earnings during the year.

Note 27 – Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized requirements, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's principal IDI subsidiary, JPMorgan Chase Bank, N.A.

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. bank holding companies and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Firm and JPMorgan Chase Bank, N.A. is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements.

The three components of regulatory capital under the Basel III rules are as illustrated below:



Under the risk-based capital and leverage-based guidelines of the Federal Reserve, JPMorgan Chase is required to maintain minimum ratios for CET1 capital, Tier 1 capital, Total capital, Tier 1 leverage and the SLR. Failure to meet these minimum requirements could cause the Federal Reserve to take action. IDI subsidiaries are also subject to these capital requirements established by their respective primary regulators.

The following table presents the risk-based regulatory capital ratio requirements and well-capitalized ratios to which the Firm and its IDI subsidiaries were subject as of December 31, 2021 and 2020.

	Standardized capital ratio requirements		Advanced capital ratio requirements		Well-capitalized ratios	
	BHC[a][b]	IDI[c]	BHC[a]	IDI[c]	BHC[d]	IDI[e]
Risk-based capital ratios						
CET1 capital	11.2 %	7.0 %	10.5 %	7.0 %	NA	6.5 %
Tier 1 capital	12.7	8.5	12.0	8.5	6.0 %	8.0
Total capital	14.7	10.5	14.0	10.5	10.0	10.0

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.

(a) Represents the regulatory capital ratio requirements applicable to the Firm. The CET1, Tier 1 and Total capital ratio requirements each include a respective minimum requirement plus a GSIB surcharge of 3.5% as calculated under Method 2; plus a 3.2% SCB for Basel III Standardized ratios and a fixed 2.5% capital conservation buffer for Basel III Advanced ratios. The countercyclical buffer is currently set to 0% by the federal banking agencies.
(b) For the period ended December 31, 2020, the CET1, Tier 1, and Total capital ratio requirements under Basel III Standardized applicable to the Firm were 11.3%, 12.8% and 14.8%, respectively.
(c) Represents requirements for JPMorgan Chase's IDI subsidiaries. The CET1, Tier 1 and Total capital ratio requirements include a fixed capital conservation buffer requirement of 2.5% that is applicable to the IDI subsidiaries. The IDI subsidiaries are not subject to the GSIB surcharge.
(d) Represents requirements for bank holding companies pursuant to regulations issued by the Federal Reserve.
(e) Represents requirements for IDI subsidiaries pursuant to regulations issued under the FDIC Improvement Act.

The following table presents the leverage-based regulatory capital ratio requirements and well-capitalized ratios to which the Firm and its IDI subsidiaries were subject as of December 31, 2021 and 2020.

	Capital ratio requirements[a]		Well-capitalized ratios	
	BHC	IDI	BHC[b]	IDI
Leverage-based capital ratios				
Tier 1 leverage	4.0 %	4.0 %	NA	5.0 %
SLR	5.0	6.0	NA	6.0

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.
(a) Represents minimum SLR requirement of 3.0%, as well as supplementary leverage buffer requirements of 2.0% and 3.0% for BHC and IDI subsidiaries, respectively.
(b) The Federal Reserve's regulations do not establish well-capitalized thresholds for these measures for BHCs.

Current Expected Credit Losses
The Firm elected to apply the CECL capital transition provisions as permitted by the federal banking agencies delaying the effects of CECL on regulatory capital for two years until January 1, 2022, followed by a three-year transition period ("CECL capital transition provisions").

As of December 31, 2021, the capital metrics of the Firm reflected the benefit of the CECL capital transition provisions of $2.9 billion, which will be phased in at 25% per year beginning January 1, 2022.

The CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure and are also subject to the three-year transition period beginning January 1, 2022.

The following tables present risk-based capital metrics under both the Basel III Standardized and Basel III Advanced approaches and leverage-based capital metrics for JPMorgan Chase and JPMorgan Chase Bank, N.A. As of December 31, 2021 and 2020, JPMorgan Chase and JPMorgan Chase Bank, N.A. were well-capitalized and met all capital requirements to which each was subject.

	Basel III Standardized		Basel III Advanced	
December 31, 2021 (in millions, except ratios)	JPMorgan Chase & Co.[(a)]	JPMorgan Chase Bank, N.A.[(a)]	JPMorgan Chase & Co.[(a)]	JPMorgan Chase Bank, N.A.[(a)]
Risk-based capital metrics:				
CET1 capital	**$ 213,942**	**$ 266,907**	**$ 213,942**	**$ 266,907**
Tier 1 capital	**246,162**	**266,910**	**246,162**	**266,910**
Total capital	**274,900**	**281,826**	**265,796**	**272,299**
Risk-weighted assets	**1,638,900**	**1,582,280**	**1,547,920**	**1,392,847**
CET1 capital ratio	**13.1 %**	**16.9 %**	**13.8 %**	**19.2 %**
Tier 1 capital ratio	**15.0**	**16.9**	**15.9**	**19.2**
Total capital ratio	**16.8**	**17.8**	**17.2**	**19.5**

	Basel III Standardized		Basel III Advanced	
December 31, 2020 (in millions, except ratios)	JPMorgan Chase & Co.[(a)]	JPMorgan Chase Bank, N.A.[(a)]	JPMorgan Chase & Co.[(a)]	JPMorgan Chase Bank, N.A.[(a)]
Risk-based capital metrics:				
CET1 capital	$ 205,078	$ 234,235	$ 205,078	$ 234,235
Tier 1 capital	234,844	234,237	234,844	234,237
Total capital	269,923	252,045	257,228	239,673
Risk-weighted assets	1,560,609	1,492,138	1,484,431	1,343,185
CET1 capital ratio	13.1 %	15.7 %	13.8 %	17.4 %
Tier 1 capital ratio	15.0	15.7	15.8	17.4
Total capital ratio	17.3	16.9	17.3	17.8

(a) The capital metrics reflect the CECL capital transition provisions. Additionally, loans originated under the PPP receive a zero percent risk weight.

	December 31, 2021		December 31, 2020	
Three months ended (in millions, except ratios)	JPMorgan Chase & Co.[(b)]	JPMorgan Chase Bank, N.A.[(b)]	JPMorgan Chase & Co.[(b)(c)]	JPMorgan Chase Bank, N.A.[(b)(c)]
Leverage-based capital metrics:				
Adjusted average assets[(a)]	**$ 3,782,035**	**$ 3,334,925**	$ 3,353,319	$ 2,970,285
Tier 1 leverage ratio	**6.5 %**	**8.0 %**	7.0 %	7.9 %
Total leverage exposure	**$ 4,571,789**	**$ 4,119,286**	$ 3,401,542	$ 3,688,797
SLR	**5.4 %**	**6.5 %**	6.9 %	6.3 %

(a) Adjusted average assets, for purposes of calculating the leverage ratio, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.
(b) The capital metrics reflect the CECL capital transition provisions.
(c) JPMorgan Chase's total leverage exposure for purposes of calculating the SLR, excludes on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the interim final rule issued by the Federal Reserve which became effective April 1, 2020 and remained in effect through March 31, 2021. On June 1, 2020, the Federal Reserve, OCC and FDIC issued an interim final rule which became effective April 1, 2020 and remained in effect through March 31, 2021 that provides IDI subsidiaries with an option to apply this temporary exclusion subject to certain restrictions. JPMorgan Chase Bank, N.A. did not elect to apply this exclusion.

Note 28 – Off–balance sheet lending-related financial instruments, guarantees, and other commitments

JPMorgan Chase provides lending-related financial instruments (e.g., commitments and guarantees) to address the financing needs of its customers and clients. The contractual amount of these financial instruments represents the maximum possible credit risk to the Firm should the customer or client draw upon the commitment or the Firm be required to fulfill its obligation under the guarantee, and should the customer or client subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Firm's view, representative of its expected future credit exposure or funding requirements.

To provide for expected credit losses in wholesale and certain consumer lending-related commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 13 for further information regarding the allowance for credit losses on lending-related commitments. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2021 and 2020. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Firm can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Firm typically closes credit card lines when the borrower is 60 days or more past due. The Firm may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

Off–balance sheet lending-related financial instruments, guarantees and other commitments

By remaining maturity at December 31, (in millions)	Contractual amount 2021 Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	2020 Total	Carrying value[i] 2021	2020
Lending-related								
Consumer, excluding credit card:								
Residential Real Estate[a]	$ 15,649	$ 2,216	$ 5,797	$ 9,334	$ 32,996	$ 46,047	100	148
Auto and other	11,387	–	–	951	12,338	11,272	2	–
Total consumer, excluding credit card	27,036	2,216	5,797	10,285	45,334	57,319	102	148
Credit card[b]	730,534	–	–	–	730,534	658,506	–	–
Total consumer[b][c]	757,570	2,216	5,797	10,285	775,868	715,825	102	148
Wholesale:								
Other unfunded commitments to extend credit[d]	101,983	167,137	160,301	24,046	453,467	415,828	2,037	2,148
Standby letters of credit and other financial guarantees[d]	15,092	8,261	4,015	1,162	28,530	30,982	476	443
Other letters of credit[d]	3,854	498	96	–	4,448	3,053	9	14
Total wholesale[c]	120,929	175,896	164,412	25,208	486,445	449,863	2,522	2,605
Total lending-related	$ 878,499	$ 178,112	$ 170,209	$ 35,493	$1,262,313	$1,165,688	$ 2,624	$ 2,753
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[e]	$ 337,770	$ –	$ –	$ –	$ 337,770	$ 250,418	$ –	$ –
Derivatives qualifying as guarantees	3,119	396	12,296	39,919	55,730	54,415	475	322
Unsettled resale and securities borrowed agreements	101,553	2,128	–	–	103,681	102,355 [h]	1	2
Unsettled repurchase and securities loaned agreements	73,631	632	–	–	74,263	104,901	–	(1)
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	NA	NA	NA	NA	NA	NA	61	84
Loans sold with recourse	NA	NA	NA	NA	827	889	19	23
Exchange & clearing house guarantees and commitments[f]	182,701	–	–	–	182,701	142,003	–	–
Other guarantees and commitments[g]	5,028	2,980	283	2,199	10,490	9,639 [h]	69	52

