CITIGROUP INC
Form 10-K
February 22, 2019

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K
ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF
THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018
Commission file number 1-9924
Citigroup Inc.
(Exact name of registrant as specified in its charter)

Delaware	52-1568099
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
388 Greenwich Street, New York, NY	10013
(Address of principal executive offices)	(Zip code)

(212) 559-1000
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act: See Exhibit 99.01

Securities registered pursuant to Section 12(g) of the Act: none

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes o No x
Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes o No x
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No o
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x No o
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant’s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. x
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and “emerging growth company” in Rule 12b-2 of the Exchange Act.

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. Yes o
Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes o No x
The aggregate market value of Citigroup Inc. common stock held by non-affiliates of Citigroup Inc. on June 30, 2018 was approximately $168.1 billion.
Number of shares of Citigroup Inc. common stock outstanding on January 31, 2019: 2,351,523,709

Documents Incorporated by Reference: Portions of the registrant's proxy statement for the annual meeting of stockholders scheduled to be held on April 16, 2019 are incorporated by reference in this Form 10-K in response to Items 10, 11, 12, 13 and 14 of Part III.
Available on the web at www.citigroup.com

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15. Exhibits and Financial Statement Schedules

*	For additional information regarding Citigroup's Directors, see "Corporate Governance," "Proposal 1: Election of Directors" and "Section 16(a) Beneficial Ownership Reporting Compliance" in the definitive Proxy Statement for Citigroup's Annual Meeting of Stockholders scheduled to be held on April 16, 2019, to be filed with the SEC (the Proxy Statement), incorporated herein by reference.
**	See "Compensation Discussion and Analysis," "The Personnel and Compensation Committee Report," "2018 Summary Compensation Table and Compensation Information" and "CEO Pay Ratio" in the Proxy Statement, incorporated herein by reference.
***	See "About the Annual Meeting," "Stock Ownership" and "Equity Compensation Plan Information" in the Proxy Statement, incorporated herein by reference.
****	See "Corporate Governance—Director Independence," "—Certain Transactions and Relationships, Compensation Committee Interlocks and Insider Participation" and "—Indebtedness" in the Proxy Statement, incorporated herein by reference.
*****	See "Proposal 2: Ratification of Selection of Independent Registered Public Accounting Firm" in the Proxy Statement, incorporated herein by reference.

CITIGROUP'S 2018 ANNUAL REPORT ON FORM 10-K

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OVERVIEW

Citigroup's history dates back to the founding of the City
Bank of New York in 1812.
Citigroup is a global diversified financial services holding company whose businesses provide consumers, corporations, governments and institutions with a broad, yet focused, range of financial products and services, including consumer banking and credit, corporate and investment banking, securities brokerage, trade and securities services and wealth management. Citi has approximately 200 million customer accounts and does business in more than 160 countries and jurisdictions.
At December 31, 2018, Citi had approximately 204,000 full-time employees, compared to approximately 209,000 full-time employees at December 31, 2017.
Citigroup currently operates, for management reporting purposes, via two primary business segments: Global Consumer Banking and Institutional Clients Group, with the remaining operations in Corporate/Other. For a further description of the business segments and the products and services they provide, see "Citigroup Segments" below, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and Note 3 to the Consolidated Financial Statements.
Throughout this report, "Citigroup," "Citi" and "the Company" refer to Citigroup Inc. and its consolidated subsidiaries.
Additional information about Citigroup is available on Citi's website at www.citigroup.com. Citigroup's recent annual reports on Form 10-K, quarterly reports on Form 10-Q and proxy statements, as well as other filings with the U.S. Securities and Exchange Commission (SEC), are available free of charge through Citi's website by clicking on the "Investors" page and selecting "All SEC Filings." The SEC's website also contains current reports on Form 8-K and other information regarding Citi at www.sec.gov.
Certain reclassifications, including a realignment of certain businesses, have been made to the prior periods' financial statements to conform to the current period's presentation. For information on certain recent such reclassifications, see Note 3 to the Consolidated Financial Statements.

Please see "Risk Factors" below for a discussion of the most significant risks and uncertainties that could impact Citigroup's businesses, financial condition and results of operations.

As described above, Citigroup is managed pursuant to two business segments: Global Consumer Banking and Institutional Clients Group, with the remaining operations in Corporate/Other.
The following are the four regions in which Citigroup operates. The regional results are fully reflected in the segment results above.

(1) Latin America GCB consists of Citi's consumer banking business in Mexico.
(2) Asia GCB includes the results of operations of GCB activities in certain EMEA countries for all periods presented.
(3) North America includes the U.S., Canada and Puerto Rico, Latin America includes Mexico and Asia includes Japan.

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

EXECUTIVE SUMMARY

As described further throughout this Executive Summary, Citi made steady progress in 2018 toward improving its profitability and returns, despite a more challenging revenue environment, particularly in certain market-sensitive businesses and given macroeconomic uncertainties. During 2018, Citi reported 3% underlying revenue growth in Global Consumer Banking (GCB) and Institutional Clients Group (ICG), excluding the impact of gains on sale in 2018 and 2017 (see "Citigroup" below). Citi had solid revenue growth across treasury and trade solutions, private bank, securities services, equity markets and corporate lending in ICG, partially offset by weakness in fixed income as well as softness in equity and debt underwriting. Citi reported revenue growth in all regions in GCB, reflecting continued loan and overall deposit growth, partially offset by the near-term impact of weak market sentiment on Asia wealth management revenues, as well as the impact from partnership renewal terms that went into effect in 2018 in Citi-branded cards in North America GCB.

Citi demonstrated strong expense discipline, resulting in a 1% decrease in expenses, as well as positive operating leverage, even as Citi continued to make ongoing investments. Citi's positive operating leverage, combined with continued credit discipline, resulted in an improvement in pretax earnings. Citi also generated continued loan and deposit growth during the year.

Moreover, Citi continued to return capital to its shareholders. In 2018, Citi returned $18.4 billion in the form of common stock repurchases and dividends. Citi repurchased over 200 million shares during the last year, resulting in an 8% reduction in outstanding common shares. While Citi made continued progress in returning capital to shareholders, each of Citi's key regulatory capital metrics remained strong (see "Capital" below).

Going into 2019, while global economic growth has continued and the underlying macroeconomic environment remains largely positive, there continue to be various economic, political and other risks and uncertainties that could create a more volatile operating environment and impact Citi's businesses and future results. For a more detailed discussion of the risks and uncertainties that could impact Citi's businesses, results of operations and financial condition during 2019, see each respective business's results of operations, "Risk Factors" and "Managing Global Risk" below. Despite these risks and uncertainties, Citi intends to continue to build on the progress made during 2018 with a focus on further optimizing its performance to benefit shareholders, while remaining flexible and adapting to market and economic conditions as they develop.

2018 Summary Results

Citigroup

Citigroup reported net income of $18.0 billion, or $6.68 per share, compared to a net loss of $6.8 billion, or $2.98 per share, in the prior year. Results in 2017 included a one-time,

non-cash charge of $22.6 billion, related to the enactment of the Tax Cuts and Jobs Act (Tax Reform), which impacted the tax line within Corporate/Other, as well as the tax lines in North America GCB and ICG. Results in 2018 included a one-time benefit of $94 million, due to the finalization of the provisional component of the impact based on Citi's analysis as well as additional guidance received from the U.S. Treasury Department related to Tax Reform, which impacted the tax line within Corporate/Other (for additional information, see "Significant Accounting Policies and Estimates—Income Taxes" below).

Excluding the one-time impact of Tax Reform in both the current and prior year, Citigroup net income of $18.0 billion increased 14% compared to the prior year, reflecting a lower effective tax rate, higher revenues and lower expenses, partially offset by higher cost of credit. On this basis, earnings per share increased 25%, due to growth in net income and the 8% reduction in average shares outstanding, driven by the common stock repurchases. (Citi's results of operations excluding the impact of Tax Reform are non-GAAP financial measures. Citi believes the presentation of its results of operations excluding the one-time impact of Tax Reform in both the current and prior year provides a meaningful depiction for investors of the underlying fundamentals of its businesses.)

Citigroup revenues of $72.9 billion in 2018 increased 1%, as 3% growth in GCB and 1% growth in ICG were largely offset by a 33% decrease in Corporate/Other, primarily due to the continued wind-down of legacy assets. Results in 2017 included a one-time gain (approximately $580 million) on the sale of a fixed income analytics business in ICG, and results in 2018 included a one-time gain (approximately $250 million) on the sale of an asset management business in Latin America GCB. Excluding the gains on sale in both periods, aggregate revenues in ICG and GCB grew 3% from the prior year.

Citigroup's end-of-period loans increased 3% to $684 billion versus the prior year. Excluding the impact of foreign currency translation into U.S. dollars for reporting purposes (FX translation), Citigroup's end-of-period loans grew 4%, as 8% growth in ICG and 3% growth in GCB were partially offset by the continued wind-down of legacy assets in Corporate/Other. (Citi's results of operations excluding the impact of gains on sales and FX translation are non-GAAP financial measures. Citi believes the presentation of its results of operations excluding the impact of gains on sales and FX translation provides a meaningful depiction for investors of the underlying fundamentals of its businesses.)

Citigroup's end-of-period deposits increased 6% to $1.0 trillion versus the prior year. Excluding the impact of FX translation, Citigroup's deposits were up 7%, primarily reflecting a 10% increase in ICG and a 1% increase in GCB.

Expenses

Citigroup operating expenses of $41.8 billion decreased 1% versus the prior year, as efficiency savings and the wind-down of legacy assets more than offset the impact of higher volume-

related expenses and ongoing investments. Operating expenses in both ICG and GCB were up 3%, while Corporate/Other operating expenses declined 40%, all versus the prior year.

Cost of Credit

Citi's total provisions for credit losses and for benefits and claims of $7.6 billion increased 2% from the prior year, driven by higher net loan loss reserve builds and higher net credit losses. The net loan loss reserve build of $354 million compared to a net loan loss reserve build of $266 million in the prior year. The increase largely reflected a modest net loan loss reserve build in ICG, compared to a net loan loss reserve release in the prior year, partially offset by lower net loan loss reserve builds in North America GCB.

Net credit losses of $7.1 billion increased 1% versus the prior year. Consumer net credit losses increased 4% to $6.9 billion, largely reflecting volume growth and seasoning in the North America cards portfolios, partially offset by the continued wind-down of legacy assets in Corporate/Other. Corporate net credit losses decreased 55% to $169 million, primarily reflecting the impact of an episodic charge-off incurred in the prior year.

For additional information on Citi's consumer and corporate credit costs and allowance for loan losses, see each respective business's results of operations and "Credit Risk" below.

Capital

Citigroup's Common Equity Tier 1 Capital and Tier 1 Capital ratios were 11.9% and 13.5% as of December 31, 2018, respectively, compared to 12.4% and 14.1% as of December 31, 2017, both based on the Basel III Standardized Approach for determining risk-weighted assets. The decline in regulatory capital largely reflected the return of capital to common shareholders, partially offset by earnings growth. Citigroup's Supplementary Leverage ratio as of December 31, 2018 was 6.4%, compared to 6.7% as of December 31, 2017. For additional information on Citi's capital ratios and related components, see "Capital Resources" below.

Global Consumer Banking

GCB net income of $5.8 billion increased 49%. Excluding the one-time impact of Tax Reform in the prior year, GCB net income increased 25%, driven primarily by a lower effective tax rate and higher revenues, partially offset by higher expenses. Operating expenses were $18.6 billion, up 3%, as higher volume-related expenses and continued investments were partially offset by efficiency savings.

GCB revenues of $33.8 billion increased 3% versus the prior year, driven by growth across all regions. North America GCB revenues increased 1% to $20.5 billion, driven by higher revenues across all businesses. Citi-branded cards revenues of $8.6 billion were up 1% versus the prior year, as growth in interest-earning balances was largely offset by the previously disclosed impact of partnership renewal terms. Citi retail services revenues of $6.6 billion increased 3% versus the prior year, primarily reflecting organic loan growth and the benefit of the L.L.Bean portfolio acquisition, partially offset by higher partner payments. Retail banking revenues increased 1% from

the prior year to $5.3 billion. Excluding mortgage revenues, retail banking revenues of $4.8 billion were up 6% from the prior year, driven by continued growth in deposit margins, partially offset by lower deposit volumes.

North America GCB average deposits of $180 billion decreased a net 2% year-over-year, primarily driven by a reduction in money market balances, as clients transferred money to investments. North America GCB average retail loans of $56 billion grew 1% from the prior year. Assets under management of $60 billion were largely unchanged from the prior year, as 5% underlying growth was offset by the impact of market movements, due to the equity market sell-off at the end of 2018. Average Citi-branded card loans of $88 billion increased 4%, while Citi-branded card purchase sales of $344 billion increased 8% versus the prior year. Average Citi retail services loans of $48 billion increased 6% versus the prior year, while Citi retail services purchase sales of $87 billion were up 7%. For additional information on the results of operations of North America GCB for 2018, see "Global Consumer Banking—North America GCB" below.

International GCB revenues (consisting of Latin America GCB and Asia GCB (which includes the results of operations in certain EMEA countries)) increased 5% versus the prior year to $13.2 billion. Excluding the impact of FX translation, international GCB revenues increased 6% versus the prior year. Latin America GCB revenues

increased 13% versus the prior year, including the gain on sale in 2018. Excluding the gain on sale, Latin America GCB revenues increased 8%, driven by growth in loans and deposits as well as improved deposit spreads. Asia GCB revenues increased 2% versus the prior year, as continued growth in deposit, cards and insurance revenues was largely offset by lower investment revenues due to weak market sentiment. For additional information on the results of operations of Latin America GCB and Asia GCB for 2018, including the impact of FX translation, see “Global Consumer Banking—Latin America GCB” and “Global Consumer Banking—Asia GCB” below.

Year-over-year, international GCB average deposits of $127 billion increased 4%, average retail loans of $90 billion increased 3%, assets under management of $98 billion decreased 1%, average card loans of $24 billion increased 2% and card purchase sales of $104 billion increased 7%, all excluding the impact of FX translation.

Institutional Clients Group

ICG net income of $12.2 billion increased 35%. Excluding the one-time impact of Tax Reform in the prior year, ICG net income increased 11%, driven by a lower effective tax rate and higher revenues, partially offset by higher operating expenses and higher cost of credit. ICG operating expenses increased 3% to $21.0 billion, as higher compensation costs, volume-related expenses and continued investments were partially offset by efficiency savings.

ICG revenues were $37.0 billion in 2018, up 1% from the prior year, as a 6% increase in Banking revenues was largely offset by a 3% decrease in Markets and securities services, including the impact of the gain on sale in the prior year. Excluding the gain on sale in the prior year, revenues increased 3%, primarily driven by a 6% increase in Banking

revenues, as Markets and securities services revenues were largely unchanged versus the prior year. The increase in Banking revenues included the impact of $45 million of gains on loan hedges within corporate lending, compared to losses of $133 million in the prior year.

Banking revenues of $19.9 billion (excluding the impact of gains (losses) on loan hedges within corporate lending) increased 5%, driven by solid growth in treasury and trade solutions, private bank and corporate lending, partially offset by lower revenues in investment banking. Investment banking revenues of $5.0 billion decreased 7% versus the prior year, as growth in advisory was more than offset by a decline in both debt and equity underwriting, largely reflecting lower market activity. Advisory revenues increased 16% to $1.3 billion, equity underwriting revenues decreased 12% to $991 million and debt underwriting revenues decreased 13% to $2.7 billion, all versus the prior year.

Treasury and trade solutions revenues of $9.3 billion increased 8% versus the prior year, reflecting volume growth and improved deposit spreads, with solid growth across net interest and fee income. Private bank revenues increased 9% to $3.4 billion from the prior year, driven by growth in investments, as well as improved deposit spreads. Corporate lending revenues increased 26% to $2.3 billion. Excluding the impact of gains (losses) on loan hedges, corporate lending revenues increased 15% versus the prior year, primarily driven by loan growth and lower hedging costs.

Markets and securities services revenues of $17.0 billion decreased 3% from the prior year. Excluding the gain on sale in the prior year, Markets and securities services revenues were largely unchanged from the prior year, as a decline in fixed income markets revenues was offset by an increase in both equity markets and securities services revenues.

Fixed income markets revenues of $11.6 billion decreased 6% from the prior year, driven by lower revenues in both rates and currencies and spread products, reflecting the more challenging environment. Equity markets revenues of $3.4 billion increased 19% from the prior year (14% excluding an episodic loss in derivatives in the prior year), driven by growth in derivatives and prime finance as well as higher investor client revenue, partially offset by a modest decline in cash equities. Securities services revenues of $2.6 billion increased 11%, driven by growth in client volumes and higher interest revenue. For additional information on the results of operations of ICG for 2018, see “Institutional Clients Group” below.

Corporate/Other

Corporate/Other net income was $107 million in 2018, compared to a net loss of $19.7 billion in the prior year. Excluding the one-time impact of Tax Reform in both periods, Corporate/Other net income declined 92% to $13 million, largely reflecting lower revenues, partially offset by lower operating expenses and lower cost of credit.

Operating expenses of $2.3 billion declined 40% from the prior year, largely reflecting the wind-down of legacy assets, lower infrastructure costs and lower legal expenses. Corporate/Other revenues were $2.1 billion, down 33% from the prior year, primarily reflecting the continued wind-down of legacy assets. For additional information on the results of operations of Corporate/Other for 2018, see “Corporate/Other” below.

RESULTS OF OPERATIONS
SUMMARY OF SELECTED FINANCIAL DATA—PAGE 1
Citigroup Inc. and Consolidated Subsidiaries

In millions of dollars, except per share amounts and ratios	2018	2017	2016	2015	2014
Net interest revenue	$46,562	$45,061	$45,476	$47,093	$48,445
Non-interest revenue	26,292	27,383	25,321	30,184	29,731
Revenues, net of interest expense	$72,854	$72,444	$70,797	$77,277	$78,176
Operating expenses	41,841	42,232	42,338	44,538	56,008
Provisions for credit losses and for benefits and claims	7,568	7,451	6,982	7,913	7,467
Income from continuing operations before income taxes	$23,445	$22,761	$21,477	$24,826	$14,701
Income taxes[1]	5,357	29,388	6,444	7,440	7,197
Income (loss) from continuing operations	$18,088	$(6,627)	$15,033	$17,386	$7,504
Income (loss) from discontinued operations, net of taxes[2]	(8)	(111)	(58)	(54)	(2)
Net income (loss) before attribution of noncontrolling interests	$18,080	$(6,738)	$14,975	$17,332	$7,502
Net income attributable to noncontrolling interests	35	60	63	90	192
Citigroup's net income (loss)[1]	$18,045	$(6,798)	$14,912	$17,242	$7,310
Less:					
Preferred dividends—Basic	$1,173	$1,213	$1,077	$769	$511
Dividends and undistributed earnings allocated to employee restricted and deferred shares that contain nonforfeitable rights to dividends, applicable to basic EPS	200	37	195	224	110
Income (loss) allocated to unrestricted common shareholders for basic and diluted EPS	$16,672	$(8,048)	$13,640	$16,249	$6,689
Earnings per share					
Basic					
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74	$5.43	$2.21
Net income (loss)	6.69	(2.98)	4.72	5.41	2.21
Diluted					
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74	$5.42	$2.20
Net income (loss)	6.68	(2.98)	4.72	5.40	2.20
Dividends declared per common share	1.54	0.96	0.42	0.16	0.04

Table continues on the next page, including footnotes.

SUMMARY OF SELECTED FINANCIAL DATA—PAGE 2

In millions of dollars, except per share amounts, ratios and direct staff	2018	2017	2016	2015	2014
At December 31:					
Total assets	$1,917,383	$1,842,465	$1,792,077	$1,731,210	$1,842,181
Total deposits	1,013,170	959,822	929,406	907,887	899,332
Long-term debt	231,999	236,709	206,178	201,275	223,080
Citigroup common stockholders' equity[1]	177,760	181,487	205,867	205,139	199,717
Total Citigroup stockholders' equity[1]	196,220	200,740	225,120	221,857	210,185
Direct staff (in thousands)	204	209	219	231	241
Performance metrics					
Return on average assets	0.94 %	(0.36)%	0.82 %	0.95 %	0.39 %
Return on average common stockholders' equity[1][3]	9.4	(3.9)	6.6	8.1	3.4
Return on average total stockholders' equity[1][3]	9.1	(3.0)	6.5	7.9	3.5
Efficiency ratio (total operating expenses/total revenues)	57.4	58.3	59.8	57.6	71.6
Basel III ratios—full implementation[1][4]					
Common Equity Tier 1 Capital[5]	11.86 %	12.36 %	12.57 %	12.07 %	10.57 %
Tier 1 Capital[5]	13.46	14.06	14.24	13.49	11.45
Total Capital[5]	16.18	16.30	16.24	15.30	12.80
Supplementary Leverage ratio	6.41	6.68	7.22	7.08	5.94
Citigroup common stockholders' equity to assets[1]	9.27 %	9.85 %	11.49 %	11.85 %	10.84 %
Total Citigroup stockholders' equity to assets[1]	10.23	10.90	12.56	12.82	11.41
Dividend payout ratio[6]	23.1	NM	8.9	3.0	1.8
Total payout ratio[7]	109.1	NM	77.1	36.0	19.9
Book value per common share[1]	$75.05	$70.62	$74.26	$69.46	$66.05
Tangible book value (TBV) per share[1][8]	63.79	60.16	64.57	60.61	56.71

(1) 2017 includes the one-time impact related to the enactment of Tax Reform. 2018 reflects the tax rate structure under Tax Reform. For additional information, see "Significant Accounting Policies and Estimates—Income Taxes" below.

(2) See Note 2 to the Consolidated Financial Statements for additional information on Citi's discontinued operations.

(3) The return on average common stockholders' equity is calculated using net income less preferred stock dividends divided by average common stockholders' equity. The return on average total Citigroup stockholders' equity is calculated using net income divided by average Citigroup stockholders' equity.

(4) Citi's risk-based capital and leverage ratios for 2017 and prior years are non-GAAP financial measures, which reflect full implementation of regulatory capital adjustments and deductions prior to the effective date of January 1, 2018.

(5) As of December 31, 2018 and 2017, Citi's reportable Common Equity Tier 1 Capital and Tier 1 Capital ratios were the lower derived under the Basel III Standardized Approach, whereas the reportable Total Capital ratio was the lower derived under the Basel III Advanced Approaches framework. For all prior periods presented, Citi's Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios were the lower derived under the Basel III Advanced Approaches framework.

(6) Dividends declared per common share as a percentage of net income per diluted share.

(7) Total common dividends declared plus common stock repurchases as a percentage of net income available to common shareholders. See "Consolidated Statement of Changes in Stockholders' Equity," Note 10 to the Consolidated Financial Statements and "Equity Security Repurchases" below for the component details.

(8)

For information on TBV, see “Capital Resources—Tangible Common Equity, Book Value Per Share, Tangible Book Value Per Share and Returns on Equity” below.

NM Not meaningful

SEGMENT AND BUSINESS—INCOME (LOSS) AND REVENUES
CITIGROUP INCOME

In millions of dollars	2018	2017[1]	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Income (loss) from continuing operations					
Global Consumer Banking					
North America	$3,340	$1,990	$3,239	68 %	(39)%
Latin America	928	610	633	52	(4)
Asia[2]	1,494	1,278	1,059	17	21
Total	$5,762	$3,878	$4,931	49 %	(21)%
Institutional Clients Group					
North America	$3,500	$2,355	$3,515	49 %	(33)%
EMEA	3,891	2,832	2,345	37	21
Latin America	1,889	1,544	1,454	22	6
Asia	2,920	2,335	2,211	25	6
Total	$12,200	$9,066	$9,525	35 %	(5)%
Corporate/Other	$126	$(19,571)	$577	NM	NM
Income (loss) from continuing operations	$18,088	$(6,627)	$15,033	NM	NM
Discontinued operations	$(8)	$(111)	$(58)	93 %	(91)%
Net income attributable to noncontrolling interests	35	60	63	(42)	(5)
Citigroup’s net income (loss)	$18,045	$(6,798)	$14,912	NM	NM

(1) 2017 includes the one-time impact related to the enactment of Tax Reform. For additional information, see “Significant Accounting Policies and Estimates—Income Taxes” below.

(2) Asia GCB includes the results of operations of GCB activities in certain EMEA countries for all periods presented.

NM Not meaningful

CITIGROUP REVENUES

In millions of dollars	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Global Consumer Banking					
North America	$20,544	$20,270	$19,764	1 %	3 %
Latin America	5,760	5,222	4,971	10	5
Asia[1]	7,473	7,346	6,889	2	7
Total	$33,777	$32,838	$31,624	3 %	4 %
Institutional Clients Group					
North America	$12,914	$13,923	$12,767	(7)%	9 %
EMEA	11,770	10,879	10,012	8	9
Latin America	4,504	4,385	4,125	3	6
Asia	7,806	7,287	7,036	7	4
Total	$36,994	$36,474	$33,940	1 %	7 %
Corporate/Other	$2,083	$3,132	$5,233	(33)%	(40)%
Total Citigroup net revenues	$72,854	$72,444	$70,797	1 %	2 %

(1) Asia GCB includes the results of operations of GCB activities in certain EMEA countries for all periods presented.

SEGMENT BALANCE SHEET[1]

In millions of dollars	Global Consumer Banking	Institutional Clients Group	Corporate/Other and consolidating eliminations[2]	Citigroup parent company-issued long-term debt and stockholders' equity[3]	Total Citigroup consolidated
Assets					
Cash and deposits with banks	$8,338	$66,963	$ 112,804	$—	$188,105
Federal funds sold and securities borrowed and purchased under agreements to resell	140	270,322	222	—	270,684
Trading account assets	949	245,521	9,647	—	256,117
Investments	1,152	116,006	241,449	—	358,607
Loans, net of unearned income and allowance for loan losses	305,631	351,333	14,917	—	671,881
Other assets	37,551	99,638	34,800	—	171,989
Net inter-segment liquid assets[4]	78,378	244,387	(322,765)	—	—
Total assets	$432,139	$1,394,170	$ 91,074	$—	$1,917,383
Liabilities and equity					
Total deposits	$308,106	$689,983	$ 15,081	$—	$1,013,170
Federal funds purchased and securities loaned and sold under agreements to repurchase	4,459	173,302	7	—	177,768
Trading account liabilities	140	143,751	414	—	144,305
Short-term borrowings	491	22,381	9,474	—	32,346
Long-term debt[3]	1,865	42,557	43,809	143,768	231,999
Other liabilities	18,854	88,036	13,831	—	120,721
Net inter-segment funding (lending)[3]	98,224	234,160	7,604	(339,988)	—
Total liabilities	$432,139	$1,394,170	$ 90,220	$(196,220)	$1,720,309
Total stockholders' equity[5]	—	—	854	196,220	197,074
Total liabilities and equity	$432,139	$1,394,170	$ 91,074	$—	$1,917,383

(1) The supplemental information presented in the table above reflects Citigroup's consolidated GAAP balance sheet by reporting segment as of December 31, 2018. The respective segment information depicts the assets and liabilities managed by each segment as of such date.

(2) Consolidating eliminations for total Citigroup and Citigroup parent company assets and liabilities are recorded within Corporate/Other.

(3) The total stockholders' equity and the majority of long-term debt of Citigroup reside in the Citigroup parent company Consolidated Balance Sheet. Citigroup allocates stockholders' equity and long-term debt to its businesses through inter-segment allocations as shown above.

(4) Represents the attribution of Citigroup's liquidity assets (primarily consisting of cash, marketable equity securities and available-for-sale debt securities) to the various businesses based on Liquidity Coverage Ratio (LCR) assumptions.

(5) Corporate/Other equity represents noncontrolling interests.

GLOBAL CONSUMER BANKING

Global Consumer Banking (GCB) consists of consumer banking businesses in North America, Latin America (consisting of Citi's consumer banking business in Mexico) and Asia. GCB provides traditional banking services to retail customers through retail banking, including commercial banking, and Citi-branded cards and Citi retail services (for additional information on these businesses, see "Citigroup Segments" above and "Managing Global Risk—Consumer Credit" below). GCB is focused on its priority markets in the U.S., Mexico and Asia with 2,410 branches in 19 countries and jurisdictions as of December 31, 2018. Asia GCB also includes traditional retail banking and Citi-branded card products that are provided to retail customers in certain EMEA countries. At December 31, 2018, GCB had approximately $432 billion in assets and $308 billion in deposits.

GCB's overall strategy is to leverage Citi's global footprint and be the pre-eminent bank for the emerging affluent and affluent consumers in large urban centers. In credit cards and in certain retail markets (including commercial banking), Citi serves customers in a somewhat broader set of segments and geographies.