(a) Includes certain commitments to purchase loans from correspondents.
(b) Also includes commercial card lending-related commitments primarily in CB and CIB.
(c) Predominantly all consumer and wholesale lending-related commitments are in the U.S.
(d) At December 31, 2021 and 2020, reflected the contractual amount net of risk participations totaling $44 million and $72 million, respectively, for other unfunded commitments to extend credit; $7.9 billion and $8.5 billion, respectively, for standby letters of credit and other financial guarantees; and $451 million and $357 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) At December 31, 2021 and 2020, collateral held by the Firm in support of securities lending indemnification agreements was $357.4 billion and $264.3 billion, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.
(f) At December 31, 2021 and 2020, includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Firm's membership in certain clearing houses.
(g) At December 31, 2021 and 2020, primarily includes unfunded commitments related to certain tax-oriented equity investments, unfunded commitments to purchase secondary market loans, and other equity investment commitments.
(h) Prior-period amounts have been revised to conform with the current presentation.
(i) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, and lending-related commitments for which the fair value option was elected, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Firm also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Firm considers the following off–balance sheet arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements, certain derivative contracts and the guarantees under the sponsored member repo program.

As required by U.S. GAAP, the Firm initially records guarantees at the inception date fair value of the non-contingent obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For these obligations, the Firm records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. The lending-related contingent obligation is recognized based on expected credit losses in addition to, and separate from, any non-contingent obligation.

Non-lending-related contingent obligations are recognized when the liability becomes probable and reasonably estimable. These obligations are not recognized if the estimated amount is less than the carrying amount of any non-contingent liability recognized at inception (adjusted for any amortization). Examples of non-lending-related contingent obligations include indemnifications provided in sales agreements, where a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Firm's risk is reduced (i.e., over time or when the indemnification expires).

The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 284.

For additional information on the guarantees, see below.

Standby letters of credit and other financial guarantees
Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Firm to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade financings and similar transactions.

The following table summarizes the contractual amount and carrying value of standby letters of credit and other financial guarantees and other letters of credit arrangements as of December 31, 2021 and 2020.

Standby letters of credit, other financial guarantees and other letters of credit

	2021		2020	
December 31, (in millions)	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade[a]	**$ 19,998**	**$ 3,087**	$ 22,850	$ 2,263
Noninvestment-grade[a]	**8,532**	**1,361**	8,132	790
Total contractual amount	**$ 28,530**	**$ 4,448**	$ 30,982	$ 3,053
Allowance for lending-related commitments	**$ 123**	**$ 9**	$ 80	$ 14
Guarantee liability	**353**	**–**	363	–
Total carrying value	**$ 476**	**$ 9**	$ 443	$ 14
Commitments with collateral	**$ 14,511**	**$ 999**	$ 17,238	$ 498

(a) The ratings scale is based on the Firm's internal risk ratings. Refer to Note 12 for further information on internal risk ratings.

Securities lending indemnifications
Through the Firm's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Firm provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Firm obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Firm would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

The cash collateral held by the Firm may be invested on behalf of the client in indemnified resale agreements, whereby the Firm indemnifies the client against the loss of principal invested. To minimize its liability under these agreements, the Firm obtains collateral with a market value exceeding 100% of the principal invested.

Derivatives qualifying as guarantees
The Firm transacts in certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Firm to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Firm may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Firm to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Firm to elect to terminate the contract under certain conditions.

The notional value of derivative guarantees generally represents the Firm's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Firm's view, of whether the Firm will be required to perform under the contract. The Firm reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2021 and 2020.

(in millions)	**December 31, 2021**	December 31, 2020
Notional amounts		
Derivative guarantees	**$ 55,730**	$ 54,415
Stable value contracts with contractually limited exposure	**29,778**	27,752
Maximum exposure of stable value contracts with contractually limited exposure	**2,882**	2,803
Fair value		
Derivative payables	**475**	322

In addition to derivative contracts that meet the characteristics of a guarantee, the Firm is both a purchaser and seller of credit protection in the credit derivatives market. Refer to Note 5 for a further discussion of credit derivatives.

Unsettled securities financing agreements

In the normal course of business, the Firm enters into resale and securities borrowed agreements. At settlement, these commitments result in the Firm advancing cash to and receiving securities collateral from the counterparty. The Firm also enters into repurchase and securities loaned agreements. At settlement, these commitments result in the Firm receiving cash from and providing securities collateral to the counterparty. Such agreements settle at a future date. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly have regular-way settlement terms. Refer to Note 11 for a further discussion of securities financing agreements.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability
In connection with the Firm's mortgage loan sale and securitization activities with U.S. GSEs the Firm has made representations and warranties that the loans sold meet certain requirements, and that may require the Firm to repurchase mortgage loans and/or indemnify the loan purchaser if such representations and warranties are breached by the Firm.

Private label securitizations
The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Firm in establishing its litigation reserves.

Refer to Note 30 for additional information regarding litigation.

Loans sold with recourse
The Firm provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Firm is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk

with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Firm's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2021 and 2020, the unpaid principal balance of loans sold with recourse totaled $827 million and $889 million, respectively. The carrying value of the related liability that the Firm has recorded in accounts payable and other liabilities on the Consolidated balance sheets, which is representative of the Firm's view of the likelihood it will have to perform under its recourse obligations, was $19 million and $23 million at December 31, 2021 and 2020, respectively.

Other off-balance sheet arrangements

Indemnification agreements – general

In connection with issuing securities to investors outside the U.S., the Firm may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Firm the right to redeem the securities if such additional amounts are payable. The Firm may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Firm prior to the sale of the business or assets. It is difficult to estimate the Firm's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Merchant charge-backs

Under the rules of payment networks, the Firm, in its role as a merchant acquirer, retains a contingent liability for disputed processed credit and debit card transactions that result in a charge-back to the merchant. If a dispute is resolved in the cardholder's favor, Merchant Services will (through the cardholder's issuing bank) credit or refund the amount to the cardholder and will charge back the transaction to the merchant. If Merchant Services is unable to collect the amount from the merchant, Merchant Services will bear the loss for the amount credited or refunded to the cardholder. Merchant Services mitigates this risk by withholding future settlements, retaining cash reserve accounts or obtaining other collateral. In addition, Merchant Services recognizes a valuation allowance that covers the payment or performance risk to the Firm related to charge-backs.

For the years ended December 31, 2021, 2020 and 2019, Merchant Services processed an aggregate volume of $1,886.7 billion, $1,597.3 billion, and $1,511.5 billion, respectively.

Clearing Services – Client Credit Risk

The Firm provides clearing services for clients by entering into securities purchases and sales and derivative contracts with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Firm stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin: variation margin is posted on a daily basis based on the value of clients' derivative contracts and initial margin is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Firm is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, the Firm seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Firm can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Firm would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Firm as a clearing member.

The Firm reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Firm's Consolidated Financial Statements.

It is difficult to estimate the Firm's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Firm, management believes it is unlikely that the Firm will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

Refer to Note 5 for information on the derivatives that the Firm executes for its own account and records in its Consolidated Financial Statements.

Exchange & Clearing House Memberships
The Firm is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services to its clients. Membership in some of these organizations requires the Firm to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Firm's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may also include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Firm as a member to pay a pro rata share of losses that may result from the clearing house's investment of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. In certain cases, it is difficult to estimate the Firm's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Firm to be remote. Where the Firm's maximum possible exposure can be estimated, the amount is disclosed in the table on page 284, in the Exchange & clearing house guarantees and commitments line.

Sponsored member repo program
The Firm acts as a sponsoring member to clear eligible overnight and term resale and repurchase agreements through the Government Securities Division of the Fixed Income Clearing Corporation ("FICC") on behalf of clients that become sponsored members under the FICC's rules. The Firm also guarantees to the FICC the prompt and full payment and performance of its sponsored member clients' respective obligations under the FICC's rules. The Firm minimizes its liability under these guarantees by obtaining a security interest in the cash or high-quality securities collateral that the clients place with the clearing house; therefore, the Firm expects the risk of loss to be remote. The Firm's maximum possible exposure, without taking into consideration the associated collateral, is included in the Exchange & clearing house guarantees and commitments line on page 284. Refer to Note 11 for additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements.

Guarantees of subsidiaries
In the normal course of business, the Parent Company may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries on a contract-by-contract basis, as negotiated with the Firm's counterparties. The obligations of the subsidiaries are included on the Firm's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Parent Company has not recognized a separate liability for these guarantees. The Firm believes that the occurrence of any event that would trigger payments by the Parent Company under these guarantees is remote.

The Parent Company has guaranteed certain long-term debt and structured notes of its subsidiaries, including JPMorgan Chase Financial Company LLC ("JPMFC"), a 100%-owned finance subsidiary. All securities issued by JPMFC are fully and unconditionally guaranteed by the Parent Company and no other subsidiary of the parent company guarantees these securities. These guarantees, which rank on a parity with the Firm's unsecured and unsubordinated indebtedness, are not included in the table on page 284 of this Note. Refer to Note 20 for additional information.

Note 29 – Pledged assets and collateral

Pledged assets

The Firm pledges financial assets that it owns to maintain potential borrowing capacity at discount windows with Federal Reserve banks, various other central banks and FHLBs. Additionally, the Firm pledges assets for other purposes, including to collateralize repurchase and other securities financing agreements, to cover short sales and to collateralize derivative contracts and deposits. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated balance sheets as assets pledged.

The following table presents the Firm's pledged assets.

December 31, (in billions)	2021	2020
Assets that may be sold or repledged or otherwise used by secured parties	**$ 126.3**	$ 166.6
Assets that may not be sold or repledged or otherwise used by secured parties	**112.0**	113.9
Assets pledged at Federal Reserve banks and FHLBs	**476.4**	455.3
Total pledged assets	**$ 714.7**	$ 735.8

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 14 for additional information on assets and liabilities of consolidated VIEs. Refer to Note 11 for additional information on the Firm's securities financing activities. Refer to Note 20 for additional information on the Firm's long-term debt. The significant components of the Firm's pledged assets were as follows.

December 31, (in billions)	2021	2020
Investment securities	**$ 80.1**	$ 80.2
Loans	**428.5**	420.5
Trading assets and other	**206.1**	235.1
Total pledged assets	**$ 714.7**	$ 735.8

Collateral

The Firm accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale and other securities financing agreements, prime brokerage-related held-for-investment customer receivables and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts and deposits.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2021	2020
Collateral permitted to be sold or repledged, delivered, or otherwise used	**$ 1,471.3**	$ 1,451.7
Collateral sold, repledged, delivered or otherwise used	**1,111.0**	1,038.9

Note 30 – Litigation

Contingencies

As of December 31, 2021, the Firm and its subsidiaries and affiliates are defendants or respondents in numerous legal proceedings, including private, civil litigations, government investigations or regulatory enforcement matters. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations and regulatory enforcement matters involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of the Firm's lines of business and several geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

The Firm believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from $0 to approximately $1.5 billion at December 31, 2021. This estimated aggregate range of reasonably possible losses was based upon information available as of that date for those proceedings in which the Firm believes that an estimate of reasonably possible loss can be made. For certain matters, the Firm does not believe that such an estimate can be made, as of that date. The Firm's estimate of the aggregate range of reasonably possible losses involves significant judgment, given:

- the number, variety and varying stages of the proceedings, including the fact that many are in preliminary stages,
- the existence in many such proceedings of multiple defendants, including the Firm, whose share of liability (if any) has yet to be determined,
- the numerous yet-unresolved issues in many of the proceedings, including issues regarding class certification and the scope of many of the claims, and
- the attendant uncertainty of the various potential outcomes of such proceedings, including where the Firm has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect.

In addition, the outcome of a particular proceeding may be a result which the Firm did not take into account in its estimate because the Firm had deemed the likelihood of that outcome to be remote. Accordingly, the Firm's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of the Firm's material legal proceedings.

Amrapali. India's Enforcement Directorate ("ED") is investigating J.P.Morgan India Private Limited in connection with investments made in 2010 and 2012 by two offshore funds formerly managed by JPMorgan Chase entities into residential housing projects developed by the Amrapali Group ("Amrapali"). In 2017, numerous creditors filed civil claims against Amrapali, including petitions brought by home buyers relating to delays in delivering or failure to deliver residential units. The home buyers' petitions have been overseen by the Supreme Court of India and are ongoing. In August 2021, the ED issued an order fining J.P. Morgan India Private Limited approximately $31.5 million. The Firm is appealing the order and the fine. Relatedly, in July 2019, the Supreme Court of India issued an order making preliminary findings that Amrapali and other parties, including unspecified JPMorgan Chase entities and the offshore funds that had invested in the projects, violated certain currency control and money laundering provisions, and ordering the ED to conduct a further inquiry under India's Prevention of Money Laundering Act ("PMLA") and Foreign Exchange Management Act ("FEMA"). In May 2020, the ED attached approximately $25 million from J.P. Morgan India Private Limited in connection with the criminal PMLA investigation. The Firm is responding to and cooperating with the PMLA investigation.

Federal Republic of Nigeria Litigation. JPMorgan Chase Bank, N.A. operated an escrow and depository account for the Federal Government of Nigeria ("FGN") and two major international oil companies. The account held approximately $1.1 billion in connection with a dispute among the clients over rights to an oil field. Following the settlement of the dispute, JPMorgan Chase Bank, N.A. paid out the monies in the account in 2011 and 2013 in accordance with directions received from its clients. In November 2017, the Federal Republic of Nigeria ("FRN") commenced a claim in the English High Court for approximately $875 million in payments made out of the accounts. The FRN, claiming to be the same entity as the FGN, alleges that the payments were instructed as part of a complex fraud not involving JPMorgan Chase Bank, N.A., but that JPMorgan Chase Bank, N.A. was or should have been on notice that the payments may be fraudulent. JPMorgan Chase Bank, N.A. applied for summary judgment and was unsuccessful. The claim is ongoing and a trial commenced in February 2022.

Foreign Exchange Investigations and Litigation. The Firm previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. Among those resolutions, in May 2015, the Firm pleaded guilty to a single violation of federal antitrust law. The Department of Labor granted the Firm a five-year exemption of disqualification that allows the Firm and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act (“ERISA”) until January 2023. The Firm will need the Department of Labor to approve a further exemption to cover the remainder of the ten-year disqualification period following the antitrust plea. The only remaining FX-related governmental inquiry is a South Africa Competition Commission matter which is currently pending before the South Africa Competition Tribunal.

With respect to civil litigation matters, in August 2018, the United States District Court for the Southern District of New York granted final approval to the Firm’s settlement of a consolidated class action brought by U.S.-based plaintiffs, which principally alleged violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates and also sought damages on behalf of persons who transacted in FX futures and options on futures. Certain members of the settlement class filed requests to the Court to be excluded from the class, and certain of them filed a complaint against the Firm and other foreign exchange dealers in November 2018. A number of these actions remain pending. Further, a putative class action has been filed against the Firm and other foreign exchange dealers on behalf of certain consumers who purchased foreign currencies at allegedly inflated rates. Another putative class action was brought against the Firm and other foreign exchange dealers on behalf of purported indirect purchasers of FX instruments. In 2020, the Court approved a settlement by the Firm and 11 other defendants of that class action for a total of $10 million. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel, the Netherlands, Brazil and Australia.

Inquiries Concerning Preservation Requirements. In December 2021 certain of the Firm’s subsidiaries entered into resolutions with the U.S. Securities and Exchange Commission (“SEC”) and the U.S. Commodity Futures Trading Commission (“CFTC”) to resolve their respective civil investigations of compliance with records preservation requirements applicable to broker-dealer firms, swap dealers and futures commission merchants. The SEC and CFTC found that J.P. Morgan Securities LLC did not maintain copies of certain communications required to be maintained under their respective record keeping rules, where such communications were sent or received by employees over electronic messaging channels that had not been approved for employee use by the Firm. The CFTC resolution also included JPMorgan Chase Bank, N.A. and J.P. Morgan Securities plc as swap dealers. The SEC and CFTC also found related supervision failures. Under these resolutions, J.P. Morgan Securities LLC paid a $125 million civil monetary penalty to the SEC, and J.P. Morgan Securities LLC, JPMorgan Chase Bank, N.A. and J.P. Morgan Securities plc paid a total $75 million civil monetary penalty to the CFTC. The Firm continues to respond to requests for information and other material from certain authorities concerning its compliance with records preservation requirements in connection with business communications sent over electronic messaging channels that have not been approved by the Firm. The Firm is cooperating with these inquiries.

Interchange Litigation. Groups of merchants and retail associations filed a series of class action complaints alleging that Visa and Mastercard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted related rules in violation of antitrust laws. In 2012, the parties initially settled the cases for a cash payment, a temporary reduction of credit card interchange, and modifications to certain credit card network rules. In 2017, after the approval of that settlement was reversed on appeal, the case was remanded to the United States District Court for the Eastern District of New York for further proceedings consistent with the appellate decision.

The original class action was divided into two separate actions, one seeking primarily monetary relief and the other seeking primarily injunctive relief. In September 2018, the parties to the monetary class action finalized an agreement which amends and supersedes the prior settlement agreement. Pursuant to this settlement, the defendants collectively contributed an additional $900 million to the approximately $5.3 billion previously held in escrow from the original settlement. In December 2019, the amended settlement agreement was approved by the District Court. Certain merchants appealed the District Court’s approval order, and those appeals are pending. Based on the percentage of merchants that opted out of the amended class settlement, $700 million has been returned to the defendants from the settlement escrow in accordance with the settlement agreement. The injunctive class action continues separately, and in September 2021, the District Court granted plaintiffs’ motion for class certification in part, and denied the motion in part.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and Mastercard, as well as against the Firm and other banks, and some of those actions remain pending.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association’s ("BBA") London Interbank Offered Rate (“LIBOR”) for various currencies and the European Banking Federation’s Euro Interbank Offered Rate (“EURIBOR”). The Swiss Competition Commission’s investigation relating to EURIBOR, to which the Firm and other banks are subject, continues. In December 2016, the European Commission issued a decision against the Firm and other banks finding an infringement of European antitrust rules relating to EURIBOR. The Firm has filed an appeal of that decision with the European General Court, and that appeal is pending.

In addition, the Firm has been named as a defendant along with other banks in various individual and putative class actions related to benchmark rates, including U.S. dollar LIBOR. In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, the Firm has obtained dismissal of certain actions and resolved certain other actions, and others are in various stages of litigation. The United States District Court for the Southern District of New York has granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants, including the Firm. A consolidated putative class action related to the period that U.S. dollar LIBOR was administered by ICE Benchmark Administration has been dismissed. In addition, a group of individual plaintiffs filed a lawsuit asserting antitrust claims, alleging that the Firm and other defendants were engaged in an unlawful agreement to set U.S. dollar LIBOR and conspired to monopolize the market for LIBOR-based consumer loans and credit cards. Defendants moved to dismiss plaintiffs' complaint. In December 2021, the court denied plaintiffs' motions for a preliminary injunction seeking to enjoin defendants from setting U.S. dollar LIBOR and enforcing any financial instruments that rely on U.S. dollar LIBOR. The Firm's settlements of putative class actions related to Swiss franc LIBOR, the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate, and the Australian Bank Bill Swap Reference Rate remain subject to court approval.