In millions of dollars, except as otherwise noted	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net interest revenue	$28,583	$27,425	$26,232	4 %	5 %
Non-interest revenue	5,194	5,413	5,392	(4)	—
Total revenues, net of interest expense	$33,777	$32,838	$31,624	3 %	4 %
Total operating expenses	$18,590	$18,003	$17,627	3 %	2 %
Net credit losses	$6,920	$6,562	$5,610	5 %	17 %
Credit reserve build (release)	563	965	708	(42)	36
Provision (release) for unfunded lending commitments	—	(2)	3	100	NM
Provision for benefits and claims	103	116	106	(11)	9
Provisions for credit losses and for benefits and claims (LLR & PBC)	$7,586	$7,641	$6,427	(1)%	19 %
Income from continuing operations before taxes	$7,601	$7,194	$7,570	6 %	(5)%
Income taxes	1,839	3,316	2,639	(45)	26
Income from continuing operations	$5,762	$3,878	$4,931	49 %	(21)%
Noncontrolling interests	7	9	7	(22)	29
Net income	$5,755	$3,869	$4,924	49 %	(21)%
Balance Sheet data and ratios (in billions of dollars)					
Total EOP assets	$432	$428	$411	1 %	4 %
Average assets	423	417	395	1	6
Return on average assets	1.36 %	0.93 %	1.25 %		
Efficiency ratio	55	55	56		
Average deposits	$307	$306	$298	—	3
Net credit losses as a percentage of average loans	2.26 %	2.21 %	2.01 %		
Revenue by business					
Retail banking	$14,065	$13,481	$12,990	4 %	4 %
Cards[1]	19,712	19,357	18,634	2	4
Total	$33,777	$32,838	$31,624	3 %	4 %
Income from continuing operations by business					
Retail banking	$2,304	$1,656	$1,538	39 %	8 %
Cards[1]	3,458	2,222	3,393	56	(35)
Total	$5,762	$3,878	$4,931	49 %	(21)%

Table continues on the next page, including footnotes.

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Foreign currency (FX) translation impact					
Total revenue—as reported	$33,777	$32,838	$31,624	3 %	4 %
Impact of FX translation(2)	—	(132)	(54)		
Total revenues—ex-FX(3)	$33,777	$32,706	$31,570	3 %	4 %
Total operating expenses—as reported	$18,590	$18,003	$17,627	3 %	2 %
Impact of FX translation(2)	—	(54)	7		
Total operating expenses—ex-FX(3)	$18,590	$17,949	$17,634	4 %	2 %
Total provisions for LLR & PBC—as reported	$7,586	$7,641	$6,427	(1)%	19 %
Impact of FX translation(2)	—	(32)	(31)		
Total provisions for LLR & PBC—ex-FX(3)	$7,586	$7,609	$6,396	— %	19 %
Net income—as reported	$5,755	$3,869	$4,924	49 %	(21)%
Impact of FX translation(2)	—	(28)	(19)		
Net income—ex-FX(3)	$5,755	$3,841	$4,905	50 %	(22)%

(1) Includes both Citi-branded cards and Citi retail services.

(2) Reflects the impact of FX translation into U.S. dollars at the 2018 average exchange rates for all periods presented.

(3) Presentation of this metric excluding FX translation is a non-GAAP financial measure.

NORTH AMERICA GCB

North America GCB provides traditional retail banking, including commercial banking, Citi-branded cards products and Citi retail services card products to retail customers and small to mid-size businesses, as applicable, in the U.S. North America GCB's U.S. cards product portfolio includes its proprietary portfolio (including the Citi Double Cash, Thank You and Value cards) and co-branded cards (including, among others, American Airlines and Costco) within Citi-branded cards, as well as its co-brand and private label relationships (including, among others, Sears, The Home Depot, Best Buy and Macy's) within Citi retail services.

As of December 31, 2018, North America GCB's 689 retail bank branches were concentrated in the six key metropolitan areas of New York, Chicago, Miami, Washington, D.C., Los Angeles and San Francisco. Also as of December 31, 2018, North America GCB had approximately 9.1 million retail banking customer accounts, $56.8 billion in retail banking loans and $181.2 billion in deposits. In addition, North America GCB had approximately 121 million Citi-branded and Citi retail services credit card accounts with $144.5 billion in outstanding card loan balances.

In millions of dollars, except as otherwise noted	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net interest revenue	$19,621	$18,879	$18,131	4 %	4 %
Non-interest revenue	923	1,391	1,633	(34)	(15)
Total revenues, net of interest expense	$20,544	$20,270	$19,764	1 %	3 %
Total operating expenses	$10,631	$10,245	$10,067	4 %	2 %
Net credit losses	$5,097	$4,796	$3,919	6 %	22 %
Credit reserve build	438	869	653	(50)	33
Provision for unfunded lending commitments	—	4	6	(100)	(33)
Provision for benefits and claims	22	33	34	(33)	(3)
Provisions for credit losses and for benefits and claims	$5,557	$5,702	$4,612	(3)%	24 %
Income from continuing operations before taxes	$4,356	$4,323	$5,085	1 %	(15)%
Income taxes	1,016	2,333	1,846	(56)	26
Income from continuing operations	$3,340	$1,990	$3,239	68 %	(39)%
Noncontrolling interests	—	(1)	(2)	100	50
Net income	$3,340	$1,991	$3,241	68 %	(39)%
Balance Sheet data and ratios (in billions of dollars)					
Average assets	$249	$248	$229	— %	8 %
Return on average assets	1.34 %	0.80 %	1.42 %		
Efficiency ratio	52	51	51		
Average deposits	$180.4	$184.1	$183.2	(2)	—
Net credit losses as a percentage of average loans	2.66 %	2.58 %	2.29 %		
Revenue by business					
Retail banking	$5,315	$5,264	$5,227	1 %	1 %
Citi-branded cards	8,628	8,579	8,150	1	5
Citi retail services	6,601	6,427	6,387	3	1
Total	$20,544	$20,270	$19,764	1 %	3 %
Income from continuing operations by business					
Retail banking	$565	$412	$534	37 %	(23)%
Citi-branded cards	1,581	1,009	1,441	57	(30)
Citi retail services	1,194	569	1,264	NM	(55)
Total	$3,340	$1,990	$3,239	68 %	(39)%

NM Not meaningful

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2018 vs. 2017

Net income increased 68%, largely reflecting the impact of the $750 million one-time, non-cash charge recorded in the tax line due to the impact of Tax Reform in 2017 (for additional information, see “Significant Accounting Policies and Significant Estimates—Income Taxes” below). Excluding the one-time impact of Tax Reform, net income increased 22%, driven primarily by a lower effective tax rate due to Tax Reform, higher revenues and lower cost of credit, partially offset by higher expenses.

Revenues increased 1%, driven by higher revenues across all businesses.

Retail banking revenues increased 1%. Excluding mortgage revenues (decline of 27%), retail banking revenues were up 6%, driven by continued growth in deposit margins, partially offset by lower deposit volumes. Average deposits decreased 2% year-over-year, primarily driven by a reduction in money market balances, as clients transferred money to investments. Assets under management were largely unchanged from the prior year as 5% underlying growth was offset by the impact of market movements, due to the equity market sell-off at the end of 2018. The decline in mortgage revenues was driven by lower origination activity and higher cost of funds, reflecting the higher interest rate environment.

Cards revenues increased 1%. In Citi-branded cards, revenues increased 1%, as growth in interest-earning balances, driven by maturity of recent vintages and strength in loan balance retention, was largely offset by the impact of previously disclosed partnership terms that went into effect in 2018. Citi sold its Hilton portfolio in the first quarter of 2018, which resulted in a gain of approximately $150 million. This gain was offset by the loss of operating revenue in the portfolio in 2018. Average loans increased 4% and purchase sales increased 8%.

Citi retail services revenues increased 3%, primarily reflecting organic loan growth and the benefit of the L.L.Bean portfolio acquisition in June 2018, partially offset by higher partner payments. Average loans increased 6% and purchase sales increased 7%.

Expenses increased 4%, as volume growth and ongoing investments were partially offset by efficiency savings.

Provisions decreased 3% from the prior year, driven by a lower net loan loss reserve build, partially offset by higher net credit losses. The net loan loss reserve build was $438 million in 2018, primarily reflecting volume growth and seasoning in both cards portfolios. This compares to a build of $873 million in the prior year, which included $300 million related to an increase in net flow rates in later delinquency buckets in Citi retail services and a slight increase in delinquencies for the Citi-branded cards portfolio.

Net credit losses increased 6% to $5.1 billion, driven by higher net credit losses in both Citi-branded cards (up 6% to $2.6 billion) and Citi retail services (up 9% to $2.4 billion). The increase in the cards net credit losses primarily reflected volume growth and seasoning in both portfolios.

For additional information on North America GCB’s retail banking, including commercial banking, and its Citi-branded cards and Citi retail services portfolios, see “Credit Risk—Consumer Credit” below.

As part of its Citi retail services business, Citi issues co-brand and private label credit card products with Sears. As previously disclosed, in October 2018, Sears filed for Chapter 11 bankruptcy protection and in connection with the filing Sears has closed, or announced plans to close, additional stores. On February 11, 2019, after bankruptcy court approval, ESL Investments, Inc. purchased substantially all of Sears’ assets on a going concern basis, including its credit card program agreement with Citi. The impact to Citi retail services, from reduced new account acquisitions or lower purchase sales, will depend in part on the magnitude and timing of additional Sears store closures and continued customer attrition. Citi does not currently expect that the sale of Sears to ESL will have an immediate or ongoing material impact on Citi’s consolidated results. For additional information on the potential impact from a deterioration in or failure to maintain Citi’s co-branding and private label credit card relationships, see “Risk Factors—Strategic Risks” below.

2017 vs. 2016

Net income decreased 39% largely due to the one-time impact of Tax Reform. Excluding the one-time impact of Tax Reform, net income decreased 15%, due to higher cost of credit and higher expenses, partially offset by higher revenues.

Revenues increased 3%, driven by higher revenues across all businesses.

Retail banking revenues increased 1%. Excluding mortgage revenues (down 32%), retail banking revenues were up 9%, driven by growth in checking deposits, loans (average loans up 3%) and assets under management (up 14%) and increased commercial banking activity, as well as a benefit from higher interest rates.

Cards revenues increased 3%. In Citi-branded cards, revenues increased 5%, primarily reflecting the acquisition of the Costco portfolio, as well as modest growth in interest-earning balances, partially offset by the continued run-off of non-core portfolios and the higher cost to fund growth in transactor and promotional balances.

Citi retail services revenues increased 1%, as loan growth was partially offset by the impact of the renewal and extension of certain partnerships within the portfolio, as well as the absence of gains on sales of two cards portfolios in 2016.

Expenses increased 2%, driven by the addition of the Costco portfolio, higher volume-related expenses and investments as well as remediation costs related to a CARD Act matter, partially offset by efficiency savings.

Provisions increased 24%, driven by higher net credit losses and a higher net loan loss reserve build.

Net credit losses increased 22%, largely driven by higher net credit losses in both cards portfolios, primarily reflecting volume growth and seasoning, as well as the impact of acquiring the Costco portfolio.

The net loan loss reserve build was $873 million, compared to a build of $659 million in the prior year, driven by volume growth and seasoning in both cards portfolios, as well as the increase in net flow rates in later delinquency buckets, primarily in Citi retail services.

LATIN AMERICA GCB

Latin America GCB provides traditional retail banking, including commercial banking, and its Citi-branded card products to retail customers and small to mid-size businesses in Mexico through Citibanamex, one of Mexico's largest banks.

At December 31, 2018, Latin America GCB had 1,463 retail branches in Mexico, with approximately 29.4 million retail banking customer accounts, $19.7 billion in retail banking loans and $27.7 billion in deposits. In addition, the business had approximately 5.6 million Citi-branded card accounts with $5.7 billion in outstanding loan balances.

In millions of dollars, except as otherwise noted	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net interest revenue	$4,058	$3,844	$3,606	6 %	7 %
Non-interest revenue[1]	1,702	1,378	1,365	24	1
Total revenues, net of interest expense	$5,760	$5,222	$4,971	10 %	5 %
Total operating expenses	$3,156	$2,959	$2,885	7 %	3 %
Net credit losses	$1,153	$1,117	$1,040	3 %	7 %
Credit reserve build	83	125	83	(34)	51
Provision (release) for unfunded lending commitments	—	(1)	1	100	NM
Provision for benefits and claims	81	83	72	(2)	15
Provisions for credit losses and for benefits and claims (LLR & PBC)	$1,317	$1,324	$1,196	(1)%	11 %
Income from continuing operations before taxes	$1,287	$939	$890	37 %	6 %
Income taxes	359	329	257	9	28
Income from continuing operations	$928	$610	$633	52 %	(4)%
Noncontrolling interests	—	5	5	(100)	—
Net income	$928	$605	$628	53 %	(4)%
Balance Sheet data and ratios (in billions of dollars)					
Average assets	$44	$45	$47	(2)%	(4)%
Return on average assets	2.11 %	1.34 %	1.34 %		
Efficiency ratio	55	57	58		
Average deposits	$28.7	$27.4	$25.7	5	7
Net credit losses as a percentage of average loans	4.47 %	4.42 %	4.32 %		
Revenue by business					
Retail banking[1]	$4,195	$3,752	$3,493	12 %	7 %
Citi-branded cards	1,565	1,470	1,478	6	(1)
Total	$5,760	$5,222	$4,971	10 %	5 %
Income from continuing operations by business					
Retail banking[1]	$722	$426	$352	69 %	21 %
Citi-branded cards	206	184	281	12	(35)
Total	$928	$610	$633	52 %	(4)%
FX translation impact					
Total revenues—as reported	$5,760	$5,222	$4,971	10 %	5 %
Impact of FX translation[2]	—	(105)	(145)		
Total revenues—ex-FX[3]	$5,760	$5,117	$4,826	13 %	6 %
Total operating expenses—as reported	$3,156	$2,959	$2,885	7 %	3 %
Impact of FX translation[2]	—	(50)	(66)		
Total operating expenses—ex-FX[3]	$3,156	$2,909	$2,819	8 %	3 %
Provisions for LLR & PBC—as reported	$1,317	$1,324	$1,196	(1)%	11 %
Impact of FX translation[2]	—	(27)	(34)		
Provisions for LLR & PBC—ex-FX[3]	$1,317	$1,297	$1,162	2 %	12 %
Net income—as reported	$928	$605	$628	53 %	(4)%

Impact of FX translation[2]	—	(19)	(30)		
Net income—ex-FX[3]	$928	$586	$598	58 %	(2)%

(1) 2018 includes an approximate $250 million gain on the sale of an asset management business. See Note 2 to the Consolidated Financial Statements.

(2) Reflects the impact of FX translation into U.S. dollars at the 2018 average exchange rates for all periods presented.

(3) Presentation of this metric excluding FX translation is a non-GAAP financial measure.

The discussion of the results of operations for Latin America GCB below excludes the impact of FX translation for all periods presented. Presentations of the results of operations, excluding the impact of FX translation, are non-GAAP financial measures. For a reconciliation of certain of these metrics to the reported results, see the table above.

2018 vs. 2017

Net income increased 58% to $928 million, reflecting higher revenues and a lower effective tax rate as a result of Tax Reform, partially offset by higher expenses and cost of credit.

Revenues increased 13%, including the gain on sale of an asset management business (approximately $250 million). Excluding the gain on sale, revenues were up 8%, driven by increases in both retail banking and cards.

Retail banking revenues increased 14%. Excluding the gain on sale, retail banking revenues increased 7%, driven by continued growth across commercial loans and deposits, as well as improved deposit spreads due to higher interest rates. Average loans grew 3%, and average deposits grew 6%, while assets under management declined 5%, primarily driven by market performance during the second half of 2018. Cards revenues increased 9%, due to continued volume growth, reflecting higher purchase sales (up 11%) and full-rate revolving loans. Average cards loans grew 6%.

Expenses increased 8%, driven by volume growth, ongoing investment spending and higher repositioning charges, partially offset by efficiency savings. As previously disclosed, Citi continues to execute on its investment plans for Citibanamex (totaling more than $1 billion through 2020), including initiatives to modernize the branch network, enhance digital capabilities and upgrade core operating platforms.

Provisions increased 2%, as higher net credit losses were largely offset by a lower net loan loss reserve build. The increase in net credit losses was primarily due to volume growth and seasoning in cards.

For additional information on Latin America GCB's retail banking, including commercial banking, and its Citi-branded cards portfolios, see "Credit Risk—Consumer Credit" below.

For additional information on potential macroeconomic and geopolitical challenges and other risks facing Latin America GCB, see "Risk Factors—Strategic Risks" below.

2017 vs. 2016

Net income decreased 2%, primarily driven by higher credit costs and expenses, partially offset by higher revenues.

Revenues increased 6%, driven by higher revenues in retail banking.

Retail banking revenues increased 8%, reflecting continued growth in volumes, including increases in average deposits (8%), average loans (6%) and assets under management (4%), as well as improved deposit spreads, driven by higher interest rates. Cards revenues were largely unchanged, as continued improvement in full-rate revolving loans was offset by a higher cost to fund non-revolving loans.

Expenses increased 3%, as ongoing investment spending and business growth were partially offset by efficiency savings.

Provisions increased 12%, primarily driven by higher net credit losses and an increase in the net loan loss reserve build, largely reflecting volume growth and seasoning, as well as a Mexico earthquake-related loan loss reserve build.

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ASIA GCB

Asia GCB provides traditional retail banking, including commercial banking, and its Citi-branded card products to retail customers and small to mid-size businesses, as applicable. During 2018, Asia GCB's most significant revenues were from Singapore, Hong Kong, Korea, India, Australia, Taiwan, Thailand, Philippines, Indonesia and Malaysia. Asia GCB also includes traditional retail banking and Citi-branded card products that are provided to retail customers in certain EMEA countries, primarily in Poland, Russia and the United Arab Emirates.

At December 31, 2018, on a combined basis, the businesses had 258 retail branches, approximately 16.0 million retail banking customer accounts, $69.2 billion in retail banking loans and $99.2 billion in deposits. In addition, the businesses had approximately 15.3 million Citi-branded card accounts with $19.3 billion in outstanding loan balances.

In millions of dollars, except as otherwise noted[1]	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net interest revenue	$4,904	$4,702	$4,495	4 %	5 %
Non-interest revenue	2,569	2,644	2,394	(3)	10
Total revenues, net of interest expense	$7,473	$7,346	$6,889	2 %	7 %
Total operating expenses	$4,803	$4,799	$4,675	— %	3 %
Net credit losses	$670	$649	$651	3 %	— %
Credit reserve build (release)	42	(29)	(28)	NM	(4)
Provision (release) for unfunded lending commitments	—	(5)	(4)	100	(25)
Provisions for credit losses	$712	$615	$619	16 %	(1)%
Income from continuing operations before taxes	$1,958	$1,932	$1,595	1 %	21 %
Income taxes	464	654	536	(29)	22
Income from continuing operations	$1,494	$1,278	$1,059	17 %	21 %
Noncontrolling interests	7	5	4	40	25
Net income	$1,487	$1,273	$1,055	17 %	21 %
Balance Sheet data and ratios (in billions of dollars)					
Average assets	$131	$124	$119	6 %	4 %
Return on average assets	1.14 %	1.03 %	0.89 %		
Efficiency ratio	64	65	68		
Average deposits	$98.0	$94.6	$89.5	4	6
Net credit losses as a percentage of average loans	0.76 %	0.76 %	0.77 %		
Revenue by business					
Retail banking	$4,555	$4,465	$4,270	2 %	5 %
Citi-branded cards	2,918	2,881	2,619	1	10
Total	$7,473	$7,346	$6,889	2 %	7 %
Income from continuing operations by business					
Retail banking	$1,017	$818	$652	24 %	25 %
Citi-branded cards	477	460	407	4	13
Total	$1,494	$1,278	$1,059	17 %	21 %

FX translation impact					
Total revenues—as reported	$7,473	$7,346	$6,889	2 %	7 %
Impact of FX translation[2]	—	(27)	91		
Total revenues—ex-FX[3]	$7,473	$7,319	$6,980	2 %	5 %
Total operating expenses—as reported	$4,803	$4,799	$4,675	— %	3 %
Impact of FX translation[2]	—	(4)	73		
Total operating expenses—ex-FX[3]	$4,803	$4,795	$4,748	— %	1 %
Provisions for credit losses—as reported	$712	$615	$619	16 %	(1)%
Impact of FX translation[2]	—	(5)	3		
Provisions for credit losses—ex-FX[3]	$712	$610	$622	17 %	(2)%
Net income—as reported	$1,487	$1,273	$1,055	17 %	21 %
Impact of FX translation[2]	—	(9)	11		
Net income—ex-FX[3]	$1,487	$1,264	$1,066	18 %	19 %

(1) Asia GCB includes the results of operations of GCB activities in certain EMEA countries for all periods presented.
(2) Reflects the impact of FX translation into U.S. dollars at the 2018 average exchange rates for all periods presented.
(3) Presentation of this metric excluding FX translation is a non-GAAP financial measure.

The discussion of the results of operations for Asia GCB below excludes the impact of FX translation for all periods presented. Presentations of the results of operations, excluding the impact of FX translation, are non-GAAP financial measures. For a reconciliation of certain of these metrics to the reported results, see the table above.

2018 vs. 2017

Net income increased 18%, reflecting higher revenues and a lower effective tax rate as a result of Tax Reform, partially offset by higher cost of credit.

Revenues increased 2%, driven by higher retail banking and cards revenues.

Retail banking revenues increased 2%, as continued growth in deposit and insurance revenues was partially offset by lower investment revenues due to weak market sentiment. Average deposits increased 3% and assets under management grew 1%, while investment sales decreased 8%. Retail lending revenues increased 1%, as volume growth in personal and commercial loans was largely offset by lower mortgage revenues due to spread compression. Average retail banking loans grew 3%.

Cards revenues increased 2%. Excluding the benefit of modest one-time gains in the prior year, revenues increased 4%, driven by continued growth in purchase sales (up 6%) and average loans (up 2%).

Expenses were largely unchanged, as volume-driven growth and ongoing investment spending were offset by efficiency savings.

Provisions increased 17%, primarily driven by higher net credit losses and a modest net loan loss reserve build compared to a modest net loan loss reserve release in the prior year due to volume growth. Overall credit quality continued to remain stable in the region.

For additional information on Asia GCB’s retail banking portfolios, including commercial banking, and its Citi-branded cards portfolio, see “Credit Risk—Consumer Credit” below.

2017 vs. 2016

Net income increased 19%, reflecting higher revenues and lower cost of credit, partially offset by higher expenses.

Revenues increased 5%, driven by improvement in cards and wealth management revenues, partially offset by continued lower retail lending revenues.

Retail banking revenues increased 3%, primarily due to higher investment revenues, driven by improved investor sentiment, partially offset by the repositioning of the retail loan portfolio. The lower retail lending revenues (down 4%) reflected lower average loans (down 1%) due to the continued optimization of the portfolio away from lower yielding mortgage loans.

Cards revenues increased 8%, reflecting 5% growth in average loans and 6% growth in purchase sales, both of which benefited from the portfolio acquisition in Australia, as well as modest gains related to sales of merchant acquiring businesses in certain countries.

Expenses increased 1%, resulting from volume-driven growth and ongoing investment spending, partially offset by efficiency savings.

Provisions decreased 2%, primarily driven by a decrease in net credit losses.

INSTITUTIONAL CLIENTS GROUP

Institutional Clients Group (ICG) includes Banking and Markets and securities services (for additional information on these businesses, see “Citigroup Segments” above). ICG provides corporate, institutional, public sector and high-net-worth clients around the world with a full range of wholesale banking products and services, including fixed income and equity sales and trading, foreign exchange, prime brokerage, derivative services, equity and fixed income research, corporate lending, investment banking and advisory services, private banking, cash management, trade finance and securities services. ICG transacts with clients in both cash instruments and derivatives, including fixed income, foreign currency, equity and commodity products.

ICG revenue is generated primarily from fees and spreads associated with these activities. ICG earns fee income for assisting clients with transactional services and clearing and providing brokerage and investment banking services and other such activities. Such fees are recognized at the point in time when Citigroup’s performance under the terms of a contractual arrangement is completed, which is typically at the trade/execution date or closing of a transaction. Revenue generated from these activities is recorded in Commissions and fees and Investment banking. Revenue is also generated from assets under custody and administration, which is recognized as/when the associated promised service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi. Revenue generated from these activities is primarily recorded in Administration and other fiduciary fees. For additional information on these various types of revenues, see Note 5 to the Consolidated Financial Statements.

In addition, as a market maker, ICG facilitates transactions, including holding product inventory to meet client demand, and earns the differential between the price at which it buys and sells the products. These price differentials and the unrealized gains and losses on the inventory are recorded in Principal transactions (for additional information on Principal transactions revenue, see Note 6 to the Consolidated Financial Statements). Other primarily includes mark-to-market gains and losses on certain credit derivatives, realized gains and losses on available-for-sale (AFS) debt securities, gains and losses on equity securities not held in trading accounts and other non-recurring gains and losses. Interest income earned on assets held, less interest paid on long- and short-term debt and to customers on deposits, is recorded as Net interest revenue.

The amount and types of Markets revenues are impacted by a variety of interrelated factors, including market liquidity; changes in market variables such as interest rates, foreign exchange rates, equity prices, commodity prices and credit spreads, as well as their implied volatilities; investor confidence and other macroeconomic conditions. Assuming all other market conditions do not change, increases in client activity levels or bid/offer spreads generally result in increases in revenues. However, changes in market conditions can significantly impact client activity levels, bid/offer spreads and the fair value of product inventory. For example, a decrease in

market liquidity may increase bid/offer spreads, decrease client activity levels and widen credit spreads on product inventory positions.

ICG’s management of the Markets businesses involves daily monitoring and evaluation of the above factors at the trading desk as well as the country level. ICG does not separately track the impact on total Markets revenues of the volume of transactions, bid/offer spreads, fair value changes of product inventory positions and economic hedges because, as noted above, these components are interrelated and are not deemed useful or necessary individually to manage the Markets businesses at an aggregate level.

In the Markets businesses, client revenues are those revenues directly attributable to client transactions at the time of inception, including commissions, interest or fees earned. Client revenues do not include the results of client facilitation activities (e.g., holding product inventory in anticipation of client demand) or the results of certain economic hedging activities.

ICG’s international presence is supported by trading floors in approximately 80 countries and a proprietary network in 98 countries and jurisdictions. At December 31, 2018, ICG had approximately $1.4 trillion of assets and $690 billion of deposits, while two of its businesses—securities services and issuer services—managed approximately $17.5 trillion of assets under custody as of December 31, 2018 and 2017.

In millions of dollars, except as otherwise noted	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Commissions and fees	$4,516	$4,318	$3,998	5 %	8 %
Administration and other fiduciary fees	2,755	2,668	2,448	3	9
Investment banking	4,352	4,661	3,868	(7)	21
Principal transactions	8,852	8,012	7,570	10	6
Other[1]	794	1,179	(143)	(33)	NM
Total non-interest revenue	$21,269	$20,838	$17,741	2 %	17 %
Net interest revenue (including dividends)	15,725	15,636	16,199	1	(3)
Total revenues, net of interest expense	$36,994	$36,474	$33,940	1 %	7 %
Total operating expenses	$20,979	$20,415	$19,669	3 %	4 %
Net credit losses	$172	$365	$516	(53)%	(29)%
Credit reserve build (release)	(104)	(221)	(64)	53	NM
Provision (release) for unfunded lending commitments	116	(159)	34	NM	NM
Provisions for credit losses	$184	$(15)	$486	NM	NM
Income from continuing operations before taxes	$15,831	$16,074	$13,785	(2)%	17 %
Income taxes	3,631	7,008	4,260	(48)	65
Income from continuing operations	$12,200	$9,066	$9,525	35 %	(5)%
Noncontrolling interests	17	57	58	(70)	(2)
Net income	$12,183	$9,009	$9,467	35 %	(5)%
EOP assets (in billions of dollars)	$1,394	$1,336	$1,277	4 %	5 %
Average assets (in billions of dollars)	1,404	1,358	1,298	3	5
Return on average assets	0.87 %	0.66 %	0.73 %		
Efficiency ratio	57	56	58		
Revenues by region					
North America	$12,914	$13,923	$12,767	(7)%	9 %
EMEA	11,770	10,879	10,012	8	9
Latin America	4,504	4,385	4,125	3	6
Asia	7,806	7,287	7,036	7	4
Total	$36,994	$36,474	$33,940	1 %	7 %
Income from continuing operations by region					
North America	$3,500	$2,355	$3,515	49 %	(33)%
EMEA	3,891	2,832	2,345	37	21
Latin America	1,889	1,544	1,454	22	6
Asia	2,920	2,335	2,211	25	6
Total	$12,200	$9,066	$9,525	35 %	(5)%
Average loans by region (in billions of dollars)					
North America	$165	$151	$145	9 %	4 %
EMEA	81	69	66	17	5
Latin America	34	34	35	—	(3)
Asia	66	62	57	6	9
Total	$346	$316	$303	9 %	4 %
EOP deposits by business (in billions of dollars)					
Treasury and trade solutions	$472	$432	$412	9 %	5 %
All other ICG businesses	218	208	200	5	4
Total	$690	$640	$612	8 %	5 %

(1)

2017 includes the approximate $580 million gain on the sale of a fixed income analytics business. 2016 includes a charge of approximately $180 million, primarily reflecting the write-down of Citi's net investment in Venezuela due to changes in the exchange rate.