Metals and U.S. Treasuries Investigations and Litigation and Related Inquiries. The Firm previously reported that it and/or certain of its subsidiaries had entered into resolutions with the U.S. Department of Justice ("DOJ"), the U.S. Commodity Futures Trading Commission ("CFTC") and the U.S. Securities and Exchange Commission ("SEC"), which, collectively, resolved those agencies' respective investigations relating to historical trading practices by former employees in the precious metals and U.S. treasuries markets and related conduct from 2008 to 2016.

The Firm entered into a Deferred Prosecution Agreement ("DPA") with the DOJ in which it agreed to the filing of a criminal information charging JPMorgan Chase & Co. with two counts of wire fraud and agreed, along with JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC, to certain terms and obligations as set forth therein. Under the terms of the DPA, the criminal information will be dismissed after three years, provided that JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC fully comply with all of their obligations.

Across the three resolutions with the DOJ, CFTC and SEC, JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC agreed to pay a total monetary amount of approximately $920 million. A portion of the total monetary amount includes victim compensation payments.

Several putative class action complaints have been filed in the United States District Court for the Southern District of New York against the Firm and certain former employees, alleging a precious metals futures and options price manipulation scheme in violation of the Commodity Exchange Act. Some of the complaints also allege unjust enrichment and deceptive acts or practices under the General Business Law of the State of New York. The Court consolidated these putative class actions, and, in December 2021, the Court preliminarily approved a settlement among the parties. In addition, several putative class actions were filed in the United States District Courts for the Northern District of Illinois and Southern District of New York against the Firm, alleging manipulation of U.S. Treasury futures and options, and bringing claims under the Commodity Exchange Act. The actions in the Northern District of Illinois were transferred to the Southern District of New York. The Court consolidated these putative class actions, and, in December 2021, the Court preliminarily approved a settlement among the parties. In Canada, plaintiffs have moved to commence putative class action proceedings based on similar alleged underlying conduct related to precious metals.

In October 2020, two putative class action complaints were filed under the Securities Exchange Act of 1934 in the United States District Court for the Eastern District of New York against the Firm and certain individual defendants on behalf of shareholders who acquired shares during the putative class period alleging that certain SEC filings of the Firm were materially false or misleading in that they did not disclose certain information relating to the above-referenced investigations. The Court consolidated these putative class actions in January 2021. Plaintiffs filed their second amended complaint in May 2021, which additionally alleged that certain orders in precious metals futures contracts placed by precious metals futures traders during the putative class period were materially false and misleading. Defendants have moved to dismiss.

Securities Lending Antitrust Litigation. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, J.P. Morgan Prime, Inc., and J.P. Morgan Strategic Securities Lending Corp. are named as defendants in a putative class action filed in the United States District Court for the Southern District of New York. The complaint asserts violations of federal antitrust law and New York State common law in connection with an alleged conspiracy to prevent the emergence of anonymous exchange trading for securities lending transactions. Defendants' motion to dismiss the complaint was denied. Plaintiffs have moved to certify a class in this action, which defendants are opposing.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries are named as defendants or are otherwise involved in a substantial number of other legal proceedings. The Firm believes it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

The Firm has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Firm accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. The Firm evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upward or downward, as appropriate, based on management's best judgment after consultation with counsel. The Firm's legal expense was $426 million, $1.1 billion and $239 million for the years ended December 31, 2021, 2020 and 2019, respectively. There is no assurance that the Firm's litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, the Firm cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase believes, based upon its current knowledge and after consultation with counsel, consideration of the material legal proceedings described above and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the other legal proceedings currently pending against it should not have a material adverse effect on the Firm's consolidated financial condition. The Firm notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase's income for that period.

Note 31 – International operations

The following table presents income statement and balance sheet-related information for JPMorgan Chase by major international geographic area. The Firm defines international activities for purposes of this footnote presentation as business transactions that involve clients residing outside of the U.S., and the information presented below is based predominantly on the domicile of the client, the location from which the client relationship is managed, booking location or the location of the trading desk. However, many of the Firm's U.S. operations serve international businesses.

As the Firm's operations are highly integrated, estimates and subjective assumptions have been made to apportion revenue and expense between U.S. and international operations. These estimates and assumptions are consistent with the allocations used for the Firm's segment reporting as set forth in Note 32.

The Firm's long-lived assets for the periods presented are not considered by management to be significant in relation to total assets. The majority of the Firm's long-lived assets are located in the U.S.

As of or for the year ended December 31, (in millions)	Revenue[c]	Expense[d]	Income before income tax expense	Net income	Total assets
2021					
Europe/Middle East/Africa	**$ 16,561**	**$ 10,833**	**$ 5,728**	**$ 4,202**	**$ 517,904** [e]
Asia-Pacific	**9,654**	**6,372**	**3,282**	**2,300**	**277,897**
Latin America/Caribbean	**2,756**	**1,589**	**1,167**	**878**	**61,657**
Total international	**28,971**	**18,794**	**10,177**	**7,380**	**857,458**
North America[a]	**92,678**	**43,293**	**49,385**	**40,954**	**2,886,109**
Total	**$ 121,649**	**$ 62,087**	**$ 59,562**	**$ 48,334**	**$ 3,743,567**
2020[b]					
Europe/Middle East/Africa	$ 16,566	$ 10,987	$ 5,579	$ 3,868	$ 530,687 [e]
Asia-Pacific	9,289	5,558	3,731	2,630	252,553
Latin America/Caribbean	2,740	1,590	1,150	837	61,980
Total international	28,595	18,135	10,460	7,335	845,220
North America[a]	91,356	66,001	25,355	21,796	2,539,537
Total	$ 119,951	$ 84,136	$ 35,815	$ 29,131	$ 3,384,757
2019[b]					
Europe/Middle East/Africa	$ 15,887	$ 9,860	$ 6,027	$ 4,158	$ 391,369 [e]
Asia-Pacific	7,254	5,060	2,194	1,467	183,023
Latin America/Caribbean	2,405	1,561	844	609	47,820
Total international	25,546	16,481	9,065	6,234	622,212
North America[a]	90,174	54,373	35,801	30,197	2,064,265
Total	$ 115,720	$ 70,854	$ 44,866	$ 36,431	$ 2,686,477

(a) Substantially reflects the U.S.
(b) Prior-period amounts have been revised to conform with the current presentation.
(c) Revenue is composed of net interest income and noninterest revenue.
(d) Expense is composed of noninterest expense and the provision for credit losses.
(e) Total assets for the U.K. were approximately $365 billion, $353 billion and $309 billion at December 31, 2021, 2020 and 2019, respectively.

Note 32 – Business segments

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Segment results of this footnote for a further discussion of JPMorgan Chase's business segments.

The following is a description of each of the Firm's business segments, and the products and services they provide to their respective client bases.

Consumer & Community Banking

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit, investment and lending products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Corporate & Investment Bank

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Commercial Banking

Commercial Banking provides comprehensive financial solutions, including lending, payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and midsized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Asset & Wealth Management

Asset & Wealth Management, with client assets of $4.3 trillion, is a global leader in investment and wealth management.

Asset Management
Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Global Private Bank
Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Corporate

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

Segment results

The following table provides a summary of the Firm's segment results as of or for the years ended December 31, 2021, 2020 and 2019, on a managed basis. The Firm's definition of managed basis starts with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. This allows management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense/(benefit). These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Capital allocation

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. The assumptions and methodologies used to allocate capital are periodically reassessed and as a result, the capital allocated to the LOBs may change from time to time.

Segment results and reconciliation[(a)]

(Table continued on next page)

As of or for the year ended December 31, (in millions, except ratios)	Consumer & Community Banking			Corporate & Investment Bank			Commercial Banking			Asset & Wealth Management		
	2021	2020	2019	**2021**	2020	2019	**2021**	2020	2019	**2021**	2020	2019
Noninterest revenue	**$17,286**	$ 17,740	$ 17,796	**$38,209**	$ 35,120	$30,060	**$ 3,929**	$ 3,067	$ 2,710	**$13,071**	$10,822	$10,236
Net interest income	**32,787**	33,528	37,337	**13,540**	14,164	9,205	**6,079**	6,246	6,554	**3,886**	3,418	3,355
Total net revenue	**50,073**	51,268	55,133	**51,749**	49,284	39,265	**10,008**	9,313	9,264	**16,957**	14,240	13,591
Provision for credit losses	**(6,989)**	12,312	4,954	**(1,174)**	2,726	277	**(947)**	2,113	296	**(227)**	263	59
Noninterest expense	**29,256**	27,990	28,276	**25,325**	23,538	22,444	**4,041**	3,798	3,735	**10,919**	9,957	9,747
Income/(loss) before income tax expense/ (benefit)	**27,806**	10,966	21,903	**27,598**	23,020	16,544	**6,914**	3,402	5,233	**6,265**	4,020	3,785
Income tax expense/ (benefit)	**6,876**	2,749	5,362	**6,464**	5,926	4,590	**1,668**	824	1,275	**1,528**	1,028	918
Net income/(loss)	**$20,930**	$ 8,217	$ 16,541	**$21,134**	$ 17,094	$ 11,954	**$ 5,246**	$ 2,578	$ 3,958	**$ 4,737**	$ 2,992	$ 2,867
Average equity	**$50,000**	$ 52,000	$ 52,000	**$83,000**	$ 80,000	$ 80,000	**$24,000**	$22,000	$22,000	**$14,000**	$10,500	$10,500
Total assets	**500,370**	496,705	541,367	**1,259,896**	1,095,926 (b)	913,803 (b)	**230,776**	228,911	220,514	**234,425**	203,384	173,175
Return on equity	**41 %**	15 %	31 %	**25 %**	20 %	14 %	**21 %**	11 %	17 %	**33 %**	28 %	26 %
Overhead ratio	**58**	55	51	**49**	48	57	**40**	41	40	**64**	70	72