NM Not meaningful

ICG Revenue Details—Excluding Gains (Losses) on Loan Hedges

In millions of dollars	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Investment banking revenue details					
Advisory	$1,301	$1,123	$1,013	16 %	11 %
Equity underwriting	991	1,121	663	(12)	69
Debt underwriting	2,719	3,126	2,776	(13)	13
Total investment banking	$5,011	$5,370	$4,452	(7)%	21 %
Treasury and trade solutions	9,289	8,635	8,022	8	8
Corporate lending—excluding gains (losses) on loan hedges[1]	2,232	1,938	1,734	15	12
Private bank	3,398	3,108	2,728	9	14
Total Banking revenues (ex-gains (losses) on loan hedges)	$19,930	$19,051	$16,936	5 %	12 %
Corporate lending—gains (losses) on loan hedges[1]	$45	$(133)	$(594)	NM	78 %
Total Banking revenues (including gains (losses) on loan hedges), net of interest expense	$19,975	$18,918	$16,342	6 %	16 %
Fixed income markets	$11,635	$12,351	$13,063	(6)%	(5)%
Equity markets	3,427	2,879	2,933	19	(2)
Securities services	2,631	2,366	2,181	11	8
Other[2]	(674)	(40)	(579)	NM	93
Total Markets and securities services revenues, net of interest expense	$17,019	$17,556	$17,598	(3)%	— %
Total revenues, net of interest expense	$36,994	$36,474	$33,940	1 %	7 %
Commissions and fees	$706	$641	$498	10 %	29 %
Principal transactions[3]	7,108	6,995	6,680	2	5
Other	380	596	595	(36)	—
Total non-interest revenue	$8,194	$8,232	$7,773	— %	6 %
Net interest revenue	3,441	4,119	5,290	(16)	(22)
Total fixed income markets	$11,635	$12,351	$13,063	(6)%	(5)%
Rates and currencies	$8,461	$8,885	$9,381	(5)%	(5)%
Spread products/other fixed income	3,174	3,466	3,682	(8)	(6)
Total fixed income markets	$11,635	$12,351	$13,063	(6)%	(5)%
Commissions and fees	$1,268	$1,271	$1,338	— %	(5)%
Principal transactions[3]	1,240	478	218	NM	NM
Other	109	7	139	NM	(95)
Total non-interest revenue	$2,617	$1,756	$1,695	49 %	4 %
Net interest revenue	810	1,123	1,238	(28)	(9)
Total equity markets	$3,427	$2,879	$2,933	19 %	(2)%

(1) Credit derivatives are used to economically hedge a portion of the corporate loan portfolio that includes both accrual loans and loans at fair value. Gains (losses) on loan hedges includes the mark-to-market on the credit derivatives and the mark-to-market on the loans in the portfolio that are at fair value. The fixed premium costs of these hedges are netted against the corporate lending revenues to reflect the cost of credit protection. Citigroup's results of operations excluding the impact of gains (losses) on loan hedges are non-GAAP financial measures.

(2) 2017 includes the approximate $580 million gain on the sale of a fixed income analytics business. 2016 includes a charge of approximately $180 million, primarily reflecting the write-down of Citi's net investment in Venezuela due to changes in the exchange rate.

(3)

Excludes principal transactions revenues of ICG businesses other than Markets and securities services, primarily treasury and trade solutions and the private bank.

NM Not meaningful

The discussion of the results of operations for ICG below excludes (where noted) the impact of gains (losses) on hedges of accrual loans, which are non-GAAP financial measures. For a reconciliation of these metrics to the reported results, see the table above.

2018 vs. 2017

Net income increased 35%, reflecting the impact of a $2.0 billion one-time, non-cash charge recorded in the tax line due to the impact of Tax Reform in 2017 (for additional information, see "Significant Accounting Policies and Significant Estimates—Income Taxes" below). Excluding the one-time impact of Tax Reform, net income increased 11%, driven primarily by a lower effective tax rate as a result of Tax Reform and higher revenues, partially offset by higher expenses and higher cost of credit.

- Revenues increased 1%, reflecting a 6% increase in Banking (including the gains (losses) on loan hedges), largely offset by a 3% decrease in Markets and securities services. Excluding the impact of a gain of approximately $580 million on the sale of a fixed income analytics business in the prior year, revenues increased 3%, primarily driven by a 6% increase in Banking revenue, as Markets and securities services revenues were largely unchanged versus the prior year. Excluding the impact of the gains (losses) on loan hedges, Banking revenues increased 5%, driven by solid growth across treasury and trade solutions, private bank and corporate lending. Excluding the gain on sale in the prior year, Markets and securities services revenues were largely unchanged, as increases in equity markets and securities services revenues were offset by a decrease in fixed income markets revenues. Citi expects that revenues in its markets and investment banking businesses will likely reflect the overall market environment during 2019.

Within Banking:

- Investment banking revenues decreased 7%, largely reflecting a decline in market wallet and market share across debt and equity underwriting as well as the comparison to the particularly strong performance in the prior year. Advisory revenues increased 16%, reflecting strength in North America, driven by gains in wallet share and increased market activity. Equity underwriting revenues decreased 12%, primarily driven by lower revenues in EMEA. Debt underwriting revenues decreased 13%, primarily driven by lower revenues in North America.
- Treasury and trade solutions revenues increased 8%. Excluding the impact of FX translation, revenues increased 9%, reflecting strength in all regions, driven by growth across both net interest and fee income. Revenues increased in the cash business, primarily driven by continued growth in deposit balances and improved deposit spreads due to higher interest rates, as well as higher transaction volumes from both new and existing clients. The trade business experienced strong revenue growth, as the business continued to focus on high-quality loan growth, while spreads remained largely stable throughout the year. Average deposits increased 6%, with growth across regions. Average trade loans increased 4%, driven by growth in EMEA and Asia.
- Corporate lending revenues increased 26%. Excluding the impact of gains (losses) on loan hedges, revenues increased 15%, driven by higher loan volumes and lower hedging costs. Average loans increased 9% versus the prior year.
- Private bank revenues increased 9%, driven by underlying growth across all regions, reflecting improved deposit spreads due to higher interest rates and higher managed investment revenues.

Within Markets and securities services:

- Fixed income markets revenues decreased 6%, driven by lower revenues in North America and Asia. The decrease in revenues was due to lower net interest revenue (decrease of 16%), as non-interest revenues were largely unchanged. The decline in net interest revenues was driven by rates and currencies as well as spread products and other fixed

income revenues, mainly reflecting a change in the mix of trading positions in support of client activity, as well as higher funding costs, given the higher interest rate environment.

Rates and currencies revenues decreased 5%, primarily driven by lower G10 rates revenues in North America, Asia and EMEA, reflecting lower client activity given the uncertain macroenvironment and challenging trading environment, and comparison to a strong prior year, particularly in EMEA. This decrease in revenues was partially offset by higher G10 FX revenues, particularly in EMEA, reflecting the continued benefit from the return of volatility in FX markets as well as strong corporate and investor client activity. Spread products and other fixed income revenues decreased 8%, driven by North America, primarily due to the challenging trading environment characterized by widening spreads and lower investor client activity.

Equity markets revenues increased 19%. Excluding an episodic loss in derivatives of approximately $130 million related to a single client event in the prior year, revenues increased 14%, as growth in equity derivatives and prime finance was partially offset by lower cash equities revenues. Excluding the episodic loss in the prior year, equity derivatives revenues increased in all regions, driven by strong investor and corporate client activity as well as a more favorable market environment. Principal transaction revenues increased, partially offset by a decrease in net interest revenue, mainly reflecting a change in the mix of trading positions in support of client activity. Prime finance revenues increased, particularly in EMEA and Asia, reflecting growth in client balances and higher investor client activity. Cash equities revenues decreased modestly, primarily driven by Asia, due to a more challenging trading environment.

- Securities services revenues increased 11%. Excluding the impact of FX translation, revenues increased 13%, reflecting continued strength in EMEA and Asia. The increase in revenues was driven by higher fee revenues, reflecting growth in client volumes, as well as higher net interest revenue driven by higher deposit volumes and higher interest rates.

Expenses increased 3%, as higher compensation, volume-related expenses and continued investments were partially offset by efficiency savings.

Provisions increased $199 million, driven by a net loan loss reserve build of $12 million (compared to a net release of $380 million in the prior year), partially offset by a 53% decline in net credit losses. The modest net loan loss reserve build was driven by volume-related reserve builds for both funded loans and unfunded lending commitments, despite credit quality remaining stable during 2018. The decline in net credit losses was largely driven by the absence of a single client event in the fourth quarter of 2017.

2017 vs. 2016

Net income decreased 5%, reflecting the one-time impact of Tax Reform in 2017. Excluding the one-time impact of Tax Reform in 2017, net income increased 16%, primarily driven by higher revenues and lower cost of credit, partially offset by higher expenses.

- Revenues increased 7%, reflecting a 16% increase in Banking (including the losses on loan hedges). Excluding the impact of the losses on loan hedges, Banking revenues increased 12%. Markets and securities services revenues were largely unchanged, as growth in securities services revenues (increase of 8%) as well as the gain on the sale of the fixed income analytics business in 2017 were offset by a 5% decrease in fixed income markets and a 2% decrease in equity markets revenues.

Within Banking:

- Investment banking revenues increased 21%, largely reflecting gains in wallet share and increased market activity. Advisory revenues increased 11%, equity underwriting revenues increased 69% and debt underwriting revenues increased 13%.
- Treasury and trade solutions revenues increased 8%. Excluding the impact of FX translation, revenues increased 7%, primarily due to continued growth in transaction volumes and deposit balances and improved spreads. Trade revenues increased modestly, driven by steady loan growth, partially offset by an industry-wide tightening of loan spreads.
- Corporate lending revenues increased 58%. Excluding the impact of losses on loans hedges, revenues increased 12%, driven by lower hedging costs and the absence of a prior-year adjustment to the residual value of a lease financing transaction.
- Private bank revenues increased 14%, primarily due to higher loan and deposit volumes, higher deposit spreads and increased managed investments and capital markets activity.

Within Markets and securities services:

- Fixed income markets revenues decreased 5%, primarily due to low volatility as well as the comparison to higher revenues in the prior year from a more robust trading environment. The decline in revenues was driven by lower net interest revenue, largely due to higher funding costs and a change in the mix of trading positions in support of client activity. The decline was partially offset by higher principal transactions revenues and commissions and fees revenues.
- Rates and currencies revenues decreased 5%, driven by lower G10 rates and currencies revenues. Spread products and other fixed income revenues decreased 6%, due to a difficult trading environment in 2017 given low volatility, driving lower credit markets and commodities revenues, partially offset by higher municipals revenues, as well as higher securitized markets revenues.

- Equity markets revenues decreased 2%. Excluding the episodic loss in derivatives of approximately $130 million related to a single client event in 2017, revenues increased 3%, as continued growth in prime finance and delta one client balances and higher investor client activity were partially offset by lower episodic activity with corporate clients. Excluding the episodic loss in derivatives, equity derivatives revenues increased, driven by the stronger investor client activity. Cash equities revenues were modestly higher as well, partially offset by lower cash commissions, as clients continued to move toward automated execution platforms across the industry.
- Securities services revenues increased 8%. Excluding the impact of the divestiture of a private equity fund services business in 2016, revenues increased 12%, driven by growth in client volumes and higher interest revenue due to a more favorable rate environment.

Expenses increased 4%, as higher compensation, volume-related expenses and investments were partially offset by efficiency savings.

Provisions improved $501 million, driven by a net loan loss release of $380 million (compared to a net release of $30 million in 2016) and a 29% decline in net credit losses. The increase in net loan loss reserve releases was driven by an improvement in the provision for unfunded lending commitments in the corporate loan portfolio, as well as a favorable credit environment, stability in commodity prices and continued improvement in the portfolio. The decline in net credit losses was largely driven by improvement in the energy sector, partially offset by the impact of the single client event noted above.

CORPORATE/OTHER

Corporate/Other includes certain unallocated costs of global staff functions (including finance, risk, human resources, legal and compliance), other corporate expenses and unallocated global operations and technology expenses and income taxes, as well as Corporate Treasury, certain North America legacy consumer loan portfolios, other legacy assets and discontinued operations (for additional information on Corporate/Other, see “Citigroup Segments” above). At December 31, 2018, Corporate/Other had $91 billion in assets, an increase of 17% from the prior year.

In millions of dollars	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net interest revenue	$2,254	$2,000	$3,045	13 %	(34)%
Non-interest revenue	(171)	1,132	2,188	NM	(48)
Total revenues, net of interest expense	$2,083	$3,132	$5,233	(33)%	(40)%
Total operating expenses	$2,272	$3,814	$5,042	(40)%	(24)%
Net credit losses	$21	$149	$435	(86)%	(66)%
Credit reserve build (release)	(218)	(317)	(456)	31	30
Provision (release) for unfunded lending commitments	(3)	—	(8)	—	100
Provision for benefits and claims	(2)	(7)	98	71	NM
Provisions for credit losses and for benefits and claims	$(202)	$(175)	$69	(15)	NM
Income (loss) from continuing operations before taxes	$13	$(507)	$122	NM	NM
Income taxes (benefits)	(113)	19,064	(455)	NM	NM
Income (loss) from continuing operations	$126	$(19,571)	$577	NM	NM
Income (loss) from discontinued operations, net of taxes	(8)	(111)	(58)	93	(91)
Net income (loss) before attribution of noncontrolling interests	$118	$(19,682)	$519	NM	NM
Noncontrolling interests	11	(6)	(2)	NM	NM
Net income (loss)	$107	$(19,676)	$521	NM	NM

NM Not meaningful

2018 vs. 2017

Net income was $107 million in 2018, compared to a net loss of $19.7 billion in the prior year, primarily driven by the $19.8 billion one-time, non-cash charge recorded in the tax line in 2017 due to the impact of Tax Reform. Results in 2018 included the one-time benefit of $94 million in the tax line, related to Tax Reform. For additional information, see “Significant Accounting Policies and Significant Estimates—Income Taxes” below.

Excluding the one-time impact of Tax Reform in 2018 and 2017, net income decreased 92%, reflecting lower revenues, partially offset by lower expenses, lower cost of credit and tax benefits related to the reorganization of certain non-U.S. subsidiaries. The tax benefits were largely offset by the release of a foreign currency translation adjustment (CTA) from AOCI to earnings (for additional information on the CTA release, see Note 19 to the Consolidated Financial Statements).

Revenues decreased 33%, driven by the continued wind-down of legacy assets.

Expenses decreased 40%, primarily driven by the wind-down of legacy assets, lower infrastructure costs and lower legal expenses.

Provisions decreased $27 million to a net benefit of $202 million, primarily due to lower net credit losses, partially offset by a lower net loan loss reserve release. Net credit losses declined 86% to $21 million, primarily reflecting the impact of ongoing divestiture activity and the continued wind-

down of the North America mortgage portfolio. The net reserve release declined by $96 million to $221 million, and reflected the continued wind-down of the legacy North America mortgage portfolio and divestitures.

2017 vs. 2016

The net loss was $19.7 billion, compared to net income of $521 million in the prior year, primarily driven by the one-time impact of Tax Reform. Excluding the one-time impact of Tax Reform, net income declined 69% to $168 million, reflecting lower revenues, partially offset by lower expenses and lower cost of credit.

Revenues declined 40%, primarily reflecting the continued wind-down of legacy assets and the absence of gains related to debt buybacks in 2016. Revenues included approximately $750 million in gains on asset sales in the first quarter of 2017, which more than offset a roughly $300 million charge related to the exit of Citi's U.S. mortgage servicing operations in the quarter.

Expenses declined 24%, reflecting the wind-down of legacy assets and lower legal expenses, partially offset by approximately $100 million in episodic expenses primarily related to the exit of the U.S. mortgage servicing operations. Also included in expenses is an approximately $255 million provision for remediation costs related to a CARD Act matter in 2017.

Provisions decreased $244 million to a net benefit of $175 million, primarily due to lower net credit losses and a lower provision for benefits and claims, partially offset by a lower net loan loss reserve release. Net credit losses declined 66%, primarily reflecting the impact of ongoing divestiture activity and the continued wind-down of the North America mortgage portfolio. The decline in the provision for benefits and claims was primarily due to lower insurance activity. The net reserve release declined $147 million, and reflected the continued wind-down of the legacy North America mortgage portfolio and divestitures.

OFF-BALANCE SHEET ARRANGEMENTS

Citigroup enters into various types of off-balance sheet arrangements in the ordinary course of business. Citi's involvement in these arrangements can take many different forms, including without limitation:

- purchasing or retaining residual and other interests in unconsolidated special purpose entities, such as mortgage-backed and other asset-backed securitization entities;
- holding senior and subordinated debt, interests in limited and general partnerships and equity interests in other unconsolidated special purpose entities;
- providing guarantees, indemnifications, loan commitments, letters of credit and representations and warranties; and
- entering into operating leases for property and equipment.

Citi enters into these arrangements for a variety of business purposes. For example, securitization arrangements offer investors access to specific cash flows and risks created through the securitization process. Securitization arrangements also assist Citi and its customers in monetizing their financial assets and securing financing at more favorable rates than Citi or the customers could otherwise obtain.

The table below shows where a discussion of Citi's various off-balance sheet arrangements may be found in this Form 10-K. In addition, see Note 1 to the Consolidated Financial Statements.

Types of Off-Balance Sheet Arrangements	Disclosures in this Form 10-K
Variable interests and other obligations, including contingent obligations, arising from variable interests in nonconsolidated VIEs	See Note 21 to the Consolidated Financial Statements.
Letters of credit, and lending and other commitments	See Note 26 to the Consolidated Financial Statements.
Guarantees	See Note 26 to the Consolidated Financial Statements.
Leases	See Note 26 to the Consolidated Financial Statements.

CONTRACTUAL OBLIGATIONS

The following table includes information on Citigroup's contractual obligations, as specified and aggregated pursuant to SEC requirements:

	Contractual obligations by year						
In millions of dollars	2019	2020	2021	2022	2023	Thereafter	Total
Long-term debt obligations—principal[1]	$38,590	$37,303	$28,542	$14,095	$19,061	$94,408	$231,999
Long-term debt obligations—interest payments[2]	8,232	6,763	5,489	4,664	4,022	37,617	66,787
Operating and capital lease obligations	925	748	657	525	394	1,890	5,139
Purchase obligations[3]	535	494	509	501	329	1,024	3,392
Other liabilities[4]	33,077	523	132	79	75	1,718	35,604
Total	$81,359	$45,831	$35,329	$19,864	$23,881	$136,657	$342,921

(1) For additional information about long-term debt obligations, see "Liquidity Risk—Long-Term Debt" below and Note 17 to the Consolidated Financial Statements.

(2) Contractual obligations related to interest payments on long-term debt for 2019–2023 are calculated by applying the December 31, 2018 weighted-average interest rate (3.87%) on average outstanding long-term debt to the average remaining contractual obligations on long-term debt for each of those years. The "Thereafter" interest payments on long-term debt for the remaining years to maturity (2024–2098) are calculated by applying current interest rates on the remaining contractual obligations on long-term debt for each of those years.

(3) Purchase obligations consist of obligations to purchase goods or services that are enforceable and legally binding on Citi. For presentation purposes, purchase obligations are included in the table above through the termination date of the respective agreements, even if the contract is renewable. Many of the purchase agreements for goods or services include clauses that would allow Citi to cancel the agreement with specified notice; however, that impact is not included in the table above (unless Citi has already notified the counterparty of its intention to terminate the agreement).

(4) Other liabilities reflected on Citigroup's Consolidated Balance Sheet includes accounts payable, accrued expenses, uncertain tax positions and other liabilities that have been incurred and will ultimately be paid in cash; legal reserve accruals are not included in the table above. Also includes discretionary contributions in 2018 for Citi's employee-defined benefit obligations for the pension, postretirement and post employment plans and defined contribution plans.

CAPITAL RESOURCES

Overview

Capital is used principally to support assets in Citi's businesses and to absorb credit, market and operational losses. Citi primarily generates capital through earnings from its operating businesses. Citi may augment its capital through issuances of common stock, noncumulative perpetual preferred stock and equity issued through awards under employee benefit plans, among other issuances. Further, Citi's capital levels may also be affected by changes in accounting and regulatory standards, as well as U.S. corporate tax laws and the impact of future events on Citi's business results, such as changes in interest and foreign exchange rates, as well as business and asset dispositions. During 2018, Citi returned a total of $18.4 billion of capital to common shareholders in the form of share repurchases (approximately 212 million common shares) and dividends.

Capital Management

Citi's capital management framework is designed to ensure that Citigroup and its principal subsidiaries maintain sufficient capital consistent with each entity's respective risk profile, management targets and all applicable regulatory standards and guidelines. Citi assesses its capital adequacy against a series of internal quantitative capital goals, designed to evaluate its capital levels in expected and stressed economic environments. Underlying these internal quantitative capital goals are strategic capital considerations, centered on preserving and building financial strength. The Citigroup Capital Committee, with oversight from the Risk Management Committee of Citigroup's Board of Directors, has responsibility for Citi's aggregate capital structure, including the capital assessment and planning process, which is integrated into Citi's capital plan. Balance sheet management, including oversight of capital adequacy, for Citigroup's subsidiaries is governed by each entity's Asset and Liability Committee, where applicable. Based on Citigroup's current regulatory capital requirements, as well as consideration of potential future changes to the U.S. Basel III rules, management currently believes that a targeted Common Equity Tier 1 Capital ratio of approximately 11.5% represents the amount necessary to prudently operate and invest in Citi's franchise, including when considering future growth plans, capital return projections and other factors that may impact Citi's businesses. However, management may revise Citigroup's targeted Common Equity Tier 1 Capital ratio in response to changing regulatory capital requirements as well as other relevant factors.

For additional information regarding Citi's capital planning and stress testing exercises, see "Stress Testing Component of Capital Planning" below.

Current Regulatory Capital Standards

Citi is subject to regulatory capital standards issued by the Federal Reserve Board, which constitute the U.S. Basel III rules. These rules establish an integrated capital adequacy framework, encompassing both risk-based capital ratios and leverage ratios.

Risk-Based Capital Ratios

The U.S. Basel III rules set forth the composition of regulatory capital (including the application of regulatory capital adjustments and deductions), as well as two comprehensive methodologies (a Standardized Approach and Advanced Approaches) for measuring total risk-weighted assets. Total risk-weighted assets under the Advanced Approaches, which are primarily models based, include credit, market, and operational risk-weighted assets. The Standardized Approach generally applies prescribed supervisory risk weights to broad categories of credit risk exposures. As a result, credit risk-weighted assets calculated under the Advanced Approaches are more risk sensitive than those calculated under the Standardized Approach. Market risk-weighted assets are currently calculated on a generally consistent basis under both approaches. The Standardized Approach excludes operational risk-weighted assets.

The U.S. Basel III rules establish stated minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios for substantially all U.S. banking organizations, including Citi and Citibank, N.A. (Citibank). Moreover, these rules provide for both a fixed 2.5% Capital Conservation Buffer and, for Advanced Approaches banking organizations, such as Citi and Citibank, a discretionary Countercyclical Capital Buffer. These capital buffers would

be available to absorb losses in advance of any potential impairment of regulatory capital below the stated minimum risk-based capital ratio requirements. Any breach of the buffers to absorb losses during periods of financial or economic stress would result in restrictions on earnings distributions (e.g., dividends, equity repurchases, and discretionary executive bonuses), with the degree of such restrictions based upon the extent to which the buffers are breached. The Federal Reserve Board last voted to affirm the Countercyclical Capital Buffer amount at the current level of 0% in December 2017.

Further, the U.S. Basel III rules implement the "capital floor provision" of the so-called "Collins Amendment" of the Dodd-Frank Act, which requires Advanced Approaches

banking organizations to calculate each of the three risk-based capital ratios (Common Equity Tier 1 Capital, Tier 1 Capital, and Total Capital) under both the U.S. Basel III Standardized Approach and the Advanced Approaches and comply with the lower of each of the resulting risk-based capital ratios.

GSIB Surcharge

The Federal Reserve Board imposes a risk-based capital surcharge upon U.S. bank holding companies that are identified as global systemically important bank holding companies (GSIBs), including Citi. The GSIB surcharge augments the Capital Conservation Buffer and, if invoked, any Countercyclical Capital Buffer.

Under the Federal Reserve Board's rule, identification of a GSIB is based on the Basel Committee on Banking Supervision's (Basel Committee) GSIB methodology, which primarily looks to five equally weighted broad categories of systemic importance: (i) size, (ii) interconnectedness, (iii) cross-jurisdictional activity, (iv) substitutability and (v) complexity. With the exception of size, each of the other categories is composed of multiple indicators, also of equal weight, and amounting to 12 indicators in total.

A U.S. bank holding company that is designated a GSIB is required, on an annual basis, to calculate a surcharge using two methods and is subject to the higher of the resulting two surcharges. The first method ("method 1") is based on the Basel Committee's GSIB methodology described above. Under the second method ("method 2"), the substitutability category is replaced with a quantitative measure intended to assess a GSIB's reliance on short-term wholesale funding. In addition, method 1 incorporates relative measures of systemic importance across certain global banking organizations and a year-end spot foreign exchange rate, whereas method 2 uses fixed measures of systemic importance and application of an average foreign exchange rate over a three-year period. The GSIB surcharges calculated under both method 1 and method 2 are based on measures of systemic importance from the year immediately preceding that in which the GSIB surcharge calculations are being performed (e.g., the method 1 and method 2 GSIB surcharges to be calculated by December 31, 2019 will be based on 2018 systemic indicator data). Generally, Citi's surcharge determined under method 2 will result in a higher surcharge than its surcharge determined under method 1.

Should a GSIB's systemic importance change year-over-year such that it becomes subject to a higher surcharge, the higher surcharge would not become effective for a full year (e.g., a higher surcharge calculated by December 31, 2019 would not become effective until January 1, 2021). However, if a GSIB's systemic importance changes such that the GSIB would be subject to a lower surcharge, the GSIB would be subject to the lower surcharge beginning with the next calendar year (e.g., a lower surcharge calculated by December 31, 2019 would become effective January 1, 2020).

The following table sets forth Citi's GSIB surcharge as determined under method 1 and method 2 for 2018 and 2017:

	2018	2017
Method 1	2.0%	2.0%
Method 2	3.0	3.0

Citi's GSIB surcharge effective for both 2018 and 2017 was 3.0%, as derived under the higher method 2 result. Citi's GSIB surcharge effective for 2019 will remain unchanged at 3.0%, as derived under the higher method 2 result. Citi expects that its method 2 GSIB surcharge will continue to remain higher than its method 1 GSIB surcharge and, as such, Citi's GSIB surcharge effective for 2020 will not exceed 3.0%, and Citi's GSIB surcharge effective for 2021 is not expected to exceed 3.0%.

Transition Provisions

Generally, the U.S. Basel III rules contain several differing, largely multi-year transition provisions, with various "phase-ins" and "phase-outs." Moreover, the GSIB surcharge, Capital Conservation Buffer, and any Countercyclical Capital Buffer (currently 0%) commenced phase-in on January 1, 2016, becoming fully effective on January 1, 2019. However, with the exception of the non-grandfathered trust preferred securities, which do not fully phase-out of Tier 2 Capital until January 1, 2022, and the capital buffers and GSIB surcharge, which do not fully phase-in until January 1, 2019, all other transition provisions have occurred and were entirely reflected in Citi's regulatory capital ratios beginning January 1, 2018. Accordingly, commencing with 2018, Citi is presenting a single set of regulatory capital components and ratios, reflecting current regulatory capital standards in effect throughout 2018. Citi previously disclosed its Basel III risk-based capital and leverage ratios and related components reflecting Basel III transition

arrangements with respect to regulatory capital adjustments and deductions, as well as full implementation, in Citi's 2017 Annual Report on Form 10-K; however, beginning January 1, 2018, that distinction is no longer relevant.
The following chart sets forth the transitional progression from January 1, 2017 to full implementation by January 1, 2019 of the regulatory capital components comprising the effective minimum risk-based capital ratios.

Basel III Transition Arrangements: Minimum Risk-Based Capital Ratios

For additional information regarding the transition arrangements under the U.S. Basel III rules, including Citigroup's and Citibank's capital resources reflecting Basel III transition arrangements as of December 31, 2017, see "Capital Resources—Current Regulatory Capital Standards" in Citigroup's 2017 Annual Report on Form 10-K.

Tier 1 Leverage Ratio

Under the U.S. Basel III rules, Citi is also required to maintain a minimum Tier 1 Leverage ratio of 4.0%. The Tier 1 Leverage ratio, a non-risk-based measure of capital adequacy, is defined as Tier 1 Capital as a percentage of quarterly adjusted average total assets less amounts deducted from Tier 1 Capital.

Supplementary Leverage Ratio

Citi is also required to calculate a Supplementary Leverage ratio, which differs from the Tier 1 Leverage ratio by also including certain off-balance sheet exposures within the denominator of the ratio (Total Leverage Exposure). The Supplementary Leverage ratio represents end of period Tier 1 Capital to Total Leverage Exposure, with the latter defined as the sum of the daily average of on-balance sheet assets for the quarter and the average of certain off-balance sheet exposures calculated as of the last day of each month in the quarter, less applicable Tier 1 Capital deductions. Effective January 1,
2018, Advanced Approaches banking organizations are required to maintain a stated minimum Supplementary Leverage ratio of 3.0%.

Further, U.S. GSIBs, including Citi, are subject to enhanced Supplementary Leverage ratio standards. The enhanced Supplementary Leverage ratio standards establish a 2.0% leverage buffer in addition to the stated 3.0% minimum Supplementary Leverage ratio requirement, for a total effective minimum Supplementary Leverage ratio requirement of 5.0%. Effective January 1, 2018, if a U.S. GSIB fails to exceed the 2.0% buffer, it will be subject to increasingly onerous restrictions (depending upon the extent of the shortfall) regarding capital distributions and discretionary executive bonus payments.

Prompt Corrective Action Framework

In general, the Prompt Corrective Action (PCA) regulations direct the U.S. banking agencies to enforce increasingly strict limitations on the activities of insured depository institutions that fail to meet certain regulatory capital thresholds. The PCA framework contains five categories of capital adequacy as measured by risk-based capital and leverage ratios: (i) “well capitalized,” (ii) “adequately capitalized,” (iii) undercapitalized,” (iv) “significantly undercapitalized,” and (v) “critically undercapitalized.”

Accordingly, an insured depository institution, such as Citibank, must maintain minimum Common Equity Tier 1 Capital, Tier 1 Capital, Total Capital, and Tier 1 Leverage ratios of 6.5%, 8.0%, 10.0% and 5.0%, respectively, to be considered “well capitalized.” Additionally, insured depository institution subsidiaries of U.S. GSIBs, including Citibank, must maintain a minimum Supplementary Leverage ratio of 6.0%, effective January 1, 2018, to be considered “well capitalized.”

Stress Testing Component of Capital Planning

Citi is subject to an annual assessment by the Federal Reserve Board as to whether Citigroup has effective capital planning processes as well as sufficient regulatory capital to absorb losses during stressful economic and financial conditions, while also meeting obligations to creditors and counterparties and continuing to serve as a credit intermediary. This annual assessment includes two related programs:

- The Comprehensive Capital Analysis and Review (CCAR) evaluates Citi’s capital adequacy, capital adequacy process, and its planned capital distributions, such as dividend payments and common stock repurchases. As part of CCAR, the Federal Reserve Board assesses whether Citi has sufficient capital to continue operations throughout times of economic and financial market stress and whether Citi has robust, forward-looking capital planning processes that account for its unique risks. The Federal Reserve Board may object to Citi’s annual capital plan based on either quantitative or qualitative grounds. If the Federal Reserve Board objects to Citi’s annual capital plan, Citi may not undertake any capital distribution unless the Federal Reserve Board indicates in writing that it does not object to the distribution.
- Dodd-Frank Act Stress Testing (DFAST) is a forward-looking quantitative evaluation of the impact of stressful economic and financial market conditions on Citi’s regulatory capital. This program serves to inform the Federal Reserve Board and the general public as to how Citi’s regulatory capital ratios might change using a hypothetical set of adverse economic conditions as designed by the Federal Reserve Board. In addition to the annual supervisory stress test conducted by the Federal Reserve Board, Citi is required to conduct annual company-run stress tests under the same adverse economic conditions designed by the Federal Reserve Board, as well as conduct a mid-cycle stress test under company-developed scenarios.

Both CCAR and DFAST include an estimate of projected revenues, losses, reserves, pro forma regulatory capital ratios, and any other additional capital measures deemed relevant by Citi. Projections are required over a nine-quarter planning horizon under three supervisory scenarios (baseline, adverse and severely adverse conditions). All risk-based capital ratios reflect application of the Standardized Approach framework under the U.S. Basel III rules. Moreover, the Federal Reserve Board has deferred the use of the Advanced Approaches framework indefinitely.

For additional information regarding CCAR, see “Risk Factors—Strategic Risks” below. For additional information on potential changes to the stress testing component of capital planning and assessment process applicable to Citi, see “Regulatory Capital Standards Developments” below.

In addition, Citibank is required to conduct the annual Dodd-Frank Act Stress Test. The annual stress test consists of a forward-looking quantitative evaluation of the impact of stressful economic and financial market conditions under several scenarios on Citibank’s regulatory capital. This program serves to inform the Office of the Comptroller of the Currency as to how Citibank’s regulatory capital ratios might change during a hypothetical set of adverse economic conditions and to ultimately evaluate the reliability of Citibank’s capital planning process.

Citigroup’s Capital Resources

Citi is required to maintain stated minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios of 4.5%, 6.0% and 8.0%, respectively.

Citi's effective minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios during 2018, inclusive of the 75% phase-in of both the 2.5% Capital Conservation Buffer and the 3.0% GSIB surcharge (all of which is to be composed of Common Equity Tier 1 Capital), are 8.625%, 10.125% and 12.125%, respectively. Citi's effective minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios during 2017, inclusive of the 50% phase-in of both the 2.5% Capital Conservation Buffer and the 3.0% GSIB surcharge (all of which is to be composed of Common Equity Tier 1 Capital), were 7.25%, 8.75% and 10.75%, respectively.

Citi's effective minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratio requirements during 2019, inclusive of the 2.5% Capital Conservation Buffer and the Countercyclical Capital Buffer at its current level of 0%, as well as a 3.0% GSIB surcharge, will be 10.0%, 11.5% and 13.5%, respectively.

Furthermore, to be "well capitalized" under current federal bank regulatory agency definitions, a bank holding company must have a Tier 1 Capital ratio of at least 6.0%, a Total Capital ratio of at least 10.0%, and not be subject to a Federal Reserve Board directive to maintain higher capital levels.

Under the U.S. Basel III rules, Citi must comply with a 4.0% minimum Tier 1 Leverage ratio requirement. Effective January 1, 2018, Citi must also comply with an effective 5.0% minimum Supplementary Leverage ratio requirement.

The following tables set forth the capital tiers, total risk-weighted assets and underlying risk components, risk-based capital ratios, quarterly adjusted average total assets, Total Leverage Exposure and leverage ratios for Citi as of December 31, 2018 and 2017.

Citigroup Capital Components and Ratios

In millions of dollars, except ratios	December 31, 2018		December 31, 2017	
	Advanced Approaches	Standardized Approach	Advanced Approaches	Standardized Approach
Common Equity Tier 1 Capital	$139,252	$139,252	$142,822	$142,822
Tier 1 Capital	158,122	158,122	162,377	162,377
Total Capital (Tier 1 Capital + Tier 2 Capital)	183,144	195,440	187,877	199,989
Total Risk-Weighted Assets	1,131,933	1,174,448	1,152,644	1,155,099
Credit Risk	$758,887	$1,109,007	$767,102	$1,089,372
Market Risk	63,987	65,441	65,003	65,727
Operational Risk	309,059	—	320,539	—
Common Equity Tier 1 Capital ratio[1][2]	12.30 %	11.86 %	12.39 %	12.36 %
Tier 1 Capital ratio[1][2]	13.97	13.46	14.09	14.06
Total Capital ratio[1][2]	16.18	16.64	16.30	17.31

In millions of dollars, except ratios	December 31, 2018	December 31, 2017
Quarterly Adjusted Average Total Assets[3]	$1,896,959	$1,868,326
Total Leverage Exposure[4]	2,465,641	2,432,491
Tier 1 Leverage ratio[2]	8.34 %	8.69 %
Supplementary Leverage ratio[2]	6.41	6.68

(1) As of December 31, 2018 and 2017, Citi's reportable Common Equity Tier 1 Capital and Tier 1 Capital ratios were the lower derived under the Basel III Standardized Approach, whereas the reportable Total Capital ratio was the lower derived under the Basel III Advanced Approaches framework.

(2) Citi's risk-based capital and leverage ratios and related components as of December 31, 2017 are non-GAAP financial measures, which reflect full implementation of regulatory capital adjustments and deductions prior to the effective date of January 1, 2018. Citi believes these ratios and the related components provide useful information to investors and others by measuring Citi's progress in prior periods against currently effective regulatory capital standards.

(3) Tier 1 Leverage ratio denominator.

(4) Supplementary Leverage ratio denominator.

Common Equity Tier 1 Capital Ratio

Citi's Common Equity Tier 1 Capital ratio was 11.9% at December 31, 2018, compared to 11.7% at September 30, 2018 and 12.4% at December 31, 2017. The quarter-over-quarter increase was primarily due to net income of $4.3 billion as well as decreases in risk-weighted assets, partially offset by the return of $5.8 billion of capital to common shareholders. Citi's Common Equity Tier 1 Capital ratio declined from year-end 2017 primarily due to a reduction in Common Equity Tier 1 Capital resulting from the return of $18.4 billion capital to common shareholders, an increase in risk-weighted assets, and adverse net movements in AOCI, partially offset by net income of $18.0 billion in 2018.

Components of Citigroup Capital In millions of dollars	December 31, 2018	December 31, 2017
Common Equity Tier 1 Capital		
Citigroup common stockholders' equity[1]	$ 177,928	$ 181,671
Add: Qualifying noncontrolling interests	147	153
Regulatory Capital Adjustments and Deductions:		
Less: Accumulated net unrealized losses on cash flow hedges, net of tax[2]	(728)	(698)
Less: Cumulative unrealized net gain (loss) related to changes in fair value of financial liabilities attributable to own creditworthiness, net of tax[3]	580	(721)
Less: Intangible assets:		
Goodwill, net of related DTLs[4]	21,778	22,052
Identifiable intangible assets other than MSRs, net of related DTLs	4,402	4,401
Less: Defined benefit pension plan net assets	806	896
Less: DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards[5]	11,985	13,072
Total Common Equity Tier 1 Capital (Standardized Approach and Advanced Approaches)	$ 139,252	$ 142,822
Additional Tier 1 Capital		
Qualifying noncumulative perpetual preferred stock[1]	$ 18,292	$ 19,069
Qualifying trust preferred securities[6]	1,384	1,377
Qualifying noncontrolling interests	55	61
Regulatory Capital Deductions:		
Less: Permitted ownership interests in covered funds[7]	806	900
Less: Minimum regulatory capital requirements of insurance underwriting subsidiaries[8]	55	52
Total Additional Tier 1 Capital (Standardized Approach and Advanced Approaches)	$ 18,870	$ 19,555
Total Tier 1 Capital (Common Equity Tier 1 Capital + Additional Tier 1 Capital) (Standardized Approach and Advanced Approaches)	$ 158,122	$ 162,377
Tier 2 Capital		
Qualifying subordinated debt	$ 23,324	$ 23,673
Qualifying trust preferred securities[9]	321	329
Qualifying noncontrolling interests	47	50
Eligible allowance for credit losses[10]	13,681	13,612
Regulatory Capital Deduction:		
Less: Minimum regulatory capital requirements of insurance underwriting subsidiaries[8]	55	52
Total Tier 2 Capital (Standardized Approach)	$ 37,318	$ 37,612
Total Capital (Tier 1 Capital + Tier 2 Capital) (Standardized Approach)	$ 195,440	$ 199,989
Adjustment for excess of eligible credit reserves over expected credit losses[10]	$ (12,296)	$ (12,112)
Total Tier 2 Capital (Advanced Approaches)	$ 25,022	$ 25,500
Total Capital (Tier 1 Capital + Tier 2 Capital) (Advanced Approaches)	$ 183,144	$ 187,877

(1) Issuance costs of $168 million and $184 million related to noncumulative perpetual preferred stock outstanding at December 31, 2018 and 2017, respectively, are excluded from common stockholders' equity and netted against such preferred stock in accordance with Federal Reserve Board regulatory reporting requirements, which differ from those under U.S. GAAP.

(2) Common Equity Tier 1 Capital is adjusted for accumulated net unrealized gains (losses) on cash flow hedges included in AOCI that relate to the hedging of items not recognized at fair value on the balance sheet.

(3) The cumulative impact of changes in Citigroup's own creditworthiness in valuing liabilities for which the fair value option has been elected, and own-credit valuation adjustments on derivatives, are excluded from Common Equity Tier 1 Capital, in accordance with the U.S. Basel III rules.

(4) Includes goodwill “embedded” in the valuation of significant common stock investments in unconsolidated financial institutions.

Footnotes continue on the following page.

(5) Of Citi's $22.9 billion of net DTAs at December 31, 2018, $11.9 billion was includable in Common Equity Tier 1 Capital pursuant to the U.S. Basel III rules, while $11.0 billion was excluded. Excluded from Citi's Common Equity Tier 1 Capital as of December 31, 2018 was $12.0 billion of net DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards, which was reduced by $1.0 billion of net DTLs primarily associated with goodwill and certain other intangible assets. Separately, under the U.S. Basel III rules, goodwill and these other intangible assets are deducted net of associated DTLs in arriving at Common Equity Tier 1 Capital. DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards are required to be entirely deducted from Common Equity Tier 1 Capital under the U.S. Basel III rules. Commencing on December 31, 2017, Citi's DTAs arising from temporary differences were less than the 10% limitation under the U.S. Basel III rules and therefore not subject to deduction from Common Equity Tier 1 Capital, but are subject to risk-weighting at 250%.

(6) Represents Citigroup Capital XIII trust preferred securities, which are permanently grandfathered as Tier 1 Capital under the U.S. Basel III rules.

(7) Banking entities are required to be in compliance with the Volcker Rule of the Dodd-Frank Act which prohibits conducting certain proprietary investment activities and limits their ownership of, and relationships with, covered funds. Accordingly, Citi is required by the Volcker Rule to deduct from Tier 1 Capital all permitted ownership interests in covered funds.

(8) 50% of the minimum regulatory capital requirements of insurance underwriting subsidiaries must be deducted from each of Tier 1 Capital and Tier 2 Capital.

(9) Represents the amount of non-grandfathered trust preferred securities eligible for inclusion in Tier 2 Capital under the U.S. Basel III rules, which will be fully phased-out of Tier 2 Capital by January 1, 2022.

(10) Under the Standardized Approach, the allowance for credit losses is eligible for inclusion in Tier 2 Capital up to 1.25% of credit risk-weighted assets, with any excess allowance for credit losses being deducted in arriving at credit risk-weighted assets, which differs from the Advanced Approaches framework, in which eligible credit reserves that exceed expected credit losses are eligible for inclusion in Tier 2 Capital to the extent the excess reserves do not exceed 0.6% of credit risk-weighted assets. The total amount of eligible credit reserves in excess of expected credit losses that were eligible for inclusion in Tier 2 Capital, subject to limitation, under the Advanced Approaches framework was $1.4 billion and $1.5 billion at December 31, 2018 and 2017, respectively.

Citigroup Capital Rollforward

In millions of dollars	Three Months Ended December 31, 2018	Twelve Months Ended December 31, 2018
Common Equity Tier 1 Capital, beginning of period	$140,428	$142,822
Net income	4,313	18,045
Common and preferred stock dividends declared	(1,402)	(5,039)
Net increase in treasury stock	(4,692)	(14,061)
Net change in common stock and additional paid-in capital	81	(102)
Net increase in foreign currency translation adjustment net of hedges, net of tax	(394)	(2,362)
Net change in unrealized gains (losses) on debt securities AFS, net of tax	1,072	(1,092)
Net increase in defined benefit plans liability adjustment, net of tax	(489)	(74)
Net change in adjustment related to changes in fair value of financial liabilities attributable to own creditworthiness, net of tax	(129)	(188)
Net decrease in ASC 815—Excluded component of Fair Value Hedges	(35)	(57)
Net decrease in goodwill, net of related DTLs	113	274
Net increase in identifiable intangible assets other than MSRs, net of related DTLs	(98)	(1)
Net decrease in defined benefit pension plan net assets	125	90
Net decrease in DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards	360	1,087
Other	(1)	(90)
Net decrease in Common Equity Tier 1 Capital	$(1,176)	$(3,570)
Common Equity Tier 1 Capital, end of period (Standardized Approach and Advanced Approaches)	$139,252	$139,252
Additional Tier 1 Capital, beginning of period	$19,449	$19,555
Net decrease in qualifying perpetual preferred stock	(559)	(777)
Net increase in qualifying trust preferred securities	2	7
Net change in permitted ownership interests in covered funds	(11)	94
Other	(11)	(9)
Net decrease in Additional Tier 1 Capital	$(579)	$(685)
Additional Tier 1 Capital, end of period (Standardized Approach and Advanced Approaches)	$18,870	$18,870
Tier 1 Capital, end of period (Standardized Approach and Advanced Approaches)	$158,122	$158,122
Tier 2 Capital, beginning of period (Standardized Approach)	$36,931	$37,612
Net change in qualifying subordinated debt	376	(349)
Net increase in eligible allowance for credit losses	25	69
Other	(14)	(14)
Net change in Tier 2 Capital (Standardized Approach)	$387	$(294)
Tier 2 Capital, end of period (Standardized Approach)	$37,318	$37,318
Total Capital, end of period (Standardized Approach)	$195,440	$195,440
Tier 2 Capital, beginning of period (Advanced Approaches)	$24,746	$25,500
Net change in qualifying subordinated debt	376	(349)
Net decrease in excess of eligible credit reserves over expected credit losses	(86)	(115)
Other	(14)	(14)
Net change in Tier 2 Capital (Advanced Approaches)	$276	$(478)
Tier 2 Capital, end of period (Advanced Approaches)	$25,022	$25,022
Total Capital, end of period (Advanced Approaches)	$183,144	$183,144

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Citigroup Risk-Weighted Assets Rollforward (Basel III Standardized Approach)

In millions of dollars	Three Months Ended December 31, 2018	Twelve Months Ended December 31, 2018
Total Risk-Weighted Assets, beginning of period	$1,196,923	$1,155,099
Changes in Credit Risk-Weighted Assets		
Net increase in general credit risk exposures[1]	135	2,850
Net increase in repo-style transactions[2]	1,449	7,070
Net increase in securitization exposures[3]	2,300	2,068
Net change in equity exposures	(1,484)	1,195
Net change in over-the-counter (OTC) derivatives[4]	(10,849)	7,364
Net change in other exposures[5]	(535)	1,464
Net decrease in off-balance sheet exposures[6]	(8,878)	(2,376)
Net change in Credit Risk-Weighted Assets	$(17,862)	$19,635
Changes in Market Risk-Weighted Assets		
Net change in risk levels[7]	$(4,219)	$7,383
Net decrease due to model and methodology updates[8]	(394)	(7,669)
Net decrease in Market Risk-Weighted Assets	$(4,613)	$(286)
Total Risk-Weighted Assets, end of period	$1,174,448	$1,174,448

(1) General credit risk exposures include cash and balances due from depository institutions, securities, and loans and leases. General credit risk exposures increased during the 12 months ended December 31, 2018 mainly driven by growth in corporate loans.

(2) Repo-style transactions include repurchase and reverse repurchase transactions as well as securities borrowing and securities lending transactions.

(3) Securitization exposures increased during the three and 12 months ended December 31, 2018 due to increased exposures from new deals.

(4) OTC derivatives decreased during the three months ended December 31, 2018 due to a decrease in notional amounts for bilateral trades. OTC derivatives increased during the 12 months ended December 31, 2018, primarily due to notional increases.

(5) Other exposures include cleared transactions, unsettled transactions, and other assets. Other exposures increased during the 12 months ended December 31, 2018 primarily due to increases in various other assets subject to risk-weighting at 100% and additional DTAs arising from temporary differences, which are subject to risk-weighting at 250%.

(6) Off-balance sheet exposures decreased during the three and 12 months ended December 31, 2018, primarily due to a reduction in loan commitments.

(7) Risk levels decreased during the three months ended December 31, 2018 primarily due to a decrease in positions subject to incremental risk charges. Risk levels increased during the 12 months ended December 31, 2018 primarily due to changes in exposure levels subject to Value at Risk and Stressed Value at Risk.

(8) Risk-weighted assets decreased during the 12 months ended December 31, 2018 primarily due to changes in model inputs regarding volatility and the correlation between market risk factors, as well as methodology changes for standard specific risk charges.

Citigroup Risk-Weighted Assets Rollforward (Basel III Advanced Approaches)

In millions of dollars	Three Months Ended December 31, 2018	Twelve Months Ended December 31, 2018
Total Risk-Weighted Assets, beginning of period	$1,155,188	$1,152,644
Changes in Credit Risk-Weighted Assets		
Net change in retail exposures[1]	2,320	(11,898)
Net decrease in wholesale exposures[2]	(6,392)	(635)
Net increase in repo-style transactions[3]	3,334	4,728
Net increase in securitization exposures[4]	2,118	2,505
Net change in equity exposures	(1,412)	1,466
Net decrease in over-the-counter (OTC) derivatives[5]	(8,817)	(7,063)
Net change in derivatives CVA	(465)	1,318
Net change in other exposures[6]	(1,141)	1,904
Net decrease in supervisory 6% multiplier[7]	(600)	(540)
Net decrease in Credit Risk-Weighted Assets	$(11,055)	$(8,215)
Changes in Market Risk-Weighted Assets		
Net change in risk levels[8]	$(4,266)	$6,653
Net decrease due to model and methodology updates[9]	(394)	(7,669)
Net decrease in Market Risk-Weighted Assets	$(4,660)	$(1,016)
Net decrease in Operational Risk-Weighted Assets[10]	$(7,540)	$(11,480)
Total Risk-Weighted Assets, end of period	$1,131,933	$1,131,933

(1) Retail exposures increased during the three months ended December 31, 2018, primarily due to seasonal spending for qualifying revolving (cards) exposures. Retail exposures decreased during the 12 months ended December 31, 2018, primarily due to residential mortgage loan sales and repayments.

(2) Wholesale exposures decreased during the three months ended December 31, 2018, primarily due to decreases in loan commitments.

(3) Repo-style transactions include repurchase and reverse repurchase transactions as well as securities borrowing and securities lending transactions.

(4) Securitization exposures increased during the three and 12 months ended December 31, 2018, due to increased exposures from new deals.

(5) OTC derivatives decreased during the three and 12 months ended December 31, 2018, primarily due to decreases in potential future exposure and fair value.

(6) Other exposures include cleared transactions, unsettled transactions, assets other than those reportable in specific exposure categories and non-material portfolios.

(7) Supervisory 6% multiplier does not apply to derivatives CVA.

(8) Risk levels decreased during the three months ended December 31, 2018, primarily due to a decrease in positions subject to incremental risk charges. Risk levels increased during the 12 months ended December 31, 2018 primarily due to changes in exposure levels subject to Value at Risk and Stressed Value at Risk.

(9) Risk-weighted assets decreased during the 12 months ended December 31, 2018 primarily due to changes in model inputs regarding volatility and the correlation between market risk factors, as well as methodology changes for standard specific risk charges.

(10) Operational risk-weighted assets decreased during the three months and 12 months ended December 31, 2018 primarily due to changes in operational loss severity and frequency.

Total risk-weighted assets under the Basel III Standardized Approach increased from year-end 2017 due to higher credit risk-weighted assets, slightly offset by a decrease in market risk-weighted assets. The increase in credit risk-weighted assets was primarily due to changes in OTC derivative trade activity, repo-style transactions, growth in corporate loans, securitization exposures and other exposures, partially offset by a decrease in loan commitments. Total risk-weighted assets under the Basel III Advanced Approaches decreased from year-end 2017 driven by lower operational and credit, as well as market risk-weighted assets. The decrease in operational risk-weighted assets was primarily due to changes in operational loss severity and frequency. The decrease in credit risk-weighted assets was primarily due to a decline in retail exposures driven by a reduction in residential mortgage loan sales and repayments, and changes in OTC derivative trade activity, partially offset by increases in repo-style transactions, securitization exposures and other exposures.

Market risk-weighted assets decreased under both the Basel III Standardized Approach and Basel III Advanced Approaches primarily due to changes in model inputs regarding volatility and the correlation between market risk factors, as well as methodology changes for standard specific risk charges, partially offset by increases in positions subject to Value at Risk and Stressed Value at Risk.

Supplementary Leverage Ratio

Citigroup's Supplementary Leverage ratio was 6.4% for the fourth quarter of 2018, compared to 6.5% for the third quarter of 2018 and 6.7% for the fourth quarter of 2017. The decline in the ratio quarter-over-quarter was principally driven by a reduction in Tier 1 Capital resulting from the return of $5.8 billion of capital to common shareholders, partially offset by net income of $4.3 billion. The decline in the ratio from the fourth quarter of 2017 was largely attributable to a reduction in Tier 1 Capital resulting from the return of $18.4 billion of capital to common shareholders, adverse net movements in AOCI, as well as an increase in Total Leverage Exposure primarily due to growth in average on-balance sheet assets, partially offset by net income of $18.0 billion.

The following table sets forth Citi's Supplementary Leverage ratio and related components as of December 31, 2018 and 2017.

Citigroup Basel III Supplementary Leverage Ratio and Related Components

In millions of dollars, except ratios	December 31, 2018	December 31, 2017
Tier 1 Capital	$158,122	$162,377
Total Leverage Exposure (TLE)		
On-balance sheet assets[1]	$1,936,791	$1,909,699
Certain off-balance sheet exposures:[2]		
Potential future exposure on derivative contracts	187,130	191,555
Effective notional of sold credit derivatives, net[3]	49,402	59,207
Counterparty credit risk for repo-style transactions[4]	23,715	27,005
Unconditionally cancelable commitments	69,630	67,644
Other off-balance sheet exposures	238,805	218,754
Total of certain off-balance sheet exposures	$568,682	$564,165
Less: Tier 1 Capital deductions	39,832	41,373
Total Leverage Exposure	$2,465,641	$2,432,491
Supplementary Leverage ratio	6.41 %	6.68 %

(1) Represents the daily average of on-balance sheet assets for the quarter.

(2) Represents the average of certain off-balance sheet exposures calculated as of the last day of each month in the quarter.

(3) Under the U.S. Basel III rules, banking organizations are required to include in TLE the effective notional amount of sold credit derivatives, with netting of exposures permitted if certain conditions are met.

(4) Repo-style transactions include repurchase or reverse repurchase transactions and securities borrowing or securities lending transactions.

Capital Resources of Citigroup's Subsidiary U.S.
Depository Institutions

Citigroup's subsidiary U.S. depository institutions are also subject to regulatory capital standards issued by their respective primary federal bank regulatory agencies, which are similar to the standards of the Federal Reserve Board. During 2018, Citi's primary subsidiary U.S. depository institution, Citibank, N.A. (Citibank), is subject to effective minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios, inclusive of the 75% phase-in of the 2.5% Capital Conservation Buffer, of 6.375%, 7.875% and 9.875%, respectively. Citibank's effective minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios during

2017, inclusive of the 50% phase-in of the 2.5% Capital Conservation Buffer, were 5.75%, 7.25% and 9.25%, respectively. Citibank is required to maintain stated minimum Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios of 4.5%, 6.0% and 8.0%, respectively.

The following tables set forth the capital tiers, total risk-weighted assets and underlying risk components, risk-based capital ratios, quarterly adjusted average total assets, Total Leverage Exposure and leverage ratios for Citibank, Citi's primary subsidiary U.S. depository institution, as of December 31, 2018 and 2017.

Citibank Capital Components and Ratios

In millions of dollars, except ratios	December 31, 2018		December 31, 2017	
	Advanced Approaches	Standardized Approach	Advanced Approaches	Standardized Approach
Common Equity Tier 1 Capital	$129,217	$129,217	$122,848	$122,848
Tier 1 Capital	131,341	131,341	124,952	124,952
Total Capital (Tier 1 Capital + Tier 2 Capital)[1]	144,485	155,280	138,008	148,946
Total Risk-Weighted Assets	927,931	1,030,514	965,435	1,024,502
Credit Risk	$656,664	$991,999	$674,659	$980,324
Market Risk	38,144	38,515	43,300	44,178
Operational Risk	233,123	—	247,476	—
Common Equity Tier 1 Capital ratio[2][3][4]	13.93 %	12.54 %	12.72 %	11.99 %
Tier 1 Capital ratio[2][3][4]	14.15	12.75	12.94	12.20
Total Capital ratio[2][3][4]	15.57	15.07	14.29	14.54

In millions of dollars, except ratios	December 31, 2018	December 31, 2017
Quarterly Adjusted Average Total Assets[5]	$1,399,029	$1,401,187
Total Leverage Exposure[6]	1,914,817	1,900,641
Tier 1 Leverage ratio[2][4]	9.39 %	8.92 %
Supplementary Leverage ratio[2][4]	6.86	6.57

(1) Under the Advanced Approaches framework eligible credit reserves that exceed expected credit losses are eligible for inclusion in Tier 2 Capital to the extent the excess reserves do not exceed 0.6% of credit risk-weighted assets, which differs from the Standardized Approach in which the allowance for credit losses is eligible for inclusion in Tier 2 Capital up to 1.25% of credit risk-weighted assets, with any excess allowance for credit losses being deducted in arriving at credit risk-weighted assets.