(Table continued from previous page)

As of or for the year ended December 31, (in millions, except ratios)	Corporate			Reconciling Items[(a)]			Total		
	2021	2020	2019	**2021**	2020	2019	**2021**	2020	2019
Noninterest revenue	**$ 68**	$ 1,199	$ (114)	**$ (3,225)**	$ (2,560) [(b)]	$ (2,213) [(b)]	**$ 69,338**	$ 65,388	$ 58,475 [(b)]
Net interest income	**(3,551)**	(2,375)	1,325	**(430)**	(418)	(531)	**52,311**	54,563	57,245
Total net revenue	**(3,483)**	(1,176)	1,211	**(3,655)**	(2,978)	(2,744)	**121,649**	119,951	115,720
Provision for credit losses	**81**	66	(1)	**–**	–	–	**(9,256)**	17,480	5,585
Noninterest expense	**1,802**	1,373	1,067	**–**	–	–	**71,343**	66,656	65,269
Income/(loss) before income tax expense/(benefit)	**(5,366)**	(2,615)	145	**(3,655)**	(2,978)	(2,744)	**59,562**	35,815	44,866
Income tax expense/(benefit)	**(1,653)**	(865)	(966)	**(3,655)**	(2,978) [(b)]	(2,744) [(b)]	**11,228**	6,684	8,435 [(b)]
Net income/(loss)	**$ (3,713)**	$ (1,750)	$ 1,111	**$ –**	$ –	$ –	**$ 48,334**	$ 29,131	$ 36,431
Average equity	**$ 79,968**	$ 72,365	$ 68,407	**$ –**	$ –	$ –	**$ 250,968**	$ 236,865	$ 232,907
Total assets	**1,518,100**	1,359,831	837,618	**NA**	NA	NA	**3,743,567**	3,384,757	2,686,477 [(b)]
Return on equity	**NM**	NM	NM	**NM**	NM	NM	**19 %**	12 %	15 %
Overhead ratio	**NM**	NM	NM	**NM**	NM	NM	**59**	56	56 [(b)]

(a) Segment results on a managed basis reflect revenue on a FTE basis with the corresponding income tax impact recorded within income tax expense/(benefit). These adjustments are eliminated in reconciling items to arrive at the Firm's reported U.S. GAAP results.

(b) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.

Note 33 – Parent Company

The following tables present Parent Company-only financial statements.

Statements of income and comprehensive income

Year ended December 31, (in millions)	2021	2020	2019
Income			
Dividends from subsidiaries and affiliates:			
Bank and bank holding company	**$ 10,000**	$ 6,000	$ 26,000
Non-bank[(a)]	**–**	–	–
Interest income from subsidiaries	**32**	63	223
Other income/(expense) from subsidiaries:			
Bank and bank holding company	**859**	2,019	2,738
Non-bank	**366**	(569)	197
Other income/(expense)	**1,137**	205	(1,731)
Total income	**12,394**	7,718	27,427
Expense			
Interest expense/(income) to subsidiaries and affiliates[(a)]	**5,353**	(8,830)	(5,303)
Other interest expense/(income)	**(1,349)**	14,150	13,246
Noninterest expense	**2,637**	2,222	1,992
Total expense	**6,641**	7,542	9,935
Income before income tax benefit and undistributed net income of subsidiaries	**5,753**	176	17,492
Income tax benefit	**1,329**	1,324	2,033
Equity in undistributed net income of subsidiaries	**41,252**	27,631	16,906
Net income	**$ 48,334**	$ 29,131	$ 36,431
Other comprehensive income/(loss), net	**(8,070)**	6,417	3,076
Comprehensive income	**$ 40,264**	$ 35,548	$ 39,507

Balance sheets

December 31, (in millions)	2021	2020
Assets		
Cash and due from banks	**$ 36**	$ 54
Deposits with banking subsidiaries	**6,809**	6,811
Trading assets	**2,293**	1,775
Advances to, and receivables from, subsidiaries:		
Bank and bank holding company	**431**	27
Non-bank	**50**	86
Investments (at equity) in subsidiaries and affiliates:		
Bank and bank holding company	**545,635**	508,602
Non-bank	**1,007**	1,011
Other assets	**12,220**	10,058
Total assets	**$ 568,481**	$ 528,424
Liabilities and stockholders' equity		
Borrowings from, and payables to, subsidiaries and affiliates[(a)]	**$ 28,039**	$ 25,150
Short-term borrowings	**1,018**	924
Other liabilities	**9,340**	9,612
Long-term debt[(b)(c)]	**235,957**	213,384
Total liabilities[(c)]	**274,354**	249,070
Total stockholders' equity	**294,127**	279,354
Total liabilities and stockholders' equity	**$ 568,481**	$ 528,424

Statements of cash flows

Year ended December 31, (in millions)	2021	2020	2019
Operating activities			
Net income	**$ 48,334**	$ 29,131	$ 36,431
Less: Net income of subsidiaries and affiliates[(a)]	**51,252**	33,631	42,906
Parent company net loss	**(2,918)**	(4,500)	(6,475)
Cash dividends from subsidiaries and affiliates[(a)]	**10,000**	6,000	26,000
Other operating adjustments	**(12,677)**	15,357	9,862
Net cash provided by/(used in) operating activities	**(5,595)**	16,857	29,387
Investing activities			
Net change in:			
Advances to and investments in subsidiaries and affiliates, net	**(3,000)**	(2,663)	(6) [(e)]
All other investing activities, net	**31**	24	71
Net cash provided by/(used in) investing activities	**(2,969)**	(2,639)	65
Financing activities			
Net change in:			
Borrowings from subsidiaries and affiliates[(a)]	**2,647**	1,425	2,941
Short-term borrowings	**–**	(20)	(56)
Proceeds from long-term borrowings	**49,169**	37,312	25,569
Payments of long-term borrowings	**(15,543)**	(34,194)	(21,226)
Proceeds from issuance of preferred stock	**7,350**	4,500	5,000
Redemption of preferred stock	**(2,575)**	(1,430)	(4,075)
Treasury stock repurchased	**(18,408)**	(6,517)	(24,001)
Dividends paid	**(12,858)**	(12,690)	(12,343)
All other financing activities, net	**(1,238)**	(1,080)	(1,290)
Net cash provided by/(used in) financing activities	**8,544**	(12,694)	(29,481)
Net increase/(decrease) in cash and due from banks and deposits with banking subsidiaries	**(20)**	1,524	(29)
Cash and due from banks and deposits with banking subsidiaries at the beginning of the year	**6,865**	5,341	5,370
Cash and due from banks and deposits with banking subsidiaries at the end of the year	**$ 6,845**	$ 6,865	$ 5,341
Cash interest paid	**$ 4,065**	$ 5,445	$ 7,957
Cash income taxes paid, net[(d)]	**15,259**	5,366	3,910

(a) Affiliates include trusts that issued guaranteed capital debt securities ("issuer trusts").

(b) At December 31, 2021, long-term debt that contractually matures in 2022 through 2026 totaled $10.7 billion, $16.6 billion, $24.2 billion, $22.8 billion, and $24.7 billion, respectively.

(c) Refer to Notes 20 and 28 for information regarding the Parent Company's guarantees of its subsidiaries' obligations.

(d) Represents payments, net of refunds, made by the Parent Company to various taxing authorities and includes taxes paid on behalf of certain of its subsidiaries that are subsequently reimbursed. The reimbursements were $13.9 billion, $8.3 billion, and $6.4 billion for the years ended December 31, 2021, 2020, and 2019, respectively.

(e) As a result of the merger of Chase Bank USA, N.A. with and into JPMorgan Chase Bank, N.A., JPMorgan Chase Bank, N.A. distributed $13.5 billion to the Parent company as a return of capital, which the Parent company contributed to the IHC.

Selected quarterly financial data (unaudited)

For the period ended	2021				2020			
(in millions)	4th quarter	3rd quarter	2nd quarter	1st quarter	4th quarter	3rd quarter	2nd quarter	1st quarter
Selected income statement data								
Total net revenue[(a)]	**$ 29,257**	**$ 29,647**	**$ 30,479**	**$ 32,266**	$ 29,335	$ 29,255	$ 33,075	$ 28,286
Total noninterest expense	**17,888**	**17,063**	**17,667**	**18,725**	16,048	16,875	16,942	16,791
Pre-provision profit[(b)]	**11,369**	**12,584**	**12,812**	**13,541**	13,287	12,380	16,133	11,495
Provision for credit losses	**(1,288)**	**(1,527)**	**(2,285)**	**(4,156)**	(1,889)	611	10,473	8,285
Income before income tax expense	**12,657**	**14,111**	**15,097**	**17,697**	15,176	11,769	5,660	3,210
Income tax expense[(a)]	**2,258**	**2,424**	**3,149**	**3,397**	3,040	2,326	973	345
Net income	**$ 10,399**	**$ 11,687**	**$ 11,948**	**$ 14,300**	$ 12,136	$ 9,443	$ 4,687	$ 2,865

(a) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
(b) Pre-provision profit is a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 58-60 for a discussion of these measures.

Distribution of assets, liabilities and stockholders' equity; interest rates and interest differentials

Consolidated average balance sheets, interest and rates

Provided below is a summary of JPMorgan Chase's consolidated average balances, interest and rates on a taxable-equivalent basis for the years 2019 through 2021. Income computed on a taxable-equivalent basis is the income reported in the Consolidated statements of income, adjusted to present interest income and rates earned on assets exempt from income taxes (i.e., federal taxes) on a basis comparable with other taxable investments. The incremental tax rate used for calculating the taxable-equivalent adjustment was approximately 24% in 2021, 2020 and 2019.

(Table continued on next page)

(Unaudited)	2021					
Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	Average balance		Interest[h]		Rate	
Assets						
Deposits with banks	$ 719,772		$ 512		0.07 %	
Federal funds sold and securities purchased under resale agreements	269,231		958		0.36	
Securities borrowed	190,655		(385)		(0.20)	(j)
Trading assets – debt instruments	283,829		6,856		2.42	
Taxable securities	563,147		6,460		1.15	
Non-taxable securities[a]	30,830		1,336		4.33	
Total investment securities	593,977		7,796		1.31	(k)
Loans	1,035,399		41,663	(i)	4.02	
All other interest-earning assets[b]	123,079		894		0.73	
Total interest-earning assets	3,215,942		58,294		1.81	
Allowance for loan losses	(22,179)					
Cash and due from banks	26,776					
Trading assets – equity and other instruments	172,822					
Trading assets – derivative receivables	69,101					
Goodwill, MSRs and other intangible assets	55,003					
All other noninterest-earning assets[c]	207,737					
Total assets	$ 3,725,202					
Liabilities						
Interest-bearing deposits	$ 1,694,865		$ 531		0.03 %	
Federal funds purchased and securities loaned or sold under repurchase agreements	259,302		274		0.11	
Short-term borrowings[d]	44,618		126		0.28	
Trading liabilities – debt and all other interest-bearing liabilities[e][f]	241,431		257		0.11	(j)
Beneficial interests issued by consolidated VIEs	14,595		83		0.57	
Long-term debt	250,378		4,282		1.71	
Total interest-bearing liabilities	2,505,189		5,553		0.22	
Noninterest-bearing deposits	652,289					
Trading liabilities – equity and other instruments[f]	36,656					
Trading liabilities – derivative payables	60,318					
All other liabilities, including the allowance for lending-related commitments[c]	186,755					
Total liabilities	3,441,207					
Stockholders' equity						
Preferred stock	33,027					
Common stockholders' equity	250,968					
Total stockholders' equity	283,995	(g)				
Total liabilities and stockholders' equity	$ 3,725,202					
Interest rate spread					1.59 %	
Net interest income and net yield on interest-earning assets			$ 52,741		1.64	

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(b) Includes brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated Balance Sheets.
(c) Prior-period amounts have been revised to conform with the current presentation. Refer to Note 25 for further information.
(d) Includes commercial paper.
(e) All other interest-bearing liabilities include brokerage-related customer payables.

Within the Consolidated average balance sheets, interest and rates summary, the principal amounts of nonaccrual loans have been included in the average loan balances used to determine the average interest rate earned on loans. Refer to Note 12 for additional information on nonaccrual loans, including interest accrued.

(Table continued from previous page)

2020			2019		
Average balance	Interest[h]	Rate	Average balance	Interest[h]	Rate
$ 444,058	$ 749	0.17 %	$ 280,004	$ 3,887	1.39 %
275,926	2,436	0.88	275,429	6,146	2.23
143,472	(302)	(0.21) [j]	131,291	1,574	1.20
322,936	7,869	2.44	294,958	9,189	3.12
476,650	7,843	1.65	284,127	7,962	2.80
33,287	1,437	4.32	35,748	1,655	4.63
509,937	9,280	1.82 [k]	319,875	9,617	3.01 [k]
1,004,597	43,886 [i]	4.37	989,943	52,012 [i]	5.25
78,784	1,023	1.30	53,779	2,146	3.99
2,779,710	64,941	2.34	2,345,279	84,571	3.61
(25,775)			(13,331)		
22,241			20,645		
120,878 [l]			114,323		
73,749 [l]			53,786		
51,934			53,683		
179,413			166,718		
$ 3,202,150			$ 2,741,103		
$ 1,389,224	$ 2,357	0.17 %	$ 1,115,848	$ 8,957	0.80 %
255,421	1,058	0.41	227,994	4,630	2.03
38,853	372	0.96	52,426	1,248	2.38
205,255	195	0.10 [j]	182,105	2,585	1.42
19,216	214	1.12	22,501	568	2.52
254,400	5,764	2.27	247,968	8,807	3.55
2,162,369	9,960	0.46	1,848,842	26,795	1.45
517,527			407,219		
32,628			31,085		
61,593			42,560		
161,269			150,979		
2,935,386			2,480,685		
29,899			27,511		
236,865			232,907		
266,764 [g]			260,418 [g]		
$ 3,202,150			$ 2,741,103		
		1.88 %			2.16 %
	$ 54,981	1.98		$ 57,776	2.46

(f) The combined balance of trading liabilities – debt and equity instruments was $128.2 billion, $106.5 billion and $101.0 billion for the years ended December 31, 2021, 2020 and 2019, respectively.

(g) The ratio of average stockholders' equity to average assets was 7.6%, 8.3% and 9.5% for the years ended December 31, 2021, 2020 and 2019, respectively. The return on average stockholders' equity, based on net income, was 17.0%, 10.9% and 14.0% for the years ended December 31, 2021, 2020 and 2019, respectively.

(h) Interest includes the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable.

(i) Fees and commissions on loans included in loan interest amounted to $1.9 billion, $1.0 billion and $1.2 billion for the years ended December 31, 2021, 2020 and 2019.

(j) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(k) The annualized rate for securities based on amortized cost was 1.33%, 1.85% and 3.05% for the years ended December 31, 2021, 2020 and 2019, respectively, and does not give effect to changes in fair value that are reflected in AOCI.

(l) Prior-period amounts have been revised to conform with the current presentation.

Interest rates and interest differential analysis of net interest income – U.S. and non-U.S.

Presented below is a summary of interest and rates segregated between U.S. and non-U.S. operations for the years 2019 through 2021. The segregation of U.S. and non-U.S. components is based on the location of the office recording the transaction. Intercompany funding generally consists of dollar-denominated deposits originated in various locations that are centrally managed by Treasury and CIO.

(Table continued on next page)

(Unaudited) Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	2021 Average balance	 Interest	 Rate
Interest-earning assets			
Deposits with banks:			
U.S.	$ 527,340	$ 693	0.13 %
Non-U.S.	192,432	(181)	(0.09)
Federal funds sold and securities purchased under resale agreements:			
U.S.	114,406	299	0.26
Non-U.S.	154,825	659	0.43
Securities borrowed:[a]			
U.S.	137,752	(319)	(0.23)
Non-U.S.	52,903	(66)	(0.12)
Trading assets – debt instruments:			
U.S.	158,793	3,530	2.22
Non-U.S.	125,036	3,326	2.66
Investment securities:			
U.S.	563,109	7,399	1.31
Non-U.S.	30,868	397	1.29
Loans:			
U.S.	924,713	39,215	4.24
Non-U.S.	110,686	2,448	2.21
All other interest-earning assets, predominantly U.S.	123,079	894	0.73
Total interest-earning assets	3,215,942	58,294	1.81
Interest-bearing liabilities			
Interest-bearing deposits:			
U.S.	1,323,812	901	0.07
Non-U.S.	371,053	(370)	(0.10)
Federal funds purchased and securities loaned or sold under repurchase agreements:			
U.S.	199,220	222	0.11
Non-U.S.	60,082	52	0.09
Trading liabilities – debt, short-term and all other interest-bearing liabilities:[a][b]			
U.S.	176,466	(345)	(0.20)
Non-U.S.	109,583	728	0.66
Beneficial interests issued by consolidated VIEs, predominantly U.S.	14,595	83	0.57
Long-term debt:			
U.S.	244,850	4,229	1.73
Non-U.S.	5,528	53	0.96
Intercompany funding:			
U.S.	(116,317)	(1,229)	–
Non-U.S.	116,317	1,229	–
Total interest-bearing liabilities	2,505,189	5,553	0.22
Noninterest-bearing liabilities[c]	710,753		
Total investable funds	$ 3,215,942	$ 5,553	0.17 %
Net interest income and net yield:		$ 52,741	1.64 %
U.S.		46,622	1.86
Non-U.S.		6,119	0.87
Percentage of total assets and liabilities attributable to non-U.S. operations:			
Assets			24.6
Liabilities			20.4

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
(b) Includes commercial paper.
(c) Represents the amount of noninterest-bearing liabilities funding interest-earning assets.

Refer to the "Net interest income" discussion in Consolidated Results of Operations on pages 52-54 for further information.

(Table continued from previous page)

2020			2019		
Average balance	Interest	Rate	Average balance	Interest	Rate
$ 294,669	$ 768	0.26 %	$ 165,066	$ 3,588	2.17 %
149,389	(19)	(0.01)	114,938	299	0.26
141,409	1,341	0.95	150,205	4,068	2.71
134,517	1,095	0.81	125,224	2,078	1.66
100,026	(305)	(0.30)	92,625	1,423	1.54
43,446	3	0.01	38,666	151	0.39
216,025	5,056	2.34	200,811	6,157	3.07
106,911	2,813	2.63	94,147	3,032	3.22
475,832	8,703	1.83	287,961	8,963	3.11
34,105	577	1.69	31,914	654	2.05
909,850	41,708	4.58	898,570	49,058	5.46
94,747	2,178	2.30	91,373	2,954	3.23
78,784	1,023	1.30	53,779	2,146	3.99
2,779,710	64,941	2.34	2,345,279	84,571	3.61
1,068,857	2,288	0.21	850,493	6,896	0.81
320,367	69	0.02	265,355	2,061	0.78
204,958	863	0.42	164,284	3,989	2.43
50,463	195	0.39	63,710	641	1.01
151,120	(30)	(0.02)	147,247	2,574	1.75
92,988	597	0.64	87,284	1,259	1.44
19,216	214	1.12	22,501	568	2.52
247,623	5,704	2.30	241,914	8,766	3.62
6,777	60	0.89	6,054	41	0.68
(46,327)	(1,254)	–	(42,947)	(1,414)	–
46,327	1,254	–	42,947	1,414	–
2,162,369	9,960	0.46	1,848,842	26,795	1.45
617,341			496,437		
$ 2,779,710	$ 9,960	0.36 %	$ 2,345,279	$ 26,795	1.14 %
	$ 54,981	1.98 %		$ 57,776	2.46 %
	49,242	2.25		52,217	2.86
	5,739	0.97		5,559	1.07
		23.5			24.5
		20.9			22.1

Changes in net interest income, volume and rate analysis

The table below presents an attribution of net interest income between volume and rate. The attribution between volume and rate is calculated using annual average balances for each category of assets and liabilities shown in the table and the corresponding annual rates (refer to pages 300-304 for more information on average balances and rates). In this analysis, when the change cannot be isolated to either volume or rate, it has been allocated to volume. The annual rates include the impact of changes in market rates, as well as the impact of any change in composition of the various products within each category of asset or liability. This analysis is calculated separately for each category without consideration of the relationship between categories (for example, the net spread between the rates earned on assets and the rates paid on liabilities that fund those assets). As a result, changes in the granularity or groupings considered in this analysis would produce a different attribution result, and due to the complexities involved, precise allocation of changes in interest rates between volume and rates is inherently complex and judgmental.