(2) Citibank's risk-based capital and leverage ratios and related components as of December 31, 2017 are non-GAAP financial measures, which reflect full implementation of regulatory capital adjustments and deductions prior to the effective date of January 1, 2018. Citi believes these ratios and the related components provide useful information to investors and others by measuring Citi's progress in prior periods against currently effective regulatory capital standards.

(3) As of December 31, 2018, Citibank's reportable Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios were the lower derived under the Basel III Standardized Approach. As of December 31, 2017, Citibank's

reportable Common Equity Tier 1 Capital and Tier 1 Capital ratios were the lower derived under the Basel III Standardized Approach, whereas the reportable Total Capital ratio was the lower derived under the Basel III Advanced Approaches framework.

(4) Citibank must maintain minimum Common Equity Tier 1 Capital, Tier 1 Capital, Total Capital and Tier 1 Leverage ratios of 6.5%, 8.0%, 10.0% and 5.0%, respectively, to be considered “well capitalized” under the revised Prompt Corrective Action (PCA) regulations applicable to insured depository institutions as established by the U.S. Basel III rules. Effective January 1, 2018, Citibank must also maintain a minimum Supplementary Leverage ratio of 6.0% to be considered “well capitalized.”

(5) Tier 1 Leverage ratio denominator.

(6) Supplementary Leverage ratio denominator.

Impact of Changes on Citigroup and Citibank Capital Ratios

The following tables present the estimated sensitivity of Citigroup's and Citibank's capital ratios to changes of $100 million in Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital (numerator), and changes of $1 billion in Advanced Approaches and Standardized Approach risk-weighted assets and quarterly adjusted average total assets, as well as Total Leverage Exposure (denominator), as of December 31, 2018. The information below is provided for the purpose of analyzing the impact that a change in Citigroup's

or Citibank's financial position or results of operations could have on these ratios. These sensitivities only consider a single change to either a component of regulatory capital, risk-weighted assets, quarterly adjusted average total assets or Total Leverage Exposure. Accordingly, an event that affects more than one factor may have a larger basis point impact than is reflected in these tables.

Impact of Changes on Citigroup and Citibank Risk-Based Capital Ratios

	Common Equity Tier 1 Capital ratio		Tier 1 Capital ratio		Total Capital ratio	
In basis points	Impact of $100 million change in Common Equity Tier 1 Capital	Impact of $1 billion change in risk-weighted assets	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in risk-weighted assets	Impact of $100 million change in Total Capital	Impact of $1 billion change in risk-weighted assets
Citigroup						
Advanced Approaches	0.9	1.1	0.9	1.2	0.9	1.4
Standardized Approach	0.9	1.0	0.9	1.1	0.9	1.4
Citibank						
Advanced Approaches	1.1	1.5	1.1	1.5	1.1	1.7
Standardized Approach	1.0	1.2	1.0	1.2	1.0	1.5

Impact of Changes on Citigroup and Citibank Leverage Ratios

	Tier 1 Leverage ratio		Supplementary Leverage ratio	
In basis points	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in quarterly adjusted average total assets	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in Total Leverage Exposure
Citigroup	0.5	0.4	0.4	0.3
Citibank	0.7	0.7	0.5	0.4

Citigroup Broker-Dealer Subsidiaries

At December 31, 2018, Citigroup Global Markets Inc., a U.S. broker-dealer registered with the SEC that is an indirect wholly owned subsidiary of Citigroup, had net capital, computed in accordance with the SEC's net capital rule, of $8.2 billion, which exceeded the minimum requirement by $5.6 billion.

Moreover, Citigroup Global Markets Limited, a broker-dealer registered with the United Kingdom's Prudential Regulation Authority (PRA) that is also an indirect wholly owned subsidiary of Citigroup, had total capital of $20.9 billion at December 31, 2018, which exceeded the PRA's minimum regulatory capital requirements.

In addition, certain of Citi's other broker-dealer subsidiaries are subject to regulation in the countries in which they do business, including requirements to maintain specified levels of net capital or its equivalent. Citigroup's other broker-dealer subsidiaries were in compliance with their capital requirements at December 31, 2018.

Regulatory Capital Standards Developments

The U.S. banking agencies and the Basel Committee issued numerous proposed and final rules on a variety of topics in 2018, as well as early 2019. In the U.S., the most significant proposals would introduce stress buffer requirements, as well as a new methodology for calculating risk-weighted assets for derivative contracts. The Basel Committee, among other things, finalized revisions to the GSIB framework as well as the minimum capital requirements for market risk.

U.S. Banking Agencies

Regulatory Capital Treatment—Implementation and Transition of the Current Expected Credit Losses (CECL) Methodology

In February 2019, the U.S. banking agencies issued a final rule that provides banking organizations an optional phase-in over a three-year period of the "Day One" adverse regulatory capital effects resulting from adoption of the CECL methodology.

The rule is in recognition of the issuance by the Financial Accounting Standards Board of ASU No. 2016-13, "Financial Instruments—Credit Losses," which will replace the current incurred loss methodology for recognizing credit losses with the CECL methodology. The ASU will be effective for Citi as of January 1, 2020, and will generally result in the earlier recognition of the provision for credit losses and related allowance for credit losses than current practice. For additional information regarding the CECL methodology, see "Future Application of Accounting Standards" below.

Citi and Citibank plan to elect the transition provisions provided by the rule, and will phase-in the "Day One" regulatory capital effects resulting from adoption of the CECL methodology over the three-year period beginning January 1, 2020.

Separately, in December 2018, the Federal Reserve Board issued a statement that it plans to maintain its current framework for calculating allowances on loans in the supervisory stress test for the 2020 and 2021 supervisory stress test cycles, and to evaluate appropriate future enhancements to this framework as best practices for implementing CECL are developed. However, banking organizations are required to incorporate CECL into their stress testing methodologies, data, and disclosure beginning in the cycle coinciding with their first full year of CECL adoption (2020 for Citi).

Stress Buffer Requirements

In April 2018, the Federal Reserve Board issued a proposal that is designed to more closely integrate the results of the quantitative assessment in CCAR with firms' ongoing minimum capital requirements under the U.S. Basel III rules. Specifically, the proposed rule would replace the existing Capital Conservation Buffer, currently fixed at 2.5% under the U.S. Basel III rules, with (i) a variable buffer known as the Stress Capital Buffer (as described below), plus (ii) for U.S. GSIBs, the GSIB's then-current GSIB surcharge, plus (iii) the Countercyclical Capital Buffer, if any. These three components would constitute the new Capital Conservation Buffer.

The Stress Capital Buffer (SCB) would be equal to the maximum decline in a bank holding company's Common Equity Tier 1 Capital ratio under the severely adverse scenario of the supervisory stress test, plus planned common stock dividends for each of the fourth through seventh quarters of the planning horizon (expressed as a percentage of risk-weighted assets)—the so-called "dividend add-on." The SCB would be subject to a floor of 2.5%.

In addition to the SCB, the proposed rule would establish a new Stress Leverage Buffer requirement above the stated minimum Tier 1 Leverage ratio requirement. The Stress Leverage Buffer would be equal to the maximum decline in a bank holding company's Tier 1 Leverage ratio under the severely adverse scenario of the supervisory stress test, plus planned common stock dividends for each of the fourth through seventh quarters of the planning horizon (expressed as a percentage of quarterly adjusted average total assets).

Finally, the proposed rule would also modify certain assumptions currently required in supervisory stress tests, including continued capital distributions during the nine-quarter capital planning horizon and balance sheet growth assumptions.

Under the timeline for stress testing and CCAR cycles included within the proposed rule, the Federal Reserve Board would generally release its calculation of each bank holding company's SCB and Stress Leverage Buffer by June 30 of each year.

A final rule has not yet been issued. In late 2018, senior staff at the Federal Reserve Board indicated publicly that the proposal would not take effect until 2020 at the earliest. It was also noted that the Federal Reserve Board plans to re-propose certain elements of the proposal to better balance the need to preserve the dynamism of stress testing while reducing unnecessary volatility. The potential re-proposal may also address certain other elements of the original proposal, such as the relative timing between stress testing results and the submission of a firm's capital plan, the consequences of breaching a buffer, the role and calibration of the dividend add-on, and the necessity of the Stress Leverage Buffer.

Enhanced Supplementary Leverage Ratio and Total Loss-Absorbing Capacity (TLAC) Requirements

In April 2018, the Federal Reserve Board and the Office of the Comptroller of the Currency (OCC) jointly issued a proposal that would modify the enhanced Supplementary Leverage ratio standards applicable to U.S. GSIBs and their Federal Reserve Board or OCC-regulated insured depository institution subsidiaries.

The proposed rule would replace the currently fixed 2.0% leverage buffer requirement with a variable leverage buffer requirement equal to 50% of the U.S. GSIB's currently applicable GSIB surcharge. Similarly, for the regulated insured depository institution subsidiaries of U.S. GSIBs, such as Citibank, the proposed rule would replace the currently fixed 6.0% threshold at which these subsidiaries are considered to be "well capitalized" under the PCA framework with a threshold set at the stated minimum requirement of

3.0% plus 50% of the GSIB surcharge applicable to the U.S. GSIB of which it is a subsidiary.
The proposed rule would also make corresponding modifications to certain of the Federal Reserve Board's TLAC requirements applicable to U.S. GSIBs. Accordingly, under the proposed rule, each U.S. GSIB's fixed 2.0% leverage-based TLAC buffer would be replaced with a buffer equal to 50% of the GSIB surcharge, and the leverage component of each U.S. GSIB's Long-Term Debt (LTD) requirement would be revised to equal Total Leverage Exposure multiplied by 2.5% plus 50% of the U.S. GSIB's applicable GSIB surcharge. For additional information about TLAC, see "Managing Global Risk—Liquidity Risk—Long-Term Debt—Total Loss-Absorbing Capacity (TLAC)" below.
If adopted as proposed, and assuming that Citi maintains a method 2 GSIB surcharge of 3.0%, Citi's effective minimum Supplementary Leverage ratio requirement would be reduced to 4.5%, compared to the current 5.0%. Citibank's effective minimum Supplementary Leverage ratio to be determined "well capitalized" under the PCA framework would similarly be reduced to 4.5%, compared to the current 6.0%. Citi's leverage-based TLAC buffer would decrease from 2.0% to 1.5%, which would reduce Citi's effective minimum leverage-based TLAC requirement from 9.5% to 9.0%. Additionally, the leverage component of Citi's long-term debt requirement would decrease from 4.5% to 4.0%.
The Economic Growth, Regulatory Relief, and Consumer Protection Act, which was signed into law in 2018, directs the U.S. banking agencies to amend the U.S. Basel III rules to exclude certain custody-related deposits from the definition of Total Leverage Exposure for custody banks. The U.S. banking agencies have not yet issued a notice of proposed rulemaking in response to this particular provision of the Act, and it is currently unclear how this may impact or interact with their proposed rulemaking from April 2018.

Standardized Approach for Counterparty Credit Risk
In December 2018, the U.S. banking agencies issued a proposal to introduce the Standardized Approach for Counterparty Credit Risk (SA-CCR) in the U.S. SA-CCR would replace the Current Exposure Method (CEM), which is the current methodology used to calculate risk-weighted assets for all derivative contracts under the Standardized Approach, as well as risk-weighted assets for derivative contracts under the Advanced Approaches in cases where internal models are not used. Additionally, SA-CCR would replace CEM in numerous other instances throughout the regulatory framework, including but not limited to the Supplementary Leverage Ratio, single counterparty credit limits, and legal lending limits.
Under SA-CCR, a banking organization would calculate the exposure amount of its derivative contracts at the netting set level. Multiple derivative contracts would generally be considered to be under the same netting set so long as each derivative contract is subject to the same qualifying master netting agreement. SA-CCR also introduces the concept of hedging sets, which would allow a banking organization to fully or partially net derivative contracts within the same netting set that share similar risk factors. Moreover, SA-CCR

incorporates updated supervisory factors and maturity factors to calculate the potential future exposure of a derivative contract, and provides for improved recognition of collateral. Under the proposal, the exposure amount of a netting set would be equal to an alpha factor of 1.4 multiplied by the sum of the replacement cost and potential future exposure of the netting set.
The effective date of the proposed rule is July 1, 2020; however, early adoption would be permitted. If adopted as proposed, Citi's risk-weighted assets related to derivative contracts under the Standardized Approach are likely to increase. The ultimate impact on Citi, however, will depend upon the specific provisions of any final rule.

Stress Testing Requirements
The U.S. banking agencies have recently issued a number of proposals that would modify company-run stress testing requirements to conform with the Economic Growth, Regulatory Relief, and Consumer Protection Act. In October 2018, the Federal Reserve Board released a proposal that would eliminate the mid-cycle stress test requirement for all bank holding companies, including Citi, effective in the 2020 cycle (the proposal would maintain the requirement to conduct an annual company-run stress test). In January 2019, the Federal Reserve Board released a further proposal that would eliminate the hypothetical adverse scenario from company-run stress tests for bank holding companies,

including Citi. Similarly, the Federal Reserve Board would no longer include an adverse scenario in its supervisory stress tests. (The Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation released similar proposals in December 2018.) Company-run stress tests and supervisory stress tests would continue to include a severely adverse scenario. The proposals did not specify a proposed effective date for the elimination of the adverse scenario.

Basel Committee

Revised Assessment Framework for Global Systemically Important Banks

In July 2018, the Basel Committee issued a final standard which revised its framework for assessing the global systemic importance of banks, beginning with the 2021 assessment. (For a description of the Basel Committee's GSIB methodology, so-called "method 1" under the U.S. Basel III rules, see "Current Regulatory Capital Standards—GSIB Surcharge" above.)

The final standard introduces a trading volume indicator within the substitutability/financial institution infrastructure category, accompanied by an equivalent reduction in the current weighting of the existing underwriting indicator. Among other revisions, the standard also expands the scope of consolidation to include exposures of insurance subsidiaries within the size, interconnectedness, and complexity categories.

If the Federal Reserve Board were to adopt the Basel Committee's revisions with respect to the U.S. GSIB framework, Citi's estimated method 1 GSIB surcharge would remain unchanged at 2.0%.

The Basel Committee indicated in the standard that it plans to complete another review of the GSIB framework by 2021, at which time it will consider alternative methodologies for the substitutability category, including the removal of the existing cap. Citi's estimated method 1 GSIB surcharge may increase in the future, if the Federal Reserve Board were to adopt alternative methodologies for the substitutability category.

Revisions to the Minimum Capital Requirements for
Market Risk

In January 2019, the Basel Committee issued a final standard that revises the market risk capital framework—the so-called Fundamental Review of the Trading Book, or FRTB. The final rule revises the assessment process under the Advanced Approaches to determine whether a bank's internal risk management models appropriately reflect the risks of individual trading desks, and clarifies the requirements for identification of risk factors that are eligible for internal modeling. In addition, the risk weights for general interest rate risk and foreign exchange risk under the Standardized Approach have been recalibrated.

If the U.S. banking agencies were to adopt the Basel Committee's revised market risk framework unchanged, Citi believes its market risk-weighted assets could increase significantly. The ultimate impact on Citi, however, will depend upon the specific provisions of any final rule.

Leverage Ratio Treatment of Client Cleared Derivatives

In October 2018, the Basel Committee issued a consultative document seeking views as to whether a targeted and limited revision of the leverage ratio exposure measure was warranted with regard to the treatment of client cleared derivatives. In the U.S., the Basel Committee's leverage ratio framework and leverage ratio exposure measure are most closely aligned with the Supplementary Leverage Ratio and Total Leverage Exposure, respectively. Under the Basel Committee's leverage ratio framework, the leverage ratio exposure measure is generally not adjusted for physical or financial collateral, guarantees or other credit risk mitigation techniques, including initial margin received from clients. However, the Basel Committee consultative document proposes two alternative treatments for client cleared derivatives that would reduce the leverage ratio exposure measure, to varying degrees, in recognition of the beneficial effects of margin requirements and overcollateralization, as applicable.

One of the options under consideration would allow amounts of cash and non-cash initial margin that are received from the client to offset the potential future exposure of derivatives centrally cleared on the client's behalf. Another option would amend the currently specified treatment of client cleared derivatives to align it with the measurement as determined per the Basel Committee's standardized approach for measuring counterparty credit risk exposures, as used for risk-based capital requirements. This option would permit both cash and non-cash forms of initial margin and variation margin received from the client to offset replacement cost and potential future exposure for client cleared derivatives only.

If the U.S. agencies were to amend the Supplementary Leverage Ratio requirements in a manner similar to either of the options under consideration by the Basel Committee, Citi's Supplementary Leverage Ratio would likely benefit modestly. However, the impact from and timing of any actions undertaken by the Basel Committee or the U.S. banking agencies in this regard remains uncertain.

Tangible Common Equity, Book Value Per Share, Tangible Book Value Per Share and Returns on Equity
Tangible common equity (TCE), as defined by Citi, represents common stockholders' equity less goodwill and identifiable intangible assets (other than MSRs). Other companies may calculate TCE in a different manner. TCE, tangible book value (TBV) per share and return on average TCE are non-GAAP financial measures. Citi believes the presentation of TCE, TBV per share and return on average TCE provides alternate measures of capital strength and performance that are commonly used by investors and industry analysts.

In millions of dollars or shares, except per share amounts	December 31, 2018	December 31, 2017
Total Citigroup stockholders' equity	$ 196,220	$ 200,740
Less: Preferred stock	18,460	19,253
Common stockholders' equity	$ 177,760	$ 181,487
Less:		
Goodwill	22,046	22,256
Identifiable intangible assets (other than MSRs)	4,636	4,588
Goodwill and identifiable intangible assets (other than MSRs) related to assets held-for-sale (HFS)	—	32
Tangible common equity (TCE)	$ 151,078	$ 154,611
Common shares outstanding (CSO)	2,368.5	2,569.9
Book value per share (common equity/CSO)	$ 75.05	$ 70.62
Tangible book value per share (TCE/CSO)	63.79	60.16

In millions of dollars	Year ended December 31, 2018	Year ended December 31, 2017[1]
Net income less preferred dividends	$ 16,872	$ 14,583
Average common stockholders' equity	$ 179,497	$ 207,747
Average TCE	$ 153,343	$ 180,458
Return on average common stockholders' equity	9.4 %	7.0 %
Return on average TCE (ROTCE)[2]	11.0	8.1

(1) Year ended December 31, 2017 excludes the one-time impact of Tax Reform. For a reconciliation of these measures, see "Significant Accounting Policies and Significant Estimates—Income Taxes" below.
(2) ROTCE represents net income available to common shareholders as a percentage of average TCE.

RISK FACTORS

The following discussion sets forth what management currently believes could be the most significant risks and uncertainties that could impact Citi's businesses, results of operations and financial condition. Other risks and uncertainties, including those not currently known to Citi or its management, could also negatively impact Citi's businesses, results of operations and financial condition. Thus, the following should not be considered a complete discussion of all of the risks and uncertainties Citi may face.

STRATEGIC RISKS

Citi's Ability to Return Capital to Common Shareholders Consistent with Its Capital Planning Efforts and Targets Substantially Depends on the CCAR Process and the Results of Regulatory Stress Tests.

Citi's ability to return capital to its common shareholders consistent with its capital planning efforts and targets, whether through its common stock dividend or through a share repurchase program, substantially depends, among other things, on regulatory approval, including through the CCAR process required by the Federal Reserve Board (FRB) and the supervisory stress tests required under the Dodd-Frank Act. The ability to return capital also depends on Citi's results of operations and effectiveness in managing its level of risk-weighted assets and GSIB surcharge. Citi's ability to accurately predict, interpret or explain to stakeholders the outcome of the CCAR process, and thus to address any market or investor perceptions, may be limited as the FRB's assessment of Citi's capital adequacy is conducted using the FRB's proprietary stress test models, as well as a number of qualitative factors, including a detailed assessment of Citi's "capital adequacy process," as defined by the FRB. For additional information on Citi's return of capital to common shareholders in 2018 as well as the CCAR process, supervisory stress test requirements and GSIB surcharge, see "Capital Resources—Overview" and "Capital Resources—Current Regulatory Capital Standards—Stress Testin Component of Capital Planning" above.

The FRB has stated that it expects leading capital adequacy practices will continue to evolve and will likely be determined by the FRB each year as a result of its cross-firm review of capital plan submissions. Similarly, the FRB has indicated that, as part of its stated goal to continually evolve its annual stress testing requirements, several parameters of the annual stress testing process may continue to be altered, including the severity of the stress test scenario, the FRB modeling of Citi's balance sheet and the addition of components deemed important by the FRB. Additionally, in April 2018, the FRB proposed integration of the annual stress testing requirements with ongoing regulatory capital requirements. Proposed changes to the stress testing regime include, among others, introduction of a firm-specific "stress capital buffer" (SCB), which would be equal to the maximum decline in a firm's Common Equity Tier 1 Capital ratio under a severely adverse scenario over a nine-quarter CCAR measurement period, subject to a

minimum requirement of 2.5%. The FRB proposed that the SCB would replace the capital conservation buffer in the firm's ongoing regulatory capital requirements for Standardized Approach capital ratios. The SCB would be calculated by the FRB using its proprietary data and modeling of each firm's results. Accordingly, a firm's SCB would change annually based on the supervisory stress test results, thus potentially resulting in year-to-year volatility in the calculation of the SCB. For additional information on the FRB's proposal, including calculation of the SCB, see "Capital Resources—Regulatory Capital Standards Developments" above.

Although various uncertainties exist regarding the extent of, and the ultimate impact to Citi from, these changes to the FRB's stress testing and CCAR regimes, these changes would likely increase the level of capital Citi is required or elects to hold, including as part of Citi's estimated management buffer, thus potentially impacting the extent to which Citi is able to return capital to shareholders.

Citi, Its Management and Its Businesses Must Continually Review, Analyze and Successfully Adapt to Ongoing Regulatory and Other Uncertainties and Changes in the U.S. and Globally.

Despite the adoption of final regulations in numerous areas impacting Citi and its businesses over the past several years, Citi, its management and its businesses continually face ongoing regulatory uncertainties and changes, both in the U.S. and globally. While the areas of ongoing regulatory uncertainties and changes facing Citi are too numerous to

list completely, various examples include, but are not limited to (i) uncertainties and potential fiscal, monetary and regulatory changes arising from the U.S. Presidential administration and Congress; (ii) potential changes to various aspects of the regulatory capital framework applicable to Citi (see the CCAR risk factor and "Capital Resources—Regulatory Capital Standards Developments" above); and (iii) the terms of and other uncertainties resulting from the U.K.'s potential exit from the European Union (EU) (see the macroeconomic challenges and uncertainties risk factor below).

Ongoing regulatory uncertainties and changes make Citi's and its management's long-term business, balance sheet and budget planning difficult or subject to change. For example, the U.S. Presidential administration has implemented and continues to discuss various changes to certain regulatory requirements, which would require ongoing assessment by management as to the impact to Citi, its businesses and business planning. Business planning is required to be based on possible or proposed rules or outcomes, which can change dramatically upon finalization, or upon implementation or interpretive guidance from numerous regulatory bodies worldwide, and such guidance can change.

Moreover, U.S. and international regulatory initiatives have not always been undertaken or implemented on a coordinated basis, and areas of divergence have developed and continue to develop with respect to the scope, interpretation, timing, structure or approach, leading to inconsistent or even conflicting regulations, including within a single jurisdiction. For example, in 2016, the European Commission proposed to

introduce a new requirement for major banking groups headquartered outside the EU (which would include Citi) to establish an intermediate EU holding company where the foreign bank has two or more institutions (broadly meaning banks, broker-dealers and similar financial firms) established in the EU. While the proposal mirrors an existing U.S. requirement for non-U.S. banking organizations to form U.S. intermediate holding companies, if adopted, it could lead to additional complexity with respect to Citi's resolution planning, capital and liquidity allocation and efficiency in various jurisdictions. Regulatory changes have also significantly increased Citi's compliance risks and costs (see the implementation and interpretation of regulatory changes risk factor below).

Citi's Ability to Utilize Its DTAs, and Thus Reduce the Negative Impact of the DTAs on Citi's Regulatory Capital, Will Be Driven by Its Ability to Generate U.S. Taxable Income and by the Provisions of and Guidance Issued in Connection with Tax Reform.

At December 31, 2018, Citi's net DTAs were $22.9 billion, net of a valuation allowance of $9.3 billion, of which $11.0 billion was excluded from Citi's Common Equity Tier 1 Capital under the U.S. Basel III rules (for additional information, see "Capital Resources—Components of Citigroup Capital" above). Of the net DTAs at December 31, 2018, $6.8 billion related to foreign tax credit carry-forwards (FTCs), net of a valuation allowance. The carry-forward utilization period for FTCs is 10 years and represents the most time-sensitive component of Citi's DTAs. The FTC carry-forwards at December 31, 2018 expire over the period of 2019-2028. Citi must utilize any FTCs generated in the then-current year tax return prior to utilizing any carry-forward FTCs.

The accounting treatment for realization of DTAs, including FTCs, is complex and requires significant judgment and estimates regarding future taxable earnings in the jurisdictions in which the DTAs arise and available tax planning strategies. Citi's ability to utilize its DTAs, including the FTC components, will be dependent upon Citi's ability to generate U.S. taxable income in the relevant tax carry-forward periods. Failure to realize any portion of the net DTAs would also have a corresponding negative impact on Citi's net income and financial returns.

The U.S. Department of the Treasury (U.S. Treasury) issued proposed regulations in November 2018 regarding the required allocation of existing FTC carry-forwards to the appropriate FTC baskets as redefined by Tax Reform and the allocation of the overall domestic loss (ODL) to these FTC baskets. An ODL allows a company to recharacterize domestic income as income from sources outside the U.S., which enables a taxpayer to use FTC carry-forwards and FTCs generated in future years, assuming the generation of sufficient U.S. taxed income. If the final regulations issued by the U.S. Treasury differ from the proposed regulations, the valuation allowance against Citi's FTC carry-forwards would increase or decrease, depending upon the content of the final regulations. Citi's net income would change by a corresponding amount. However, a change in recognized FTC

carry-forwards would not impact Citi's regulatory capital, given that such amounts are already fully disallowed.

Citi does not expect to be subject to the Base Erosion Anti-Abuse Tax (BEAT) added by Tax Reform. However, any final BEAT regulations could affect Citi's decisions as to how to structure its non-U.S. operations, possibly in a less cost-efficient manner. Further, if BEAT were to be applicable to Citi in any given year, it could have a significantly adverse effect on both Citi's net income and regulatory capital.

For additional information on the impact of Tax Reform and on Citi's DTAs, including the FTCs, see "Significant Accounting Policies and Significant Estimates—Income Taxes" below and Notes 1 and 9 to the Consolidated Financial Statements.

Citi's Interpretation or Application of the Complex Tax Laws to Which It Is Subject Could Differ from Those of the Relevant Governmental Authorities, Which Could Result in the Payment of Additional Taxes, Penalties or Interest.

Citi is subject to the various tax laws of the U.S. and its states and municipalities, as well as the numerous non-U.S. jurisdictions in which it operates. These tax laws are inherently complex and Citi must make judgments and interpretations about the application of these laws, including Tax Reform as mentioned above, to its entities, operations and businesses. Citi's interpretations and application of the tax laws, including with respect to Tax Reform, withholding tax obligations and stamp and other transactional taxes, could differ from that of the relevant governmental taxing authority, which could result in the payment of additional taxes, penalties or interest, which could be material.

Citi’s Continued Investments and Efficiency Initiatives May Not Be as Successful as It Projects or Expects.

Citi continues to leverage its scale and make incremental investments to deepen client relationships, increase revenue and lower expenses. For example, Citi continues to make investments to enhance its digital capabilities across the franchise, including digital platforms and mobile and cloud architecture. Citi also has been investing in higher return businesses, such as the U.S. cards and wealth management businesses in Global Consumer Banking (GCB) as well as equities and other businesses in Institutional Clients Group (ICG). Citi also continues to execute on its investment of more than $1 billion in Citibanamex through 2020. Further, Citi has been pursuing efficiency savings through various technology and digital initiatives, location strategy and organizational simplification, which are intended to self-fund Citi’s incremental investment initiatives as well as offset growth-related expenses.

Citi’s investments and efficiency initiatives are being undertaken as part of its overall strategy to meet operational and financial objectives and targets, including operating efficiency and revenue and earnings growth expectations. There is no guarantee that these or other initiatives Citi may pursue will be as productive or effective as Citi expects, or at all. Citi’s investment and efficiency initiatives may continue to evolve as its business strategies and the market environment change, which could make the initiatives more costly and

more challenging to implement, and limit their effectiveness. Moreover, Citi's ability to achieve expected returns on its investments and costs savings depends, in part, on factors that it cannot control, such as macroeconomic conditions, customer, client and competitor actions and ongoing regulatory changes, among others.

A Deterioration in or Failure to Maintain Citi's Co-Branding or Private Label Credit Card Relationships, Including as a Result of any Bankruptcy or Liquidation, Could Have a Negative Impact on Citi's Results of Operations or Financial Condition.

Citi has co-branding and private label relationships through its Citi-branded cards and Citi retail services credit card businesses with various retailers and merchants globally in the ordinary course of business whereby Citi issues credit cards to customers of the retailers or merchants. Citi's co-branding and private label agreements provide for shared economics between the parties and generally have a fixed term. The five largest relationships, including Sears, constituted an aggregate of approximately 11% of Citi's revenues in 2018.

These relationships could be negatively impacted by, among other things, external factors outside the control of either party to the relationship, such as the general economic environment, declining sales and revenues or other operational difficulties of the retailer or merchant, termination due to a contractual breach by Citi or by the retailer or merchant, or other factors, including bankruptcies, liquidations, restructurings, consolidations or other similar events. Over the last several years, a number of U.S. retailers have continued to experience declining sales, which has resulted in significant numbers of store closures and, in a number of cases, bankruptcies, as retailers attempt to cut costs and reorganize. For example, as previously disclosed, Sears filed for Chapter 11 bankruptcy protection in October 2018. On February 11, 2019, after bankruptcy court approval, ESL Investments purchased substantially all of Sears' assets on a going concern basis, including its credit card program agreement with Citi (for further information, including certain potential impacts to Citi retail services, see "Global Consumer Banking—North America GCB" above). In addition, as has been widely reported, competition among card issuers, including Citi, for these relationships is significant, and it has become increasingly difficult in recent years to maintain such relationships on the same terms or at all. While various mitigating factors could be available to Citi if any of these events were to occur-such as by replacing the retailer or merchant or offering other card products—such events, particularly bankruptcies or liquidations, could negatively impact the results of operations or financial condition of Citi-branded cards, Citi retail services or Citi as a whole, including as a result of loss of revenues, increased expenses, higher cost of credit, impairment of purchased credit card relationships and contract-related intangibles or other losses (for information on Citi's credit card related intangibles generally, see Note 16 to the Consolidated Financial Statements).

Macroeconomic and Geopolitical Challenges and Uncertainties Globally Could Have a Negative Impact on Citi's Businesses and Results of Operations.

Citi has experienced, and could experience in the future, negative impacts to its businesses and results of operations as a result of macroeconomic and geopolitical challenges, uncertainties and volatility. For example, changes in U.S. trade policies, which have resulted in retaliatory measures from other countries, could result in a reduction or realignment of trade flows among countries and negatively impact businesses, sectors and economic growth rates. Additional areas of uncertainty include, among others, geopolitical tensions and conflicts, natural disasters, election outcomes and other macroeconomic developments, such as those involving economic growth rates, consumer confidence and spending, employment rates and commodity prices.

Governmental fiscal and monetary actions, or expected actions, such as changes in interest rate policies and any balance sheet normalization program implemented by a central bank to reduce the size of its balance sheet could significantly impact interest rates, economic growth rates, the volatility of global financial markets, foreign exchange rates and capital flows among countries. For example, in 2017, the FRB began implementing a balance sheet normalization program to reduce the size of the central bank's balance sheet, although there are various uncertainties regarding the ultimate size of the balance sheet and its composition. Such actions could, among other things, result in higher interest rates. Although Citi estimates its overall net interest revenue would generally increase due to higher interest rates, higher rates could adversely affect Citi's funding costs, levels of deposits in its consumer and institutional businesses and certain business or product revenues.

As a result of the U.K.'s 2016 referendum on exiting the EU, numerous uncertainties have arisen regarding the U.K.'s potential exit from and future relationship with the EU. For example, the terms of a withdrawal continue to be negotiated within the U.K. and between the U.K. and the EU, and it is unclear whether the parties will be able to agree on terms prior to the currently scheduled exit on March 29, 2019. If no agreement is reached on terms of an exit, it could result in what is commonly referred to as a "cliff-edge" or "hard" exit scenario. A hard exit scenario would result in the U.K. and EU losing reciprocal financial services license-passporting rights and require the U.K. to deal with the EU as a third country regime, but without an equivalence regime or transition period in place. A hard exit scenario could cause severe disruptions in the movement of goods and services between the U.K. and EU countries and negatively impact financial markets and the U.K. and EU economies. Citi's business and operations could be impacted by these and other factors, including the preparedness and reaction of clients, counterparties and financial markets infrastructure. For information about Citi's actions to manage the U.K.'s potential exit from the EU, see "Managing Global Risk—Strategic Risk—Potential Exit of U.K. from EU" below. Further, the economic and fiscal situations of some EU countries have remained fragile, and concerns and uncertainties remain in Europe over the resulting effects of the U.K.'s potential exit from the EU.

These and other global macroeconomic and geopolitical challenges, uncertainties and volatilities have negatively impacted, and could continue to negatively impact, Citi's businesses, results of operations and financial condition, including its credit costs, revenues in its Markets and securities services and other businesses, and AOCI (which would in turn negatively impact Citi's book and tangible book value).

Citi's Presence in the Emerging Markets Subjects It to Various Risks as well as Increased Compliance and Regulatory Risks and Costs.

During 2018, emerging markets revenues accounted for approximately 37% of Citi's total revenues (Citi generally defines emerging markets as countries in Latin America, Asia (other than Japan, Australia and New Zealand), Central and Eastern Europe, the Middle East and Africa). Although Citi continues to pursue its target client strategy, Citi's presence in the emerging markets subjects it to a number of risks, including sovereign volatility, election outcomes, regulatory changes and political events, foreign exchange controls, limitations on foreign investment, sociopolitical instability (including from hyperinflation), fraud, nationalization or loss of licenses, business restrictions, sanctions or asset freezes, potential criminal charges, closure of branches or subsidiaries and confiscation of assets. For example, Citi operates in several countries that have, or have had in the past, strict foreign exchange controls, such as Argentina, that limit its ability to convert local currency into U.S. dollars and/or transfer funds outside of the country. In prior years, Citi has also discovered fraud in certain emerging markets in which it operates. Political turmoil and instability have occurred in certain regions and countries, including Asia, the Middle East and Latin America, which have required management time and attention in prior years (such as monitoring the impact of sanctions on certain emerging market economies as well as on Citi's businesses and results of operations in affected countries).

Citi's emerging markets presence also increases its compliance and regulatory risks and costs. For example, Citi's operations in emerging markets, including facilitating cross border transactions on behalf of its clients, subject it to higher compliance risks under U.S. regulations primarily focused on various aspects of global corporate activities, such as anti-money laundering regulations and the Foreign Corrupt Practices Act. These risks can be more acute in less-developed markets and thus require substantial investment in compliance infrastructure or could result in a reduction in certain of Citi's business activities. Any failure by Citi to comply with applicable U.S. regulations, as well as the regulations in the countries and markets in which it operates as a result of its global footprint, could result in fines, penalties, injunctions or other similar restrictions, any of which could negatively impact Citi's results of operations and reputation (see the implementation and interpretation of regulatory changes and legal and regulatory proceedings risk factors below).

Citi's Inability in Its Resolution Plan Submissions to Address Any Deficiencies Identified or Guidance Provided by the FRB and FDIC Could Subject Citi to More Stringent Capital, Leverage or Liquidity Requirements, or Restrictions on Its Growth, Activities or Operations, and Could Eventually Require Citi to Divest Assets or Operations.

Title I of the Dodd-Frank Act requires Citi to prepare and submit a plan to the FRB and the FDIC for the orderly resolution of Citigroup (the bank holding company) and its significant legal entities, under the U.S. Bankruptcy Code in the event of future material financial distress or failure. As previously announced, Citi's next resolution plan submission is due July 1, 2019. On December 20, 2018, the FRB and FDIC issued final guidance for the 2019 and subsequent resolution plan submissions for the eight U.S. GSIBs, including Citi. For additional information on Citi's resolution plan submissions, see "Managing Global Risk—Liquidity Risk" below.

Under Title I, if the FRB and the FDIC jointly determine that Citi's resolution plan is not "credible" (which, although not defined, is generally believed to mean the regulators do not believe the plan is feasible or would otherwise allow the regulators to resolve Citi in a way that protects systemically important functions without severe systemic disruption), or would not facilitate an orderly resolution of Citi under the U.S. Bankruptcy Code, and Citi fails to resubmit a resolution plan that remedies any identified deficiencies, Citi could be subjected to more stringent capital, leverage or liquidity requirements, or restrictions on its growth, activities or operations. If within two years from the imposition of any requirements or restrictions Citi has still not remediated any identified deficiencies, then Citi could eventually be required to divest certain assets or operations. Any such restrictions or actions would negatively impact Citi's reputation, market and investor perception, operations and strategy.

Citi’s Performance and the Performance of Its Individual Businesses Could Be Negatively Impacted if Citi Is Not Able to Effectively Compete for Highly Qualified Employees.

Citi’s performance and the performance of its individual businesses largely depends on the talents and efforts of its highly skilled employees. Specifically, Citi’s continued ability to compete in its businesses, to manage its businesses effectively and to continue to execute its overall global strategy depends on its ability to attract new employees and to retain and motivate its existing employees. If Citi is unable to continue to attract and retain the most highly qualified employees, Citi’s performance, including its competitive position, the successful execution of its overall strategy and its results of operations could be negatively impacted.

Citi’s ability to attract and retain employees depends on numerous factors, some of which are outside of its control. For example, the banking industry generally is subject to more comprehensive regulation of executive and employee compensation than other industries, including deferral and clawback requirements for incentive compensation. Citi often competes in the market for talent with entities that are not subject to such comprehensive regulatory requirements on the structure of incentive compensation, including, among others,

technology companies. Other factors that could impact Citi's ability to attract and retain employees include its culture and the management and leadership of the Company as well as its individual businesses, presence in the particular market or region at issue and the professional opportunities it offers.

Financial Services Companies and Others as well as Emerging Technologies Pose Increasingly Competitive Challenges to Citi.

Citi operates in an increasingly competitive environment, which includes both financial and non-financial services firms, such as traditional banks, online banks, financial technology companies and others. These companies compete on the basis of, among other factors, size, quality and type of products and services offered, price, technology and reputation. Emerging technologies have the potential to intensify competition and accelerate disruption in the financial services industry. Citi competes with financial services companies in the U.S. and globally that continue to develop and introduce new products and services. In recent years, non-financial services firms, such as financial technology companies, have begun to offer services traditionally provided by financial institutions, such as Citi. These firms attempt to use technology and mobile platforms to enhance the ability of companies and individuals to borrow money, save and invest. To the extent Citi is not able to compete effectively with these and other firms, Citi could be placed at a competitive disadvantage, which could result in loss of customers and market share, and its businesses, results of operations and financial condition could suffer. For additional information on Citi's competitors, see the co-brand and private label cards risk factor above and "Supervision, Regulation and Other—Competition" below.

Uncertainties Regarding the Possible Discontinuance of the London Inter-Bank Offered Rate (LIBOR) or Any Other Interest Rate Benchmark Could Have Adverse Consequences for Market Participants, Including Citi.

In 2017, the U.K. Financial Conduct Authority (FCA) noted that market conditions raised serious questions about the future sustainability of LIBOR benchmarks. With the FCA securing voluntary panel bank support to sustain LIBOR only until 2021, the future of LIBOR beyond 2021 remains uncertain. In addition, following guidance provided by the Financial Stability Board (FSB), other regulators have suggested reforming or replacing other benchmark rates with alternative reference rates.

Given LIBOR's extensive use across financial markets, the transition away from LIBOR presents various risks and challenges to financial markets and institutions, including Citi. Citi's consumer and institutional businesses issue, trade, hold or otherwise use various products and securities that reference LIBOR, including, among others, mortgages and other consumer loans, commercial loans, corporate loans, various types of debt, derivatives and other securities. If not sufficiently planned for, the discontinuation of LIBOR or any other interest rate benchmark could result in increased financial, operational, legal, reputational or compliance risks. For example, a significant challenge will be the impact of LIBOR transition on contractual mechanics of floating rate

financial instruments and contracts that reference LIBOR and mature after 2021. Certain of these instruments and contracts do not provide for alternative reference rates. Even if the instruments and contracts transition to alternative reference rates, the new reference rates are likely to differ from the prior benchmark rates. While there are a number of international working groups focused on transition plans and fallback contract language that seek to address market disruption and value transfer, replacement of LIBOR or any other benchmark with a new benchmark rate could adversely impact the value of and return on existing instruments and contracts. Moreover, replacement of LIBOR or other benchmark rates could result in market dislocations and have other adverse consequences for market participants, including the potential for increased costs, including by requiring Citi to pay higher interest on its obligations, and litigation risks. For information about Citi's management of LIBOR transition risk, see "Managing Global Risk—Strategic Risk—LIBOR Transition Risk" below.

CREDIT RISKS

Credit Risk and Concentrations of Risk Can Increase the Potential for Citi to Incur Significant Losses.

Credit risk arises from Citi's lending and other businesses in both GCB and ICG. Citi has credit exposures to counterparties in the U.S. and various countries and jurisdictions globally, including end-of-period consumer loans of

$331 billion and end-of-period corporate loans of $354 billion at year-end 2018. A default by a borrower or counterparty, or a decline in the credit quality or value of any underlying collateral, exposes Citi to credit risk. Various macroeconomic, geopolitical and other factors, among other things, can increase Citi's credit risk and credit costs (for additional information, see co-branding and private label credit card and macroeconomic challenges and uncertainties risk factors above). While Citi provides reserves for probable losses for its credit exposures, such reserves are subject to judgments and estimates that could be incorrect or differ from actual future events (see incorrect assumptions or estimates risk factor below). For additional information on Citi's credit and country risk, see each respective business' results of operations above and "Managing Global Risk—Credit Risk" and "Managing Global Risk—Strategic Risk—Country Risk" below and Note 14 to the Consolidated Financial Statements.

Concentrations of risk, particularly credit and market risks, can also increase Citi's risk of significant losses. As of year-end 2018, Citi's most significant concentration of credit risk was with the U.S. government and its agencies, which primarily results from trading assets and investments issued by the U.S. government and its agencies (for additional information, including concentrations of credit risk to other public sector entities, see Note 23 to the Consolidated Financial Statements). Citi also routinely executes a high volume of securities, trading, derivative and foreign exchange transactions with non-U.S. sovereigns and with counterparties in the financial services industry, including banks, insurance companies, investment banks, governments, central banks and other financial institutions. A rapid deterioration of a large counterparty or within a sector or country where Citi has large

exposures or unexpected market dislocations could cause Citi to incur significant losses.

LIQUIDITY RISKS

The Maintenance of Adequate Liquidity and Funding Depends on Numerous Factors, Including Those Outside of Citi's Control, Such as Market Disruptions and Increases in Citi's Credit Spreads.

As a global financial institution, adequate liquidity and sources of funding are essential to Citi's businesses. Citi's liquidity and sources of funding can be significantly and negatively impacted by factors it cannot control, such as general disruptions in the financial markets, governmental fiscal and monetary policies, regulatory changes or negative investor perceptions of Citi's creditworthiness, unexpected increases in cash or collateral requirements and the inability to monetize available liquidity resources. For example, Citi competes with other banks and financial institutions for deposits, which represent Citi's most stable and lowest cost of long-term funding. The competitive environment has increased for retail banking deposits, including as online banks and other competitors have increased rates paid for deposits. More recently, as interest rates have increased, a growing number of customers have transferred deposits to other products, including investments and interest bearing accounts, and/or other financial institutions. This, along with slower industry growth in deposits, has resulted in a more challenging environment for deposits. In addition, as interest rates continue to rise, financial institutions, such as Citi, may have to raise the rates paid for deposits, thus increasing the cost of funds and affecting net interest income and margin.

Moreover, Citi's costs to obtain and access secured funding and long-term unsecured funding are directly related to its credit spreads. Changes in credit spreads constantly occur and are market driven, including both external market factors and factors specific to Citi, and can be highly volatile. For additional information on Citi's primary sources of funding, see "Liquidity Risk" below.

In addition, Citi's ability to obtain funding may be impaired if other market participants are seeking to access the markets at the same time, or if market appetite is reduced, as is likely to occur in a liquidity or other market crisis. A sudden drop in market liquidity could also cause a temporary or lengthier dislocation of underwriting and capital markets activity. In addition, clearing organizations, central banks, clients and financial institutions with which Citi interacts may exercise the right to require additional collateral based on these market perceptions or market conditions, which could further impair Citi's access to and cost of funding.

As a holding company, Citi relies on interest, dividends, distributions and other payments from its subsidiaries to fund dividends as well as to satisfy its debt and other obligations. Several of Citi's U.S. and non-U.S. subsidiaries are or may be subject to capital adequacy or other regulatory or contractual restrictions on their ability to provide such payments, including any local regulatory stress test requirements. Limitations on the payments that Citi receives from its subsidiaries could also impact its liquidity.

The Credit Rating Agencies Continuously Review the Credit Ratings of Citi and Certain of Its Subsidiaries, and Ratings Downgrades Could Have a Negative Impact on Citi's Funding and Liquidity Due to Reduced Funding Capacity and Increased Funding Costs, Including Derivatives Triggers That Could Require Cash Obligations or Collateral Requirements.

The credit rating agencies, such as Fitch, Moody's and S&P, continuously evaluate Citi and certain of its subsidiaries, and their ratings of Citi and its more significant subsidiaries' long-term/senior debt and short-term/commercial paper, as applicable, are based on a number of factors, including standalone financial strength, as well as factors not entirely within the control of Citi and its subsidiaries, such as the agencies' proprietary rating methodologies and assumptions, and conditions affecting the financial services industry and markets generally.

Citi and its subsidiaries may not be able to maintain their current respective ratings. Ratings downgrades could negatively impact Citi's ability to access the capital markets and other sources of funds as well as the costs of those funds, and its ability to maintain certain deposits. A ratings downgrade could also have a negative impact on Citi's funding and liquidity due to reduced funding capacity, as well as the impact of derivative triggers, which could require Citi to meet cash obligations and collateral requirements. In addition, a ratings downgrade could also have a negative impact on other funding sources, such as secured financing and other margined transactions for which there may be no

explicit triggers, as well as on contractual provisions and other credit requirements of Citi's counterparties and clients, which may contain minimum ratings thresholds in order for Citi to hold third-party funds.

Moreover, credit ratings downgrades can have impacts that may not be currently known to Citi or are not possible to quantify. For example, some entities may have ratings limitations as to their permissible counterparties, of which Citi may or may not be aware. Further, certain of Citi's corporate customers and trading counterparties, among other clients, could re-evaluate their business relationships with Citi and limit the trading of certain contracts or market instruments with Citi in response to ratings downgrades. Changes in customer and counterparty behavior could impact not only Citi's funding and liquidity but also the results of operations of certain Citi businesses. For additional information on the potential impact of a reduction in Citi's or Citibank's credit ratings, see "Managing Global Risk—Liquidity Risk" below.

OPERATIONAL RISKS

A Disruption of Citi's Operational Systems Could Negatively Impact Citi's Reputation, Customers, Clients, Businesses or Results of Operations and Financial Condition.

A significant portion of Citi's operations relies heavily on the secure processing, storage and transmission of confidential and other information as well as the monitoring of a large number of complex transactions on a minute-by-minute basis. For example, through its GCB and treasury and trade solutions and securities services businesses in ICG, Citi obtains and stores an extensive amount of personal and client-specific information for its retail, corporate and governmental customers and clients and must accurately record and reflect their extensive account transactions.

With the evolving proliferation of new technologies and the increasing use of the Internet, mobile devices and cloud technologies to conduct financial transactions, large global financial institutions such as Citi have been, and will continue to be, subject to an increasing risk of operational disruption or cyber or information security incidents from these activities (for additional information on cybersecurity risk, see the discussion below). These incidents are unpredictable and can arise from numerous sources, not all of which are in Citi's control, including, among others, human error, fraud or malice on the part of employees, accidental technological failure, electrical or telecommunication outages, failures of computer servers or other similar damage to Citi's property or assets. These issues can also arise as a result of failures by third parties with which Citi does business, such as failures by Internet, mobile technology and cloud service providers or other vendors to adequately safeguard their systems and prevent system disruptions or cyber attacks.

Such events could cause interruptions or malfunctions in the operations of Citi (such as the temporary loss of availability of Citi's online banking system or mobile banking platform), as well as the operations of its clients, customers or other third parties. Given Citi's global footprint and the high volume of transactions processed by Citi, certain errors or actions may be repeated or compounded before they are discovered and rectified, which would further increase these costs and consequences. Any such events could also result in financial losses as well as misappropriation, corruption or loss of confidential and other information or assets, which could negatively impact Citi's reputation, customers, clients, businesses or results of operations and financial condition, perhaps significantly.

Citi and Third Parties' Computer Systems and Networks Have Been, and Will Continue to Be, Susceptible to an Increasing Risk of Continually Evolving, Sophisticated Cybersecurity Activities That Could Result in the Theft, Loss, Misuse or Disclosure of Confidential Client or Customer Information, Damage to Citi's Reputation, Additional Costs to Citi, Regulatory Penalties, Legal Exposure and Financial Losses.

Citi's computer systems, software and networks are subject to ongoing cyber incidents such as unauthorized access, loss or destruction of data (including confidential client information),

account takeovers, unavailability of service, computer viruses or other malicious code, cyber attacks and other similar events. These threats can arise from external parties, including cyber criminals, cyber terrorists, hacktivists and nation state actors, as well as insiders who knowingly or unknowingly engage in or enable malicious cyber activities.

Third parties with which Citi does business, as well as retailers and other third parties with which Citi's customers do business, may also be sources of cybersecurity risks, particularly where activities of customers are beyond Citi's security and control systems. For example, Citi outsources certain functions, such as processing customer credit card transactions, uploading content on customer-facing websites, and developing software for new products and services. These relationships allow for the storage and processing of customer information by third-party hosting of or access to Citi websites, which could result in compromise or the potential to introduce vulnerable or malicious code, resulting in security breaches impacting Citi customers. Furthermore, because financial institutions are becoming increasingly interconnected with central agents, exchanges and clearing houses, including as a result of the derivatives reforms over the last few years, Citi has increased exposure to cyber attacks through third parties.

Citi has been subject to intentional cyber incidents from external sources over the last several years, including (i) denial of service attacks, which attempted to interrupt service to clients and customers, (ii) data breaches, which obtained unauthorized access to customer account data and (iii) malicious software attacks on client systems, which

attempted to allow unauthorized entrance to Citi's systems under the guise of a client and the extraction of client data. While Citi's monitoring and protection services were able to detect and respond to the incidents targeting its systems before they became significant, they still resulted in limited losses in some instances as well as increases in expenditures to monitor against the threat of similar future cyber incidents. There can be no assurance that such cyber incidents will not occur again, and they could occur more frequently and on a more significant scale.

Further, although Citi devotes significant resources to implement, maintain, monitor and regularly upgrade its systems and networks with measures such as intrusion detection and prevention and firewalls to safeguard critical business applications, there is no guarantee that these measures or any other measures can provide absolute security. Because the methods used to cause cyber attacks change frequently or, in some cases, are not recognized until launched or even later, Citi may be unable to implement effective preventive measures or proactively address these methods until they are discovered. In addition, given the evolving nature of cyber threat actors and the frequency and sophistication of cyber activities they carry out, the determination of the severity and potential impact of a cyber incident may not occur for a substantial period until after the incident has been discovered. Also, while Citi engages in certain actions to reduce the exposure resulting from outsourcing, such as performing security control assessments of third-party vendors and limiting third-party access to the

least privileged level necessary to perform job functions, these actions cannot prevent all third-party related cyber attacks or data breaches.

Cyber incidents can result in the disclosure of personal, confidential or proprietary customer or client information, damage to Citi's reputation with its clients and the market, customer dissatisfaction and additional costs, including credit costs, to Citi, such as repairing systems, replacing customer payment cards or adding new personnel or protection technologies. Regulatory penalties, loss of revenues, exposure to litigation and other financial losses, including loss of funds, to both Citi and its clients and customers and disruption to Citi's operational systems could also result from cyber incidents (for additional information on the potential impact of operational disruptions, see the operational systems risk factor above). Moreover, the increasing risk of cyber incidents has resulted in increased legislative and regulatory scrutiny of firms' cybersecurity protection services and calls for additional laws and regulations to further enhance protection of consumers' personal data.

While Citi maintains insurance coverage that may, subject to policy terms and conditions including significant self-insured deductibles, cover certain aspects of cyber risks, such insurance coverage may be insufficient to cover all losses.

For additional information about Citi's management of cybersecurity risk, see "Managing Global Risk—Operational Risk—Cybersecurity Risk" below.

Incorrect Assumptions or Estimates in Citi's Financial Statements Could Cause Significant Unexpected Losses in the Future, and Changes to Financial Accounting and Reporting Standards or Interpretations Could Have a Material Impact on How Citi Records and Reports Its Financial Condition and Results of Operations.

U.S. GAAP requires Citi to use certain assumptions and estimates in preparing its financial statements, including reserves related to litigation and regulatory exposures, valuation of DTAs, the estimate of the allowance for credit losses and the fair values of certain assets and liabilities, among other items. If Citi's assumptions or estimates underlying its financial statements are incorrect or differ from actual events, Citi could experience unexpected losses, some of which could be significant.

Periodically, the Financial Accounting Standards Board (FASB) issues financial accounting and reporting standards that may govern key aspects of Citi's financial statements or interpretations thereof when those standards become effective, including those areas where Citi is required to make assumptions or estimates. For example, the FASB's new accounting standard on credit losses (CECL), which will become effective for Citi on January 1, 2020, will require earlier recognition of credit losses on loans and held-to-maturity securities and other financial assets. The CECL methodology requires that lifetime "expected credit losses" be recorded at the time the financial asset is originated or acquired. The expected credit losses are adjusted each period for changes in expected lifetime credit losses. The CECL methodology replaces the multiple existing impairment

models under U.S. GAAP that generally require that a loss be "incurred" before it is recognized. For additional information on this and other accounting standards, including the expected impacts on Citi's results of operations and financial condition, see "Future Application of Accounting Standards" below.

Changes to financial accounting or reporting standards or interpretations, whether promulgated or required by the FASB or other regulators, could present operational challenges and could require Citi to change certain of the assumptions or estimates it previously used in preparing its financial statements, which could negatively impact how it records and reports its financial condition and results of operations generally and/or with respect to particular businesses. For additional information on the key areas for which assumptions and estimates are used in preparing Citi's financial statements, see "Significant Accounting Policies and Significant Estimates" below and Notes 1 and 27 to the Consolidated Financial Statements.

Citi May Incur Significant Losses and Its Regulatory Capital and Capital Ratios Could Be Negatively Impacted if Its Risk Management Processes, Strategies or Models Are Deficient or Ineffective.

Citi utilizes a broad and diversified set of risk management and mitigation processes and strategies, including the use of risk models in analyzing and monitoring the various risks Citi assumes in conducting its activities. For example, Citi uses models as part of its comprehensive stress testing initiatives across Citi. Citi also relies on data to aggregate,

assess and manage various risk exposures. Management of these risks is made even more challenging within a global financial institution such as Citi, particularly given the complex, diverse and rapidly changing financial markets and conditions in which Citi operates as well as that losses can occur from untimely, inaccurate or incomplete processes caused by unintentional human error.

These processes, strategies and models are inherently limited because they involve techniques, including the use of historical data in many circumstances, assumptions and judgments that cannot anticipate every economic and financial outcome in the markets in which Citi operates, nor can they anticipate the specifics and timing of such outcomes. Citi could incur significant losses, and its regulatory capital and capital ratios could be negatively impacted, if Citi's risk management processes, including its ability to manage and aggregate data in a timely and accurate manner, strategies or models are deficient or ineffective. Such deficiencies or ineffectiveness could also result in inaccurate financial, regulatory or risk reporting.

Moreover, Citi's Basel III regulatory capital models, including its credit, market and operational risk models, currently remain subject to ongoing regulatory review and approval, which may result in refinements, modifications or enhancements (required or otherwise) to these models. Modifications or requirements resulting from these ongoing reviews, as well as any future changes or guidance provided by the U.S. banking agencies regarding the regulatory capital framework applicable to Citi, have resulted in, and could continue to result in, significant changes to Citi's risk-

weighted assets. These changes can negatively impact Citi's capital ratios and its ability to achieve its regulatory capital requirements as it projects or as required.

COMPLIANCE RISKS

Ongoing Implementation and Interpretation of Regulatory Changes and Requirements in the U.S. and Globally Have Increased Citi's Compliance Risks and Costs.

As referenced above, over the past several years, Citi has been required to implement a significant number of regulatory changes across all of its businesses and functions, and these changes continue. In some cases, Citi's implementation of a regulatory requirement is occurring simultaneously with changing or conflicting regulatory guidance, legal challenges or legislative action to modify or repeal existing rules or enact new rules. Moreover, in many cases, these are entirely new regulatory requirements or regimes, resulting in much uncertainty regarding regulatory expectations as to what is definitely required in order to be in compliance. Accompanying this compliance uncertainty is heightened regulatory scrutiny and expectations in the U.S. and globally for the financial services industry with respect to governance and risk management practices, including its compliance and regulatory risks (for a discussion of heightened regulatory expectations on "conduct risk" at, and the overall "culture" of, financial institutions such as Citi, see the legal and regulatory proceedings risk factor below). A failure to resolve any identified deficiencies could result in increased regulatory oversight and restrictions. All of these factors have resulted in increased compliance risks and costs for Citi.