(Unaudited)	2021 versus 2020			2020 versus 2019		
	Increase/(decrease) due to change in:			Increase/(decrease) due to change in:		
Year ended December 31, (On a taxable-equivalent basis; in millions)	Volume	Rate	Net change	Volume	Rate	Net change
Interest-earning assets						
Deposits with banks:						
U.S.	**$ 308**	**$ (383)**	**$ (75)**	$ 333	$ (3,153)	$ (2,820)
Non-U.S.	**(42)**	**(120)**	**(162)**	(8)	(310)	(318)
Federal funds sold and securities purchased under resale agreements:						
U.S.	**(66)**	**(976)**	**(1,042)**	(83)	(2,644)	(2,727)
Non-U.S.	**75**	**(511)**	**(436)**	81	(1,064)	(983)
Securities borrowed:[(a)]						
U.S.	**(84)**	**70**	**(14)**	(24)	(1,704)	(1,728)
Non-U.S.	**(13)**	**(56)**	**(69)**	(1)	(147)	(148)
Trading assets – debt instruments:						
U.S.	**(1,267)**	**(259)**	**(1,526)**	365	(1,466)	(1,101)
Non-U.S.	**481**	**32**	**513**	336	(555)	(219)
Investment securities:						
U.S.	**1,170**	**(2,474)**	**(1,304)**	3,426	(3,686)	(260)
Non-U.S.	**(44)**	**(136)**	**(180)**	38	(115)	(77)
Loans:						
U.S.	**600**	**(3,093)**	**(2,493)**	557	(7,907)	(7,350)
Non-U.S.	**355**	**(85)**	**270**	74	(850)	(776)
All other interest-earning assets, predominantly U.S.	**320**	**(449)**	**(129)**	324	(1,447)	(1,123)
Change in interest income	**1,793**	**(8,440)**	**(6,647)**	5,418	(25,048)	(19,630)
Interest-bearing liabilities						
Interest-bearing deposits:						
U.S.	**109**	**(1,496)**	**(1,387)**	495	(5,103)	(4,608)
Non-U.S.	**(55)**	**(384)**	**(439)**	25	(2,017)	(1,992)
Federal funds purchased and securities loaned or sold under repurchase agreements:						
U.S.	**(6)**	**(635)**	**(641)**	176	(3,302)	(3,126)
Non-U.S.	**8**	**(151)**	**(143)**	(51)	(395)	(446)
Trading liabilities – debt, short-term and all other interest-bearing liabilities:[(a)(b)]						
U.S.	**(43)**	**(272)**	**(315)**	2	(2,606)	(2,604)
Non-U.S.	**112**	**19**	**131**	36	(698)	(662)
Beneficial interests issued by consolidated VIEs, predominantly U.S.	**(27)**	**(104)**	**(131)**	(37)	(317)	(354)
Long-term debt:						
U.S.	**(64)**	**(1,411)**	**(1,475)**	131	(3,193)	(3,062)
Non-U.S.	**(12)**	**5**	**(7)**	6	13	19
Intercompany funding:						
U.S.	**(739)**	**764**	**25**	(89)	249	160
Non-U.S.	**739**	**(764)**	**(25)**	89	(249)	(160)
Change in interest expense	**22**	**(4,429)**	**(4,407)**	783	(17,618)	(16,835)
Change in net interest income	**$ 1,771**	**$ (4,011)**	**$ (2,240)**	$ 4,635	$ (7,430)	$ (2,795)

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
(b) Includes commercial paper.

Glossary of Terms and Acronyms

2021 Form 10-K: Annual report on Form 10-K for the year ended December 31, 2021, filed with the U.S. Securities and Exchange Commission.

ABS: Asset-backed securities

AFS: Available-for-sale

ALCO: Asset Liability Committee

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

AUC: Assets under custody

AUM: "Assets under management": Represent assets managed by AWM on behalf of its Private Banking, Institutional and Retail clients. Includes "Committed capital not Called."

Auto loan and lease origination volume: Dollar amount of auto loans and leases originated.

AWM: Asset & Wealth Management

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that JPMorgan Chase consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

CB: Commercial Banking

CBB: Consumer & Business Banking

CCAR: Comprehensive Capital Analysis and Review

CCB: Consumer & Community Banking

CCO: Chief Compliance Officer

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes a counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CECL: Current Expected Credit Losses

CEO: Chief Executive Officer

CET1 Capital: Common equity Tier 1 capital

CFO: Chief Financial Officer

CFP: Contingency funding plan

CFTC: Commodity Futures Trading Commission

Chase Bank USA, N.A.: Chase Bank USA, National Association

CIB: Corporate & Investment Bank

CIO: Chief Investment Office

Client assets: Represent assets under management as well as custody, brokerage, administration and deposit accounts.

Client deposits and other third-party liabilities: Deposits, as well as deposits that are swept to on-balance sheet liabilities (e.g., commercial paper, federal funds purchased and securities loaned or sold under repurchase agreements) as part of client cash management programs.

CLO: Collateralized loan obligations

CLTV: Combined loan-to-value

CMT: Constant Maturity Treasury

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

Commercial Card: provides a wide range of payment services to corporate and public sector clients worldwide through the commercial card products. Services include procurement, corporate travel and entertainment, expense management services, and business-to-business payment solutions.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes.

CRO: Chief Risk Officer

CTC: CIO, Treasury and Corporate

Custom lending: Loans to AWM's Global Private Bank clients, including loans to private investment funds and loans that are collateralized by nontraditional asset types, such as art work, aircraft, etc.

CVA: Credit valuation adjustment

Debit and credit card sales volume: Dollar amount of card member purchases, net of returns.

Deposit margin/deposit spread: Represents net interest income expressed as a percentage of average deposits.

Distributed denial-of-service attack: The use of a large number of remote computer systems to electronically send a high volume of traffic to a target website to create a service outage at the target. This is a form of cyberattack.

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DVA: Debit valuation adjustment

EC: European Commission

Eligible HQLA: Eligible high-quality liquid assets, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule.

Eligible LTD: Long-term debt satisfying certain eligibility criteria

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

EPS: Earnings per share

ERISA: Employee Retirement Income Security Act of 1974

ETD: "Exchange-traded derivatives": Derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Expense categories:

- Volume- and/or revenue-related expenses generally correlate with changes in the related business/transaction volume or revenue. Examples include commissions and incentive compensation within the LOBs, depreciation expense related to operating lease assets, and brokerage expense related to trading transaction volume.
- Investments in the business include expenses associated with supporting medium- to longer-term strategic plans of the Firm. Examples include front office growth, market expansion, initiatives in technology (including related compensation), marketing, and acquisitions.
- Structural expenses are those associated with the day-to-day cost of running the Firm and are expenses not included in the above two categories. Examples include employee salaries and benefits, certain other incentive compensation, and costs related to real estate.

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FCC: Firmwide Control Committee

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICC: The Fixed Income Clearing Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

FINRA: Financial Industry Regulatory Authority

Firm: JPMorgan Chase & Co.

Forward points: Represents the interest rate differential between two currencies, which is either added to or subtracted from the current exchange rate (i.e., "spot rate") to determine the forward exchange rate.

FRC: Firmwide Risk Committee

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: a derivative contract entered into either separate and apart from any of the Firm's other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

FSB: Financial Stability Board

FTE: Fully taxable equivalent

FVA: Funding valuation adjustment

FX: Foreign exchange

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government bonds: Bonds issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

GSIB: Global systemically important banks

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where JPMorgan Chase holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where JPMorgan Chase holds a security interest that is subordinate in rank to other liens.

Households: A household is a collection of individuals or entities aggregated together by name, address, tax identifier and phone number.

HQLA: "High-quality liquid assets" consist of cash and certain high-quality liquid securities as defined in the LCR rule.

HTM: Held-to-maturity

IBOR: Interbank Offered Rate

ICAAP: Internal capital adequacy assessment process

IDI: Insured depository institutions

IHC: JPMorgan Chase Holdings LLC, an intermediate holding company

Investment-grade: An indication of credit quality based on JPMorgan Chase's internal risk assessment. The Firm considers ratings of BBB-/Baa3 or higher as investment-grade.

IPO: Initial public offering

ISDA: International Swaps and Derivatives Association

JPMorgan Chase: JPMorgan Chase & Co.

JPMorgan Chase Bank, N.A.: JPMorgan Chase Bank, National Association

JPMorgan Chase Foundation or the Firm's Foundation: A not-for-profit organization that makes contributions for charitable and educational purposes.