Examples of regulatory changes that have resulted in increased compliance risks and costs include (i) a proliferation of laws relating to the limitation of cross-border data movement and/or collection and use of customer information, including data localization and protection and privacy laws, which also can conflict with or increase compliance complexity with respect to other laws, including anti-money laundering laws; and (ii) the FRB's "total loss absorbing capacity" (TLAC) requirements, including, among other things, consequences of a breach of the clean holding company requirements, given there are no cure periods for the requirements.

Extensive compliance requirements can result in increased reputational and legal risks, as failure to comply with regulations and requirements, or failure to comply as expected, can result in enforcement and/or regulatory proceedings (for additional discussion, see the legal and regulatory proceedings risk factor below). Additionally, increased and ongoing compliance requirements and uncertainties have resulted in higher costs for Citi. For example, Citi employed roughly 30,000 risk, regulatory and compliance staff as of year-end 2018, out of a total employee population of 204,000, compared to approximately 14,000 as of year-end 2008 with a total employee population of 323,000. These higher regulatory and compliance costs can impede Citi's ongoing, business-as-usual cost reduction efforts, and can also require management to reallocate resources, including

potentially away from ongoing business investment initiatives, as discussed above.

Citi Is Subject to Extensive Legal and Regulatory Proceedings, Investigations and Inquiries That Could Result in Significant Penalties and Other Negative Impacts on Citi, Its Businesses and Results of Operations.

At any given time, Citi is defending a significant number of legal and regulatory proceedings and is subject to numerous governmental and regulatory examinations, investigations and other inquiries. The global judicial, regulatory and political environment has generally been unfavorable for large financial institutions. The complexity of the federal and state regulatory and enforcement regimes in the U.S., coupled with the global scope of Citi's operations, also means that a single event or issue may give rise to a large number of overlapping investigations and regulatory proceedings, either by multiple federal and state agencies in the U.S. or by multiple regulators and other governmental entities in different jurisdictions, as well as multiple civil litigation claims in multiple jurisdictions. Moreover, U.S. and non-U.S. regulators have been increasingly focused on "conduct risk," a term used to describe the risks associated with behavior by employees and agents, including third-party vendors utilized by Citi, that could harm clients, customers, investors or the markets, such as improperly creating, selling, marketing or managing products and services or improper incentive compensation programs with respect thereto, failures to safeguard a party's personal information, or failures to identify and manage conflicts of interest. In addition to increasing Citi's

compliance and reputational risks, this focus on conduct risk could lead to more regulatory or other enforcement proceedings and civil litigation, including for practices, which historically were acceptable but now receive greater scrutiny. Further, while Citi takes numerous steps to prevent and detect conduct by employees and agents that could potentially harm clients, customers, investors or the markets, such behavior may not always be deterred or prevented. Banking regulators have also focused on the overall culture of financial services firms, including Citi. In addition to regulatory restrictions or structural changes that could result from perceived deficiencies in Citi's culture, such focus could also lead to additional regulatory proceedings.

In addition, the severity of the remedies sought in legal and regulatory proceedings to which Citi is subject has remained elevated. U.S. and certain international governmental entities have increasingly brought criminal actions against, or have sought criminal convictions from, financial institutions, and criminal prosecutors in the U.S. have increasingly sought and obtained criminal guilty pleas or deferred prosecution agreements against corporate entities and other criminal sanctions from those institutions. These types of actions by U.S. and international governmental entities may, in the future, have significant collateral consequences for a financial institution, including loss of customers and business, and the inability to offer certain products or services and/or operate certain businesses. Citi may be required to accept or be subject to similar types of criminal remedies, consent orders, sanctions, substantial fines and penalties, remediation

and other financial costs or other requirements in the future, including for matters or practices not yet known to Citi, any of which could materially and negatively affect Citi's businesses, business practices, financial condition or results of operations, require material changes in Citi's operations or cause Citi reputational harm.

Further, many large claims—both private civil and regulatory—asserted against Citi are highly complex, slow to develop and may involve novel or untested legal theories. The outcome of such proceedings is difficult to predict or estimate until late in the proceedings. Although Citi establishes accruals for its legal and regulatory matters according to accounting requirements, Citi's estimates of, and changes to, these accruals involve significant judgment and may be subject to significant uncertainty, and the amount of loss ultimately incurred in relation to those matters may be substantially higher than the amounts accrued. In addition, certain settlements are subject to court approval and may not be approved.

For additional information relating to Citi's legal and regulatory proceedings and matters, including Citi's policies on establishing legal accruals, see Note 27 to the Consolidated Financial Statements.

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(1) For additional information regarding certain credit risk, market risk and other quantitative and qualitative information, refer to Citi's Pillar 3 Basel III Advanced Approaches Disclosures, as required by the rules of the

Federal Reserve Board, on Citi's Investor Relations website.

(2) See "Long-Term Debt—Resolution Plan" below for a description of the consequences to unsecured debt holders in the event of Citi's bankruptcy.

MANAGING GLOBAL RISK

Overview

For Citi, effective risk management is of primary importance to its overall operations. Accordingly, Citi's risk management process has been designed to monitor, evaluate and manage the principal risks it assumes in conducting its activities. Specifically, the activities that Citi engages in, and the risks those activities generate, must be consistent with Citi's mission and value proposition, the key principles that guide it, and Citi's risk appetite.

Risk management must be built on a foundation of ethical culture. Under Citi's mission and value proposition, which was developed by Citi's senior leadership and distributed throughout the Company, Citi strives to serve its clients as a trusted partner by responsibly providing financial services that enable growth and economic progress while earning and maintaining the public's trust by constantly adhering to the highest ethical standards. As such, Citi asks all employees to ensure that their decisions pass three tests: they are in our clients' interests, create economic value and are always systemically responsible. Additionally, Citi evaluates employees' performance against behavioral expectations set out in Citi's leadership standards, which were designed in part to effectuate Citi's mission and value proposition. Other culture-related efforts in connection with conduct risk, ethics and leadership, escalation and treating customers fairly help Citi to execute its mission and value proposition.

Citi's Company-wide risk governance framework consists of the policies, standards, procedures and processes through which Citi identifies, assesses, measures, manages, monitors, reports and controls risks across the Company. It also emphasizes Citi's risk culture and lays out standards, procedures and programs that are designed and undertaken to enhance the Company's risk culture, embed this culture deeply within the organization, and give employees tools to make sound and ethical risk decisions and to escalate issues appropriately. The risk governance framework has been developed in alignment with the expectations of the Office of the Comptroller of the Currency (OCC) Heightened Standards. It is also aligned with the relevant components of the Basel Committee on Banking Supervision's corporate governance principles for banks and relevant components of the Federal Reserve's Enhanced Prudential Standards for Bank Holding Companies and Foreign Banking Organizations.

Four key principles—common purpose, responsible finance, ingenuity and leadership—guide Citi as it performs its mission. Citi's risk appetite, which is approved by the Citigroup Board of Directors, specifies the aggregate levels and types of risk the Board and management are willing to assume to achieve Citi's strategic objectives and business plan, consistent with applicable capital, liquidity and other regulatory requirements.

Citi selectively takes risks in support of its underlying business strategy, while striving to ensure it operates within its mission and value proposition and risk appetite.

Citi's risks are generally categorized and summarized as follows:

- Credit risk is the risk of loss resulting from the decline in credit quality (or downgrade risk) or failure of a borrower, counterparty, third party or issuer to honor its financial or contractual obligations.
- Liquidity risk is the risk that the Company will not be able to meet efficiently both expected and unexpected current and future cash flow and collateral needs without adversely affecting either daily operations or financial conditions of the Company. The risk may be exacerbated by the inability of the Company to access funding sources or monetize assets and the composition of liability funding and liquid assets.
- Market risk is the risk of loss arising from changes in the value of Citi's assets and liabilities resulting from changes in market variables, such as interest rates, exchange rates or credit spreads. Losses can be exacerbated by the presence of basis or correlation risks.
- Operational risk is the risk of loss resulting from inadequate or failed internal processes, systems or human factors, or from external events. It includes risk of failing to comply with applicable laws and regulations, but excludes strategic risk (see below). It also includes the reputation and franchise risk associated with business practices or market conduct in which Citi is involved, as well as compliance, conduct and legal risks. Operational risk is inherent in Citi's global business activities, as well as related support, and can result in losses arising from events related to fraud, theft and unauthorized activity; employment practices and workplace environment; clients, products and business practices; physical assets and infrastructure, and execution, delivery and process management.

Compliance risk is the risk to current or projected financial condition and resilience arising from violations of laws or regulations, or from nonconformance with prescribed practices, internal policies and procedures, or ethical standards. This risk exposes a bank to fines, civil money penalties, payment of damages and the voiding of contracts.

- Compliance risk is not limited to risk from failure to comply with consumer protection laws; it encompasses the risk of noncompliance with all laws and regulations, as well as prudent ethical standards and contractual obligations. It also includes the exposure to litigation (known as legal risk) from all aspects of banking, traditional and nontraditional. Compliance risk spans across all risk types outlined in the risk governance framework.
- Reputational risk is the risk to current or anticipated earnings, capital, or franchise or enterprise value and resilience arising from negative public opinion.
- Strategic risk is the risk to current or anticipated earnings, capital, or franchise or enterprise value arising from poor, but authorized business decisions (in compliance with regulations, policies and procedures), an inability to adapt to changes in the operating environment or other external factors that may impair the ability to carry out a business strategy. Strategic risk also includes:

- Country risk, which is the risk that an event in a country (precipitated by developments within or

external to a country) will impair the value of Citi's franchise or will adversely affect the ability of obligors within that country to honor their obligations. Country risk events may include sovereign defaults, banking crises, currency crises, currency convertibility and/or transferability restrictions or political events.

Citi manages its risks through each of its three lines of defense: (i) business management, (ii) independent control functions and (iii) internal audit. The three lines of defense collaborate with each other in structured forums and processes to bring various perspectives together and to lead the organization toward outcomes that are in clients' interests, create economic value and are systemically responsible.

First Line of Defense: Business Management

Each of Citi's businesses owns its risks and is responsible for identifying, assessing and managing its risks. Each business is also responsible for establishing and operating controls to mitigate key risks, assessing internal controls and promoting a culture of compliance and control. In doing so, a business is required to maintain appropriate staffing and implement appropriate procedures to fulfill its risk governance responsibilities.

The CEOs of each region and business report to the Citigroup CEO. The Head of Enterprise Infrastructure, Operations and Technology (EIO&T), who is considered part of the first line of defense, also reports to the Citigroup CEO.

Businesses at Citi organize and chair committees and councils that cover risk considerations with participation from independent control functions, including committees or councils that are designed to consider matters related to capital, assets and liabilities, business practices, business risks and controls, mergers and acquisitions, the Community Reinvestment Act and fair lending and incentives.

Second Line of Defense: Independent Control Functions

Citi's independent control functions, including Risk, Independent Compliance Risk Management, Human Resources, Legal and Finance, set standards by which Citi and its businesses manage and oversee risks, including compliance with applicable laws, regulatory requirements, policies and other relevant standards of conduct. Additionally, among other responsibilities, the independent control functions provide advice and training to Citi's businesses and establish tools, methodologies, processes and oversight for controls used by the businesses to foster a culture of compliance and control.

Risk

The Risk organization is designed to act as an independent partner of the business to manage market, credit and operational risk in a manner consistent with Citi's risk appetite. Risk establishes policies and guidelines for risk assessments and risk management and contributes to controls and tools to manage, measure and mitigate risks taken by the Company.

There is an independent Chief Risk Officer for each of Citi's consumer, commercial and corporate lending businesses

within ICG and GCB (Business CROs). Each of these Business CROs reports directly to Citi's Chief Risk Officer. The Business CROs are the focal point for most day-to-day risk decisions, such as setting risk limits and approving transactions within the businesses. In addition there are Regional and Legal Entity Chief Risk Officers. There are independent Chief Risk Officers for Asia, EMEA and Latin America, including Mexico (Regional CROs). Each of these Regional CROs reports directly to Citi's Chief Risk Officer. The Regional CROs are accountable for overseeing the management of all risks in their geographic areas and across businesses, and are the primary risk contacts for the Regional Chief Executive Officers and local regulators. Legal Entity Chief Risk Officers are responsible for identifying and managing risks in Citibank as well as other specific legal entities.

The Citi Chief Risk Officer reports to the Citigroup CEO and the Risk Management Committee of the Citigroup Board of Directors. The Chief Risk Officer has regular and unrestricted access to the Risk Management Committee of the Board and also to the Citigroup Board of Directors to address risks and issues identified through Risk's activities.

Independent Compliance Risk Management

The Independent Compliance Risk Management (ICRM) organization is designed to protect Citi by overseeing senior management, the businesses and other control functions in managing compliance risk, as well as promoting business conduct and activity that is consistent with Citi's mission and value proposition. Citi's objective is to embed an enterprise-wide compliance risk management framework and culture that identifies, measures, monitors, mitigates and controls compliance risk across the three lines of defense. For further information on Citi's compliance risk framework, see "Compliance Risk" below.

The Chief Compliance Officer reports to the Citigroup CEO and has regular and unrestricted access to the committees of the Citigroup Board of Directors, including the Audit Committee and the Ethics and Culture Committee.

Human Resources

The Human Resources (HR) organization provides personnel support and governance in connection with, among other things: recognizing and rewarding employees who demonstrate Citi's values and excel in their roles and responsibilities; setting ethical and performance-related expectations and developing and promoting employees who meet those expectations, and searching for, assessing and hiring staff who exemplify Citi's leadership standards, which outline Citi's expectations of its employees' behavior. Through these activities, HR serves primarily as an independent control function advising business management, escalating identified risks and establishing policies or processes to manage risk. For select activities HR also acts in a first line capacity and is subject to appropriate review and challenge by second line functions.

The Head of Human Resources reports to the Citigroup CEO and interacts regularly with the Personnel and Compensation Committee of the Citigroup Board of Directors.

Legal

The Legal organization is involved in a number of activities designed to promote the appropriate management of Citi's exposure to legal risk, which includes the risk of loss, whether financial or reputational, due to legal or regulatory actions, proceedings or investigations, or uncertainty in the applicability or interpretation of contracts, laws or regulations. Activities designed to promote appropriate management of legal risk include, among others: promoting and supporting Citigroup's governance processes; advising business management, other independent control functions, the Citigroup Board of Directors and committees of the Board regarding analysis of laws and regulations, regulatory matters, disclosure matters, and potential risks and exposures on key litigation and transactional matters, among other things; advising other independent control functions in their efforts to ensure compliance with applicable laws and regulations as well as internal standards of conduct; serving on key management committees; reporting and escalating key legal issues to senior management or other independent control functions; participating in internal investigations and overseeing regulatory investigations, and advising businesses on a day-to-day basis on legal, regulatory and contractual matters.

The General Counsel reports to the Citigroup CEO and is responsible to the full Citigroup Board. In addition to having regular and unrestricted access to the full Citigroup Board of Directors, the General Counsel or his/her delegates regularly attend meetings of the Risk Management Committee, Audit Committee, Personnel and Compensation Committee, Ethics and Culture Committee, Operations and Technology Committee, and Nomination, Governance and Public Affairs Committee, as well as other ad hoc committees of the Citigroup Board of Directors.

Finance

The Finance organization is primarily composed of the following disciplines: treasury, controllers, tax and financial planning and analysis, capital planning/recovery and resolution planning, corporate M&A and investor relations. These disciplines partner with the businesses, providing key data and consultation to facilitate sound decisions in support of the businesses' objectives. Through these activities, Finance serves primarily as an independent control function advising business management, escalating identified risks and establishing policies or processes to manage risk. For select activities Finance also acts in a first line capacity and is subject to appropriate review and challenge by second line functions.

Through the treasury discipline, Finance has overall responsibility for managing Citi's balance sheet and accordingly partners with the businesses to manage Citi's liquidity and interest rate risk (price risk for non-trading portfolios). Treasury works with the businesses to establish balance sheet targets and limits, as well as sets policies on funding costs charged for business assets based on their liquidity and duration.

Principally through the controllers discipline, Finance is responsible for establishing a strong control environment over Citi's financial reporting processes consistent with the 2013 Committee of Sponsoring Organizations of the Treadway Commission, or COSO, Internal Control-Integrated Framework.

Finance is led by Citi's Chief Financial Officer (CFO), who reports directly to the Citigroup CEO. The CFO chairs or co-chairs several management committees that serve as key governance and oversight forums for business activities. In addition, the CFO has regular and unrestricted access to the full Citigroup Board of Directors as well as to the Audit Committee of the Board of Directors.

Third Line of Defense: Internal Audit

Citi's Internal Audit function independently reviews activities of the first two lines of defense based on a risk-based audit plan and methodology approved by the Audit Committee of the Citigroup Board of Directors. Internal Audit also provides independent assurance to the Citigroup Board of Directors, the Audit Committee of the Board, senior management and regulators regarding the effectiveness of Citi's governance and controls designed to mitigate Citi's exposure to risks and to enhance Citi's culture of compliance and control.

The Chief Auditor reports functionally to the Chairman of the Citigroup Audit Committee and administratively to the CEO of Citigroup. Internal Audit's responsibilities are carried out independently under the oversight of the Audit Committee. Internal Audit's employees accordingly report to the Chief Auditor and do not have reporting lines to

front-line units or senior management. Internal Audit’s staff members are not permitted to provide internal-audit services for a business line or function in which they had business line or function responsibilities within the previous 12 months.

Three Lines of Defense

Citigroup Board of Directors and Committees of the Board

Citigroup's Board of Directors oversees Citi's risk-taking activities and holds management accountable for adhering to the risk governance framework. To do so, directors review reports prepared by the businesses, Risk, Independent Compliance Risk Management, Internal Audit and others, and exercise sound independent judgment to question, probe and challenge recommendations and decisions made by management.

The standing committees of the Citigroup Board of Directors are the Executive Committee, Risk Management Committee, Audit Committee, Personnel and Compensation Committee, Ethics and Culture Committee, Operations and Technology Committee and Nomination, Governance and Public Affairs Committee. In addition to the standing committees, the Board creates ad hoc committees from time to time in response to regulatory, legal or other requirements.

CREDIT RISK

Overview

Credit risk is the risk of loss resulting from the decline in credit quality or the failure of a borrower, counterparty, third party or issuer to honor its financial or contractual obligations. Credit risk arises in many of Citigroup's business activities, including:

- consumer, commercial and corporate lending;
- capital markets derivative transactions;
- structured finance; and
- securities financing transactions (repurchase and reverse repurchase agreements, securities loaned and borrowed).

Credit risk also arises from settlement and clearing activities, when Citi transfers an asset in advance of receiving its counter-value or advances funds to settle a transaction on behalf of a client. Concentration risk, within credit risk, is the risk associated with having credit exposure concentrated within a specific client, industry, region or other category.

Credit risk is one of the most significant risks Citi faces as an institution. For additional information, see "Risk Factors—Credit Risk" above. As a result, Citi has a well-established framework in place for managing credit risk across all businesses. This includes a defined risk appetite, credit limits and credit policies, both at the business level as well as at the Company-wide level. Citi's credit risk management also includes processes and policies with respect to problem recognition, including "watch lists," portfolio reviews, stress tests, updated risk ratings and classification triggers.

With respect to Citi's settlement and clearing activities, intraday client usage of lines is monitored against limits, as well as against usage patterns. To the extent a problem develops, Citi typically moves the client to a secured (collateralized) operating model. Generally, Citi's intraday settlement and clearing lines are uncommitted and cancelable at any time.

To manage concentration of risk within credit risk, Citi has in place a correlation framework consisting of industry limits, an idiosyncratic framework consisting of single name concentrations for each business and across Citigroup and a specialized framework consisting of product limits.

Credit exposures are generally reported in notional terms for accrual loans, reflecting the value at which the loans as well as loan and other off-balance sheet commitments are carried on the Consolidated Balance Sheet. Credit exposure arising from capital markets activities is generally expressed as the current mark-to-market, net of margin, reflecting the net value owed to Citi by a given counterparty.

The credit risk associated with these credit exposures is a function of the idiosyncratic creditworthiness of the obligor, as well as the terms and conditions of the specific obligation. Citi assesses the credit risk associated with its credit exposures on a regular basis through its loan loss reserve process (see "Significant Accounting Policies and Significant Estimates—Allowance for Credit Losses" below and Notes 1 and 15 to the Consolidated Financial Statements), as well as through regular stress testing at the company, business, geography and product

levels. These stress-testing processes typically estimate potential incremental credit costs that would occur as a result of either downgrades in the credit quality or defaults of the obligors or counterparties.

For additional information on Citi's credit risk management, see Note 14 to the Consolidated Financial Statements.

Consumer Credit

Citi provides traditional retail banking, including commercial banking, and credit card products in 19 countries and jurisdictions through North America GCB, Latin America GCB and Asia GCB. The retail banking products include consumer mortgages, home equity, personal and commercial loans and lines of credit and similar related products with a focus on lending to prime customers. Citi uses its risk appetite framework to define its lending parameters. In addition, Citi uses proprietary scoring models for new customer approvals.

As stated in "Global Consumer Banking" above, GCB's overall strategy is to leverage Citi's global footprint and be the pre-eminent bank for the affluent and emerging affluent consumers in large urban centers. In credit cards and in certain retail markets (including commercial banking), Citi serves customers in a somewhat broader set of segments and geographies. GCB's commercial banking business primarily focuses on small to mid-size businesses and also serves larger middle market companies in certain regions.

Consumer Credit Portfolio

The following table shows Citi's quarterly end-of-period consumer loans:[1]

In billions of dollars	4Q'17	1Q'18	2Q'18	3Q'18	4Q'18
Retail banking:					
Mortgages	$81.7	$82.1	$80.5	$80.9	$80.6
Commercial banking	36.3	36.8	36.5	37.2	36.3
Personal and other	27.9	28.5	28.1	28.7	28.8
Total retail banking	$145.9	$147.4	$145.1	$146.8	$145.7
Cards:					
Citi-branded cards	$115.7	$110.6	$112.3	$112.8	$116.8
Citi retail services	49.2	46.0	48.6	49.4	52.7
Total cards	$164.9	$156.6	$160.9	$162.2	$169.5
Total GCB	$310.8	$304.0	$306.0	$309.0	$315.2
GCB regional distribution:					
North America	63 %	61 %	63 %	62 %	64 %
Latin America	8	9	8	9	8
Asia[2]	29	30	29	29	28
Total GCB	100 %	100 %	100 %	100 %	100 %
Corporate/Other[3]	$22.9	$21.1	$17.6	$16.5	$15.3
Total consumer loans	$333.7	$325.1	$323.6	$325.5	$330.5

(1) End-of-period loans include interest and fees on credit cards.
(2) Asia includes loans and leases in certain EMEA countries for all periods presented.
(3) Primarily consists of legacy North America consumer mortgages.

For information on changes to Citi's end-of-period consumer loans, see "Liquidity Risk—Loans" below.

Overall Consumer Credit Trends

The following charts show the quarterly trends in delinquencies and net credit losses across both retail banking, including commercial banking, and cards for total GCB and by region.

Global Consumer Banking

North America GCB

North America GCB provides mortgages, home equity loans, personal loans and commercial banking products through Citi's retail banking network and card products through Citi-branded cards and Citi retail services businesses. The retail bank is concentrated in six major metropolitan cities in the United States (for additional information on the U.S. retail bank, see "North America GCB" above).

As of December 31, 2018, 72% of North America GCB consumer loans consisted of Citi-branded and Citi retail services cards, which generally drives the overall credit performance of North America GCB (for additional information on North America GCB's cards portfolios, including delinquency and net credit loss rates, see "Credit Card Trends" below).

As shown in the chart above, the 90+ days past due delinquency rate increased quarter-over-quarter in North America GCB, primarily due to seasonality in both cards portfolios, while the quarter-over-quarter increase in the net credit loss rate was primarily driven by seasonality in Citi retail services. The year-over-year delinquency and net credit loss rates increased, driven by seasoning in both cards portfolios as well as an increase in net flow rates in later delinquency buckets in Citi retail services.

Latin America GCB

Latin America GCB operates in Mexico through Citibanamex, one of Mexico's largest banks, and provides credit cards, consumer mortgages, personal loans and commercial banking products. Latin America GCB serves a more mass market segment in Mexico and focuses on developing multi-product relationships with customers.

As shown in the chart above, the quarter-over-quarter 90+ days past due delinquency rate increased in Latin America GCB, mostly driven by seasonality in the cards portfolio. The quarter-over-quarter net credit loss rate decreased, primarily reflecting the absence of an episodic charge-off in the commercial portfolio in the prior quarter. The year-over-year delinquency and net credit loss rates increased, driven primarily by seasoning of the cards portfolio.

Asia[(1)] GCB

Asia includes GCB activities in certain EMEA countries for all periods presented.

Asia GCB operates in 17 countries in Asia and EMEA and provides credit cards, consumer mortgages, personal loans and commercial banking products.

As shown in the chart above, the 90+ days past due delinquency rate was largely stable in Asia GCB quarter-over-quarter and year-over-year. The net credit loss rate increased quarter-over-quarter and year-over-year, primarily driven by an episodic charge-off in the commercial portfolio in the fourth quarter of 2018. Overall, the strong credit profiles in Asia GCB's target customer segments have resulted in stable portfolio credit quality.

For additional information on cost of credit, loan delinquency and other information for Citi's consumer loan portfolios, see each respective business's results of operations above and Note 14 to the Consolidated Financial Statements.

Credit Card Trends

The following charts show the quarterly trends in delinquencies and net credit losses for total GCB cards, North America Citi-branded cards and Citi retail services portfolios as well as for Citi's Latin America and Asia Citi-branded cards portfolios.

Global Cards

North America Citi-Branded Cards

North America GCB's Citi-branded cards portfolio issues proprietary and co-branded cards. As shown in the chart above, the 90+ days past due delinquency rate in Citi-branded cards increased quarter-over-quarter due to seasonality, and was relatively stable year-over-year. The net credit loss rate was relatively stable quarter-over-quarter, while the net credit loss rate increased year-over-year due to seasoning of the portfolio as well as the impact of higher asset sales in the prior year.

North America Citi Retail Services

Citi retail services partners directly with more than 20 retailers and dealers to offer private label and co-branded consumer and commercial cards. Citi retail services' target market is focused on select industry segments such as home improvement, specialty retail, consumer electronics and fuel. Citi retail services continually evaluates opportunities to add partners within target industries that have strong loyalty, lending or payment programs and growth potential.
As shown in the chart above, Citi retail services' 90+ days past due delinquency and net credit loss rates increased quarter-over-quarter, driven by seasonality as well as the business beginning to incur losses in a recently acquired portfolio. The year-over-year increase in the delinquency rate was primarily driven by seasoning and an increase in net flow rates in later delinquency buckets. On this basis, the net credit loss rate modestly decreased, as the impact of the recently acquired portfolios was partially offset by seasoning as well as an increase in net flow rates in later delinquency buckets.

Latin America Citi-Branded Cards

Latin America GCB issues proprietary and co-branded cards. As shown in the chart above, the quarter-over-quarter 90+ days past due delinquency rate increased, primarily driven by seasonality, while the net credit loss rate decreased also driven by seasonality. Year-over-year the delinquency and net credit loss rates increased primarily due to seasoning of the portfolio.

Asia Citi-Branded Cards[1]

(1) Asia includes loans and leases in certain EMEA countries for all periods presented.

Asia GCB issues proprietary and co-branded cards. As shown in the chart above, the 90+ days past due delinquency rate remained broadly stable quarter-over-quarter and year-over-year, driven by the mature and well-diversified cards portfolios. The net credit loss rate decreased quarter-over-quarter, as the prior quarter reflected a higher rate due to the conversion of an acquired portfolio in Australia, while the net credit loss rate was broadly stable year-over-year.
For additional information on cost of credit, delinquency and other information for Citi's cards portfolios, see each respective business's results of operations above and Note 14 to the Consolidated Financial Statements.

North America Cards FICO Distribution
The following tables show the current FICO score distributions for Citi's North America Citi-branded cards and Citi retail services portfolios based on end-of-period receivables. FICO scores are updated monthly for substantially all of the portfolio and on a quarterly basis for the remaining portfolio.

Citi-Branded

FICO distribution	Dec 31, 2018	Sept. 30, 2018	Dec 31, 2017
> 760	43 %	42 %	42 %
680–760	40	41	41
< 680	17	17	17
Total	100%	100%	100%

Citi Retail Services

FICO distribution	Dec 31, 2018	Sept. 30, 2018	Dec 31, 2017
> 760	25 %	24 %	24 %
680–760	42	43	43
< 680	33	33	33
Total	100%	100%	100%

Both the Citi-branded cards' and Citi retail services' cards FICO distributions remained stable as of year-end 2018.
For additional information on FICO scores, see Note 14 to the Consolidated Financial Statements.