JPMorgan Securities: J.P. Morgan Securities LLC

LCR: Liquidity coverage ratio

LDA: Loss Distribution Approach

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LOB: Line of business

LOB CROs: Line of Business and CTC Chief Risk Officers

LTIP: Long-term incentive plan

LTV: "Loan-to-value": For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio
The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio
An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio
The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

Managed basis: A non-GAAP presentation of Firmwide financial results that includes reclassifications to present revenue on a fully taxable-equivalent basis. Management also uses this financial measure at the segment level, because it believes this provides information to enable investors to understand the underlying operational performance and trends of the particular business segment and facilitates a comparison of the business segment with the performance of competitors.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

MD&A: Management's discussion and analysis

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Merchant Services: offers merchants payment processing capabilities, fraud and risk management, data and analytics, and other payments services. Through Merchant Services, merchants of all sizes can accept payments via credit and debit cards and payments in multiple currencies.

MEV: Macroeconomic variable

MMLF: Money Market Mutual Fund Liquidity Facility

Moody's: Moody's Investor Services

Mortgage origination channels:

Retail – Borrowers who buy or refinance a home through direct contact with a mortgage banker employed by the Firm using a branch office, the Internet or by phone. Borrowers are frequently referred to a mortgage banker by a banker in a Chase branch, real estate brokers, home builders or other third parties.

Correspondent – Banks, thrifts, other mortgage banks and other financial institutions that sell closed loans to the Firm.

Mortgage product types:
Alt-A
Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of the Firm's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs
The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime
Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime
Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

Multi-asset: Any fund or account that allocates assets under management to more than one asset class.

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

Net Capital Rule: Rule 15c3-1 under the Securities Exchange Act of 1934.

Net charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net interchange income includes the following components:

- **Interchange income**: Fees earned by credit and debit card issuers on sales transactions.
- **Reward costs:** The cost to the Firm for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- **Partner payments**: Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

Net mortgage servicing revenue: Includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Net revenue rate: Represents Credit Card net revenue (annualized) expressed as a percentage of average loans for the period.

Net yield on interest-earning assets: The average rate for interest-earning assets less the average rate paid for all sources of funds.

NFA: National Futures Association

NM: Not meaningful

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S.

government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

Nonperforming assets: Nonperforming assets include nonaccrual loans, nonperforming derivatives and certain assets acquired in loan satisfaction, predominantly real estate owned and other commercial and personal property.

NOW: Negotiable Order of Withdrawal

NSFR: Net Stable Funding Ratio

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OPEB: Other postretirement employee benefit

Over-the-counter ("OTC") derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared ("OTC-cleared") derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

Overhead ratio: Noninterest expense as a percentage of total net revenue.

Parent Company: JPMorgan Chase & Co.

Participating securities: Represents unvested share-based compensation awards containing nonforfeitable rights to dividends or dividend equivalents (collectively, "dividends"), which are included in the earnings per share calculation using the two-class method. JPMorgan Chase grants RSUs to certain employees under its share-based compensation programs, which entitle the recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock. These unvested awards meet the definition of participating securities. Under the two-class method, all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities, based on their respective rights to receive dividends.

PCA: Prompt corrective action

PCAOB: Public Company Accounting Oversight Board

PCD: **"Purchased credit deteriorated"** assets represent acquired financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Firm.

PD: Probability of default

PPP: Paycheck Protection Program under the Small Business Association ("SBA")

PRA: Prudential Regulation Authority

Pre-provision profit/(loss): Represents total net revenue less noninterest expense. The Firm believes that this financial measure is useful in assessing the ability of a lending institution to generate income in excess of its provision for credit losses.

Pre-tax margin: Represents income before income tax expense divided by total net revenue, which is, in management's view, a comprehensive measure of pretax performance derived by measuring earnings after all costs are taken into consideration. It is one basis upon which management evaluates the performance of AWM against the performance of their respective competitors.

Principal transactions revenue: Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

Production revenue: Includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

PSUs: Performance share units

Regulatory VaR: Daily aggregated VaR calculated in accordance with regulatory rules.

REO: Real estate owned

Reported basis: Financial statements prepared under U.S. GAAP, which excludes the impact of taxable-equivalent adjustments.

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

Revenue wallet: Proportion of fee revenue based on estimates of investment banking fees generated across the industry (i.e., the revenue wallet) from investment banking transactions in M&A, equity and debt underwriting, and loan syndications. Source: Dealogic, a third-party provider of investment banking competitive analysis and volume-based league tables for the above noted industry products.

RHS: Rural Housing Service of the U.S. Department of Agriculture

ROA: Return on assets

ROE: Return on equity

ROTCE: Return on tangible common equity

ROU assets: Right-of-use assets

RSU(s): Restricted stock units

RWA: "Risk-weighted assets": Basel III establishes two comprehensive approaches for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

S&P: Standard and Poor's 500 Index

SA-CCR: Standardized Approach for Counterparty Credit Risk

SAR as it pertains to Hong Kong: Special Administrative Region

SAR(s) as it pertains to employee stock awards: Stock appreciation rights

SCB: Stress Capital Buffer

Scored portfolios: Consumer loan portfolios that predominantly include residential real estate loans, credit card loans, auto loans to individuals and certain small business loans.

SEC: Securities and Exchange Commission

Securities financing agreements: Include resale, repurchase, securities borrowed and securities loaned agreements

Seed capital: Initial JPMorgan capital invested in products, such as mutual funds, with the intention of ensuring the fund is of sufficient size to represent a viable offering to clients, enabling pricing of its shares, and allowing the manager to develop a track record. After these goals are achieved, the intent is to remove the Firm's capital from the investment.

Shelf securities: Securities registered with the SEC under a shelf registration statement that have not been issued, offered or sold. These securities are not included in league tables until they have actually been issued.

Single-name: Single reference-entities

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOFR: Secured Overnight Financing Rate

SPEs: Special purpose entities

Structural interest rate risk: Represents interest rate risk of the non-trading assets and liabilities of the Firm.

Structured notes: Structured notes are financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates, underlying reference pool of loans or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

Taxable-equivalent basis: In presenting results on a managed basis, the total net revenue for each of the business segments and the Firm is presented on a tax-equivalent basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in managed basis results on a level comparable to taxable investments and securities; the corresponding income tax impact related to tax-exempt items is recorded within income tax expense.

TBVPS: Tangible book value per share

TCE: Tangible common equity

TDR: "Troubled debt restructuring" is deemed to occur when the Firm modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

TLAC: Total loss-absorbing capacity

U.K.: United Kingdom

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises ("U.S. GSEs"). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. GSE(s): "U.S. government-sponsored enterprises" are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VaR: "Value-at-risk" is a measure of the dollar amount of potential loss from adverse market moves in an ordinary market environment.

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as loans.

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3 Corporate Governance & Nominating Committee
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Alibaba Group
Hong Kong, China

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Vice Chairman
National Committee of the Chinese People's Political Consultative Conference
Hong Kong, China

Jaime Augusto Zobel de Ayala
Chairman
Ayala Corporation
Makati City, Philippines

*Ex-officio

Corporate headquarters

383 Madison Avenue
New York, NY 10179-0001
Telephone: 212-270-6000
jpmorganchase.com

Annual Report on Form 10-K

The Annual Report on Form 10-K of JPMorgan Chase & Co. as filed with the U.S. Securities and Exchange Commission will be made available without charge upon request to:

Office of the Secretary
JPMorgan Chase & Co.
4 New York Plaza
New York, NY 10004-2413

Stock listing

New York Stock Exchange

The New York Stock Exchange ticker symbol for the common stock of JPMorgan Chase & Co. is JPM.

Financial information about JPMorgan Chase & Co. can be accessed by visiting the Investor Relations website at jpmorganchase.com. Additional questions should be addressed to:

Investor Relations
JPMorgan Chase & Co.
277 Park Avenue
New York, NY 10172-0003
Telephone: 212-270-2479
JPMCinvestorrelations@jpmchase.com

Directors

To contact any of the Board members or committee chairs, the Lead Independent Director or the non-management directors as a group, please mail correspondence to:

JPMorgan Chase & Co.
Attention (Board member(s))
Office of the Secretary
4 New York Plaza
New York, NY 10004-2413

The Corporate Governance Principles, the charters of the principal standing Board committees, the Code of Conduct, the Code of Ethics for Finance Professionals and other governance information can be accessed by visiting our website at jpmorganchase.com and clicking on "Governance" under the "Who We Are" tab. The Code of Conduct is available in print upon request to the JPMorgan Chase Investor Relations Department. Within the time period required by the SEC, the Firm will post on its website any amendment to the Code of Conduct and any waiver applicable to a director or executive officer.

Transfer agent and registrar

Computershare
462 South 4th Street
Suite 1600
Louisville, KY 40202
United States
Telephone: 800-758-4651
www.computershare.com/investor

Investor Services Program

JPMorgan Chase & Co.'s Investor Services Program offers a variety of convenient, low-cost services to make it easier to reinvest dividends and buy and sell shares of JPMorgan Chase & Co. common stock. A brochure and enrollment materials may be obtained by contacting the Program Administrator, Computershare, by calling 800-758-4651, by writing to the address indicated above or by visiting its website at www-us.computershare.com/investor.

Direct deposit of dividends

For information about direct deposit of dividends, please contact Computershare.

Stockholder inquiries

Contact Computershare:

By telephone:

Within the United States, Canada and Puerto Rico: 800-758-4651 (toll free)

From all other locations: 201-680-6862 (collect)

TDD service for the hearing impaired within the United States, Canada and Puerto Rico: 800-231-5469 (toll free)

All other locations: 201-680-6610 (collect)

By regular mail:

Computershare
P.O. Box 505000
Louisville, KY 40233
United States

By overnight delivery:

Computershare
462 South 4th Street
Suite 1600
Louisville, KY 40202
United States

Duplicate mailings

If you receive duplicate mailings because you have more than one account listing and you wish to consolidate your accounts, please write to Computershare at the address above.

Independent registered public accounting firm

PricewaterhouseCoopers LLP
300 Madison Avenue
New York, NY 10017

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