Additional Consumer Credit Details

Consumer Loan Delinquency Amounts and Ratios

	EOP loans[1]	90+ days past due[2]			30–89 days past due[2]		
	December 31,	December 31,			December 31,		
In millions of dollars, except EOP loan amounts in billions	2018	2018	2017	2016	2018	2017	2016
Global Consumer Banking[3][4]							
Total	$ 315.2	$2,619	$2,478	$2,293	$2,902	$2,762	$2,540
Ratio		0.83 %	0.80 %	0.79 %	0.92 %	0.89 %	0.87 %
Retail banking							
Total	$ 145.7	$485	$515	$474	$790	$822	$726
Ratio		0.33 %	0.35 %	0.35 %	0.54 %	0.57 %	0.54 %
North America	56.8	180	199	181	282	306	214
Ratio		0.32 %	0.36 %	0.33 %	0.50 %	0.55 %	0.39 %
Latin America	19.7	127	130	136	201	195	185
Ratio		0.64 %	0.65 %	0.76 %	1.02 %	0.98 %	1.03 %
Asia[5]	69.2	178	186	157	307	321	327
Ratio		0.26 %	0.27 %	0.25 %	0.44 %	0.46 %	0.52 %
Cards							
Total	$ 169.5	$2,134	$1,963	$1,819	$2,112	$1,940	$1,814
Ratio		1.26 %	1.19 %	1.17 %	1.25 %	1.18 %	1.17 %
North America—Citi-branded	91.8	812	768	748	755	698	688
Ratio		0.88 %	0.85 %	0.87 %	0.82 %	0.77 %	0.80 %
North America—Citi retail services	52.7	952	845	761	932	830	777
Ratio		1.81 %	1.72 %	1.61 %	1.77 %	1.69 %	1.64 %
Latin America	5.7	171	151	130	170	153	125
Ratio		3.00 %	2.80 %	2.71 %	2.98 %	2.83 %	2.60 %
Asia[5]	19.3	199	199	180	255	259	224
Ratio		1.03 %	1.01 %	1.03 %	1.32 %	1.31 %	1.28 %
Corporate/Other—Consumer[6]							
Total	$ 15.3	$382	$557	$834	$362	$542	$735
Ratio		2.62 %	2.57 %	2.62 %	2.48 %	2.50 %	2.31 %
International	—	—	43	94	—	40	49
Ratio		— %	2.69 %	3.92 %	— %	2.50 %	2.04 %
North America	15.3	382	514	740	362	502	686
Ratio		2.62 %	2.56 %	2.52 %	2.48 %	2.50 %	2.33 %
Total Citigroup	$ 330.5	$3,001	$3,035	$3,127	$3,264	$3,304	$3,275
Ratio		0.91 %	0.91 %	0.97 %	0.99 %	1.00 %	1.01 %

(1) End-of-period (EOP) loans include interest and fees on credit cards.

(2) The ratios of 90+ days past due and 30–89 days past due are calculated based on EOP loans, net of unearned income.

(3) The 90+ days past due balances for North America—Citi-branded and North America—Citi retail services are generally still accruing interest. Citigroup's policy is generally to accrue interest on credit card loans until 180 days past due, unless notification of bankruptcy filing has been received earlier.

(4) The loans 90+ days past due and 30–89 days past due and related ratios for North America GCB exclude U.S. mortgage loans that are guaranteed by U.S. government-sponsored agencies since the potential loss predominantly resides within the U.S. agencies. The amounts excluded for loans 90+ days past due and (EOP loans) were $201

million ($0.6 billion), $298 million ($0.7 billion) and $327 million ($0.7 billion) at December 31, 2018, 2017 and 2016, respectively. The amounts excluded for loans 30–89 days past due (EOP loans have the same adjustment as above) were $78 million, $88 million and $70 million at December 31, 2018, 2017 and 2016, respectively.

(5) Asia includes delinquencies and loans in certain EMEA countries for all periods presented.

(6) The loans 90+ days and 30–89 days past due and related ratios exclude U.S. mortgage loans that are guaranteed by U.S. government-sponsored agencies since the potential loss predominantly resides within the U.S. agencies. The amounts excluded for loans 90+ days past due and (EOP loans) were $0.3 billion ($.07 billion), $0.6 billion ($1.1 billion) and $0.9 billion ($1.4 billion) at December 31, 2018, 2017 and 2016, respectively. The amounts excluded for loans 30–89 days past due and (EOP loans have the same adjustment as above) were $0.1 billion, $0.1 billion and $0.2 billion at December 31, 2018, 2017 and 2016, respectively.

Consumer Loan Net Credit Losses and Ratios

In millions of dollars, except average loan amounts in billions	Average loans[1] 2018	Net credit losses[2][3] 2018	2017	2016
Global Consumer Banking				
Total	$ 306.2	$6,920	$6,562	$5,610
Ratio		2.26 %	2.21 %	2.01 %
Retail banking				
Total	$ 146.0	$949	$1,023	$1,007
Ratio		0.65 %	0.72 %	0.72 %
North America	56.0	$138	$194	$205
Ratio		0.25 %	0.35 %	0.38 %
Latin America	20.3	$567	$584	$541
Ratio		2.79 %	2.92 %	2.85 %
Asia[4]	69.7	$244	$245	$261
Ratio		0.35 %	0.37 %	0.39 %
Cards				
Total	$ 160.2	$5,971	$5,539	$4,603
Ratio		3.72 %	3.60 %	3.30 %
North America—Citi-branded	87.5	$2,602	$2,447	$1,909
Ratio		2.97 %	2.90 %	2.61 %
North America—Retail services	48.3	$2,357	$2,155	$1,805
Ratio		4.88 %	4.73 %	4.12 %
Latin America	5.5	$586	$533	$499
Ratio		10.65 %	10.06 %	9.78 %
Asia[4]	18.9	$426	$404	$390
Ratio		2.25 %	2.17 %	2.24 %
Corporate/Other—Consumer[3]				
Total	$ 18.7	$24	$156	$438
Ratio		0.14 %	0.57 %	1.06 %
International	0.7	$42	$82	$269
Ratio		6.00 %	4.32 %	5.17 %
North America	18.0	$(18)	$74	$169
Ratio		NM	0.29 %	0.47 %
Other[5]	—	$—	$(21)	$—
Total Citigroup	$ 324.9	$6,944	$6,697	$6,048
Ratio		2.14 %	2.07 %	1.88 %

(1) Average loans include interest and fees on credit cards.

(2) The ratios of net credit losses are calculated based on average loans, net of unearned income.

(3) As a result of Citigroup's entry into agreements in 2016 to sell its Argentina and Brazil consumer banking businesses, these businesses were classified as HFS at the end of the fourth quarter of 2016. Loans HFS are excluded from this table as they are recorded in Other assets. In addition, as a result of HFS accounting treatment, approximately $128 million and $42 million of net credit losses (NCLs) were recorded as a reduction in revenue (Other revenue) during 2017 and 2016, respectively. Accordingly, these NCLs are not included in this table. The sales of the Argentina and Brazil consumer banking businesses were completed in 2017.

(4) Asia includes average loans and NCLs in certain EMEA countries for all periods presented.

(5) 2017 NCLs reflected a recovery related to legacy assets.

NM Not meaningful

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Loan Maturities and Fixed/Variable Pricing
U.S. Consumer Mortgages

In millions of dollars at year-end 2018	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total
U.S. consumer mortgage loan portfolio				
Residential first mortgages	$ 74	$ 509	$ 47,897	$ 48,480
Home equity loans	36	584	11,027	11,647
Total	$ 110	$ 1,093	$ 58,924	$ 60,127
Fixed/variable pricing of U.S. consumer mortgage loans with maturities due after one year				
Loans at fixed interest rates		$ 934	$ 37,503	
Loans at floating or adjustable interest rates		159	21,421	
Total		$ 1,093	$ 58,924	

Corporate Credit

Consistent with its overall strategy, Citi's corporate clients are typically large, multinational corporations that value the depth and breadth of Citi's global network. Citi aims to establish relationships with these clients that encompass multiple products, consistent with client needs, including cash management and trade services, foreign exchange, lending, capital markets and M&A advisory.

Corporate Credit Portfolio

The following table presents Citi's corporate credit portfolio within ICG (excluding private bank), before consideration of collateral or hedges, by remaining tenor for the periods indicated:

	At December 31, 2018				At September 30, 2018				At December 31, 2017			
In billions of dollars	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure
Direct outstandings (on-balance sheet)[1]	$128	$ 110	$ 20	$ 258	$131	$ 103	$ 20	$ 254	$127	$ 96	$ 22	$ 245
Unfunded lending commitments (off-balance sheet)[2]	106	245	19	370	115	253	25	393	111	222	20	353
Total exposure	$234	$ 355	$ 39	$ 628	$246	$ 356	$ 45	$ 647	$238	$ 318	$ 42	$ 598

(1) Includes drawn loans, overdrafts, bankers' acceptances and leases.
(2) Includes unused commitments to lend, letters of credit and financial guarantees.

Portfolio Mix—Geography, Counterparty and Industry

Citi's corporate credit portfolio is diverse across geography and counterparty. The following table shows the percentage of this portfolio by region based on Citi's internal management geography:

	December 31, 2018		September 30, 2018		December 31, 2017	
North America	55	%	55	%	54	%
EMEA	27		27		27	
Asia	11		11		12	
Latin America	7		7		7	
Total	100	%	100	%	100	%

The maintenance of accurate and consistent risk ratings across the corporate credit portfolio facilitates the comparison of credit exposure across all lines of business, geographic regions and products. Counterparty risk ratings reflect an estimated probability of default for a counterparty and are derived primarily through the use of validated statistical models, scorecard models and external agency ratings (under defined circumstances), in combination with consideration of factors specific to the obligor or market, such as management experience, competitive position, regulatory environment and commodity prices. Facility risk ratings are assigned that reflect the probability of default of the obligor and factors that affect the loss-given-default of the facility, such as support or collateral. Internal obligor ratings that generally correspond to

BBB and above are considered investment grade, while those below are considered non-investment grade.
Citigroup has also incorporated environmental factors such as climate risk assessment and reporting criteria for certain obligors, as necessary. Factors evaluated include consideration of climate risk to an obligor's business and physical

assets and, when relevant, consideration of cost-effective options to reduce greenhouse gas emissions.

The following table presents the corporate credit portfolio by facility risk rating as a percentage of the total corporate credit portfolio:

	Total exposure					
	December 31, 2018		September 30, 2018		December 31, 2017	
AAA/AA/A	49	%	48	%	49	%
BBB	34		34		34	
BB/B	16		17		16	
CCC or below	1		1		1	
Total	100	%	100	%	100	%

Note: Total exposure includes direct outstandings and unfunded lending commitments.

Citi's corporate credit portfolio is also diversified by industry. The following table shows the allocation of Citi's total corporate credit portfolio by industry:

	Total exposure					
	December 31, 2018		September 30, 2018		December 31, 2017	
Transportation and industrial	21	%	21	%	22	%
Consumer retail and health	16		16		16	
Technology, media and telecom	13		14		12	
Power, chemicals, metals and mining	10		11		10	
Banks/broker-dealers/finance companies	8		8		8	
Real estate	8		8		8	
Energy and commodities	8		8		8	
Public sector	5		5		5	
Insurance and special purpose entities	4		4		5	
Hedge funds	4		4		4	
Other industries	3		1		2	
Total	100	%	100	%	100	%

Credit Risk Mitigation

As part of its overall risk management activities, Citigroup uses credit derivatives and other risk mitigants to hedge portions of the credit risk in its corporate credit portfolio, in addition to outright asset sales. The results of the mark-to-market and any realized gains or losses on credit derivatives are reflected primarily in Other revenue in the Consolidated Statement of Income.

At December 31, 2018, September 30, 2018 and December 31, 2017, $30.8 billion, $26.9 billion and $16.3 billion, respectively, of the corporate credit portfolio was economically hedged. Citigroup's expected loss model used in the calculation of its loan loss reserve does not include the favorable impact of credit derivatives and other mitigants that are marked to market. In addition, the reported amounts of direct outstandings and unfunded lending commitments in the tables above do not reflect the impact of these hedging transactions. The credit protection was economically hedging underlying corporate credit portfolio exposures with the following risk rating distribution:

Rating of Hedged Exposure

	December 31, 2018		September 30, 2018		December 31, 2017	
AAA/AA/A	35	%	34	%	23	%
BBB	50		47		43	
BB/B	14		17		31	
CCC or below	1		2		3	
Total	100	%	100	%	100	%

The credit protection was economically hedging underlying corporate credit portfolio exposures with the following industry distribution:

Industry of Hedged Exposure

	December 31, 2018		September 30, 2018		December 31, 2017	
Transportation and industrial	23	%	25	%	27	%
Technology, media and telecom	17		15		12	
Consumer retail and health	16		14		10	
Power, chemicals, metals and mining	15		14		14	
Energy and commodities	11		11		15	
Insurance and special purpose entities	6		4		2	
Banks/broker-dealers/finance companies	4		5		6	
Public sector	3		7		12	
Real estate	4		4		1	
Other industries	1		1		1	
Total	100	%	100	%	100	%

Loan Maturities and Fixed/Variable Pricing of Corporate Loans

In millions of dollars at December 31, 2018	Due within 1 year	Over 1 year but within 5 years	Over 5 years	Total
Corporate loans				
In U.S. offices				
Commercial and industrial loans	$19,935	$20,599	$11,529	$52,063
Financial institutions	18,550	19,169	10,728	48,447
Mortgage and real estate	19,193	19,832	11,099	50,124
Installment, revolving credit and other	12,730	13,155	7,362	33,247
Lease financing	546	566	317	1,429
In offices outside the U.S.	109,497	51,280	8,444	169,221
Total corporate loans	$180,451	$124,601	$49,479	$354,531
Fixed/variable pricing of corporate loans with maturities due after one year[(1)]				
Loans at fixed interest rates		$23,779	$16,595	
Loans at floating or adjustable interest rates		100,822	32,884	
Total		$124,601	$49,479	

(1) Based on contractual terms. Repricing characteristics may effectively be modified from time to time using derivative contracts. See Note 22 to the Consolidated Financial Statements.

Additional Consumer and Corporate Credit Details

Loans Outstanding

	December 31,				
In millions of dollars	2018	2017	2016	2015	2014
Consumer loans					
In U.S. offices					
Mortgage and real estate[1]	$60,127	$65,467	$72,957	$80,281	$96,533
Installment, revolving credit and other	3,398	3,398	3,395	3,480	14,450
Cards	143,788	139,006	132,654	112,800	112,982
Commercial and industrial	8,256	7,840	7,159	6,407	5,895
Total	$215,569	$215,711	$216,165	$202,968	$229,860
In offices outside the U.S.					
Mortgage and real estate[1]	$43,379	$44,081	$42,803	$47,062	$54,462
Installment, revolving credit and other	27,609	26,556	24,887	29,480	31,128
Cards	25,400	26,257	23,783	27,342	32,032
Commercial and industrial	17,773	20,238	16,568	17,410	18,294
Lease financing	49	76	81	362	546
Total	$114,210	$117,208	$108,122	$121,656	$136,462
Total consumer loans	$329,779	$332,919	$324,287	$324,624	$366,322
Unearned income[2]	708	737	776	830	(679)
Consumer loans, net of unearned income	$330,487	$333,656	$325,063	$325,454	$365,643
Corporate loans					
In U.S. offices					
Commercial and industrial	$52,063	$51,319	$49,586	$46,011	$39,542
Financial institutions	48,447	39,128	35,517	36,425	36,324
Mortgage and real estate[1]	50,124	44,683	38,691	32,623	27,959
Installment, revolving credit and other	33,247	33,181	34,501	33,423	29,246
Lease financing	1,429	1,470	1,518	1,780	1,758
Total	$185,310	$169,781	$159,813	$150,262	$134,829
In offices outside the U.S.					
Commercial and industrial	$94,701	$93,750	$81,882	$82,689	$83,506
Financial institutions	36,837	35,273	26,886	28,704	33,269
Mortgage and real estate[1]	7,376	7,309	5,363	5,106	6,031
Installment, revolving credit and other	25,684	22,638	19,965	20,853	19,259
Lease financing	103	190	251	303	419
Governments and official institutions	4,520	5,200	5,850	4,911	2,236
Total	$169,221	$164,360	$140,197	$142,566	$144,720
Total corporate loans	$354,531	$334,141	$300,010	$292,828	$279,549
Unearned income[3]	(822)	(763)	(704)	(665)	(557)
Corporate loans, net of unearned income	$353,709	$333,378	$299,306	$292,163	$278,992
Total loans—net of unearned income	$684,196	$667,034	$624,369	$617,617	$644,635
Allowance for loan losses—on drawn exposures	(12,315)	(12,355)	(12,060)	(12,626)	(15,994)
Total loans—net of unearned income and allowance for credit losses	$671,881	$654,679	$612,309	$604,991	$628,641
Allowance for loan losses as a percentage of total loans—net of unearned income[4]	1.81%	1.86%	1.94%	2.06%	2.50%

Allowance for consumer loan losses as a percentage of total consumer loans—net of unearned income[4]	3.01	%2.96	%2.88	%3.02	%3.71	%
Allowance for corporate loan losses as a percentage of total corporate loans—net of unearned income[4]	0.67	%0.76	%0.91	%0.97	%0.90	%

(1) Loans secured primarily by real estate.

(2) Unearned income on consumer loans primarily represents unamortized origination fees, costs, premiums and discounts. Prior to December 31, 2015, these items were more than offset by prepaid interest on loans outstanding issued by OneMain Financial. The sale of OneMain Financial was completed in 2015.

(3) Unearned income on corporate loans primarily represents interest received in advance, but not yet earned on loans originated on a discount basis.

(4) All periods exclude loans that are carried at fair value.

Details of Credit Loss Experience In millions of dollars	2018	2017	2016	2015	2014
Allowance for loan losses at beginning of period	$12,355	$12,060	$12,626	$15,994	$19,648
Provision for loan losses					
Consumer	$7,288	$7,363	$6,321	$6,228	$6,699
Corporate	66	140	428	880	129
Total	$7,354	$7,503	$6,749	$7,108	$6,828
Gross credit losses					
Consumer					
In U.S. offices	$5,989	$5,736	$4,970	$5,500	$6,780
In offices outside the U.S.	2,405	2,447	2,672	3,192	3,874
Corporate					
Commercial and industrial, and other					
In U.S. offices	103	151	274	112	66
In offices outside the U.S.	154	331	256	182	310
Loans to financial institutions					
In U.S. offices	3	3	5	—	2
In offices outside the U.S.	7	1	5	4	13
Mortgage and real estate					
In U.S offices	2	2	34	8	8
In offices outside the U.S.	2	2	6	43	55
Total	$8,665	$8,673	$8,222	$9,041	$11,108
Credit recoveries[1]					
Consumer					
In U.S. offices	$922	$903	$980	$975	$1,122
In offices outside the U.S.	528	583	614	659	853
Corporate					
Commercial and industrial, and other					
In U.S. offices	37	20	23	22	64
In offices outside the U.S.	52	86	41	67	84
Loans to financial institutions					
In U.S. offices	—	1	1	7	1
In offices outside the U.S.	3	1	1	2	11
Mortgage and real estate					
In U.S. offices	6	2	1	7	—
In offices outside the U.S.	4	1	—	—	—
Total	$1,552	$1,597	$1,661	$1,739	$2,135
Net credit losses					
In U.S. offices	$5,132	$4,966	$4,278	$4,609	$5,669
In offices outside the U.S.	1,981	2,110	2,283	2,693	3,304
Total	$7,113	$7,076	$6,561	$7,302	$8,973
Other—net[2][3][4][5][6][7][8]	$(281)	$(132)	$(754)	$(3,174)	$(1,509)
Allowance for loan losses at end of period	$12,315	$12,355	$12,060	$12,626	$15,994
Allowance for loan losses as a percentage of total loans[9]	1.81%	1.86%	1.94%	2.06%	2.50%
Allowance for unfunded lending commitments[8][10]	$1,367	$1,258	$1,418	$1,402	$1,063
Total allowance for loan losses and unfunded lending commitments	$13,682	$13,613	$13,478	$14,028	$17,057

Net consumer credit losses	$6,944	$6,697	$6,048	$7,058	$8,679
As a percentage of average consumer loans	2.14 %	2.07 %	1.88 %	2.08 %	2.31 %
Net corporate credit losses	$169	$379	$513	$244	$294

As a percentage of average corporate loans	0.05	%	0.12	%	0.17	%
Allowance by type[11]						
Consumer	$9,950		$9,869		$9,358	
Corporate	2,365		2,486		2,702	
Total Citigroup	$12,315		$12,355		$12,060	

As a percentage of average corporate loans	0.08	%	0.10	%		
Allowance by type[11]						
Consumer	$9,835		$13,547			
Corporate	2,791		2,447			
Total Citigroup	$12,626		$15,994			

(1) Recoveries have been reduced by certain collection costs that are incurred only if collection efforts are successful.

(2) Includes all adjustments to the allowance for credit losses, such as changes in the allowance from acquisitions, dispositions, securitizations, FX translation, purchase accounting adjustments, etc.

(3) 2018 includes reductions of approximately $201 million related to the sale or transfer to HFS of various loan portfolios, which includes approximately $91 million related to the transfer of various real estate loan portfolios to HFS. Additionally, 2018 includes a reduction of approximately $60 million related to FX translation.

(4) 2017 includes reductions of approximately $261 million related to the sale or transfer to HFS of various loan portfolios, which includes approximately $106 million related to the transfer of various real estate loan portfolios to HFS. Additionally, 2017 includes an increase of approximately $115 million related to FX translation.

(5) 2016 includes reductions of approximately $574 million related to the sale or transfer to HFS of various loan portfolios, which includes approximately $106 million related to the transfer of various real estate loan portfolios to HFS. Additionally, 2016 includes a reduction of approximately $199 million related to FX translation.

(6) 2015 includes reductions of approximately $2.4 billion related to the sale or transfer to HFS of various loan portfolios, which includes approximately $1.5 billion related to the transfer of various real estate loan portfolios to HFS. Additionally, 2015 includes a reduction of approximately $474 million related to FX translation.

(7) 2014 includes reductions of approximately $1.1 billion related to the sale or transfer to HFS of various loan portfolios, which includes approximately $411 million related to the transfer of various real estate loan portfolios to HFS, approximately $204 million related to the transfer to HFS of a business in Greece, approximately $177 million related to the transfer to HFS of a business in Spain, approximately $29 million related to the transfer to HFS of a business in Honduras, and approximately $108 million related to the transfer to HFS of various EMEA loan portfolios. Additionally, 2014 includes a reduction of approximately $463 million related to FX translation.

(8) 2015 includes a reclassification of $271 million of Allowance for loan losses to allowance for unfunded lending commitments, included in the Other line item. This reclassification reflects the re-attribution of $271 million in the allowance for credit losses between the funded and unfunded portions of the corporate credit portfolios and does not reflect a change in the underlying credit performance of these portfolios.

(9) December 31, 2018, December 31, 2017, December 31, 2016, December 31, 2015 and December 31, 2014 exclude $3.2 billion, $4.4 billion, $3.5 billion, $5.0 billion and $5.9 billion, respectively, of loans which are carried at fair value.

(10) Represents additional credit reserves recorded as Other liabilities on the Consolidated Balance Sheet.

(11) Allowance for loan losses represents management’s best estimate of probable losses inherent in the portfolio, as well as probable losses related to large individually evaluated impaired loans and troubled debt restructurings. See “Significant Accounting Policies and Significant Estimates” and Note 1 to the Consolidated Financial Statements below. Attribution of the allowance is made for analytical purposes only and the entire allowance is available to absorb probable credit losses inherent in the overall portfolio.

Allowance for Loan Losses

The following tables detail information on Citi's allowance for loan losses, loans and coverage ratios:

In billions of dollars	December 31, 2018 Allowance for loan losses	Loans, net of unearned income	Allowance as a percentage of loans[1]	
North America cards[2]	$6.5	$ 144.6	4.5	%
North America mortgages[3]	0.4	58.9	0.7	
North America other	0.3	13.2	2.3	
International cards	1.4	24.9	5.6	
International other[4]	1.3	88.9	1.5	
Total consumer	$9.9	$ 330.5	3.0	%
Total corporate	2.4	353.7	0.7	
Total Citigroup	$12.3	$ 684.2	1.8	%

(1) Allowance as a percentage of loans excludes loans that are carried at fair value.

(2) Includes both Citi-branded cards and Citi retail services. The $6.5 billion of loan loss reserves represented approximately 16 months of coincident net credit loss coverage.

(3) Of the $0.4 billion, nearly all of it was allocated to North America mortgages in Corporate/Other, including $0.1 billion and $0.3 billion determined in accordance with ASC 450-20 and ASC 310-10-35 (troubled debt restructurings), respectively. Of the $58.9 billion in loans, approximately $56.3 billion and $2.5 billion of the loans were evaluated in accordance with ASC 450-20 and ASC 310-10-35 (troubled debt restructurings), respectively. For additional information, see Note 15 to the Consolidated Financial Statements.

(4) Includes mortgages and other retail loans.

In billions of dollars	December 31, 2017 Allowance for loan losses	Loans, net of unearned income	Allowance as a percentage of loans[1]	
North America cards[2]	$6.1	$ 139.7	4.4	%
North America mortgages[3]	0.7	64.2	1.1	
North America other	0.3	13.0	2.3	
International cards	1.3	25.7	5.1	
International other[4]	1.5	91.1	1.6	
Total consumer	$9.9	$ 333.7	3.0	%
Total corporate	2.5	333.3	0.8	
Total Citigroup	$12.4	$ 667.0	1.9	%

(1) Allowance as a percentage of loans excludes loans that are carried at fair value.

(2) Includes both Citi-branded cards and Citi retail services. The $6.1 billion of loan loss reserves represented approximately 16 months of coincident net credit loss coverage.

(3) Of the $0.7 billion, approximately $0.6 billion was allocated to North America mortgages in Corporate/Other. Of the $0.7 billion, approximately $0.2 billion and $0.5 billion were determined in accordance with ASC 450-20 and ASC 310-10-35 (troubled debt restructurings), respectively. Of the $64.2 billion in loans, approximately $60.4 billion and $3.7 billion of the loans were evaluated in accordance with ASC 450-20 and ASC 310-10-35 (troubled debt restructurings), respectively. For additional information, see Note 15 to the Consolidated Financial Statements.

(4) Includes mortgages and other retail loans.

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Non-Accrual Loans and Assets and Renegotiated Loans

There is a certain amount of overlap among non-accrual loans and assets and renegotiated loans. The following summary provides a general description of each category.

Non-Accrual Loans and Assets:

- Corporate and consumer (including commercial banking) non-accrual status is based on the determination that payment of interest or principal is doubtful.
- A corporate loan may be classified as non-accrual and still be performing under the terms of the loan structure. Non-accrual loans may still be current on interest payments. Approximately 55%, 57% and 74% of Citi's corporate non-accrual loans were performing at December 31, 2018, September 30, 2018 and December 31, 2017, respectively.
- Consumer non-accrual status is generally based on aging, i.e., the borrower has fallen behind on payments. Consumer mortgage loans, other than Federal Housing Administration (FHA) insured loans, are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy. In addition, home equity loans are classified as non-accrual if the related residential first mortgage loan is 90 days or more past due.
- North America Citi-branded cards and Citi retail services are not included because, under industry standards, credit card loans accrue interest until such loans are charged off, which typically occurs at 180 days of contractual delinquency.

Renegotiated Loans:

- Includes both corporate and consumer loans whose terms have been modified in a troubled debt restructuring (TDR).
- Includes both accrual and non-accrual TDRs.

Non-Accrual Loans

The table below summarizes Citigroup's non-accrual loans as of the periods indicated. Non-accrual loans may still be current on interest payments. In situations where Citi reasonably expects that only a portion of the principal owed

will ultimately be collected, all payments received are reflected as a reduction of principal and not as interest income. For all other non-accrual loans, cash interest receipts are generally recorded as revenue.

	December 31,				
In millions of dollars	2018	2017	2016	2015	2014
Corporate non-accrual loans[1][2]					
North America	$483	$784	$984	$818	$321
EMEA	375	849	904	347	285
Latin America	230	280	379	303	417
Asia	223	29	154	128	179
Total corporate non-accrual loans	$1,311	$1,942	$2,421	$1,596	$1,202
Consumer non-accrual loans[1][3]					
North America	$1,241	$1,650	$2,160	$2,515	$4,411
Latin America	715	756	711	874	1,188
Asia[4]	270	284	287	269	306
Total consumer non-accrual loans	$2,226	$2,690	$3,158	$3,658	$5,905
Total non-accrual loans	$3,537	$4,632	$5,579	$5,254	$7,107

(1) Excludes purchased distressed loans, as they are generally accreting interest. The carrying value of these loans was $128 million at December 31, 2018, $167 million at December 31, 2017, $187 million at December 31, 2016, $250 million at December 31, 2015 and $421 million at December 31, 2014.

(2) The 2016 increase in corporate non-accrual loans was primarily related to Citi's North America and EMEA energy and energy-related corporate credit exposure.

(3) The 2015 decline in consumer non-accrual loans includes the impact related to the transfer of approximately $8 billion of mortgage loans to Loans HFS (included within Other assets).

(4) Asia includes balances in certain EMEA countries for all periods presented.

The changes in Citigroup's non-accrual loans were as follows:

	Year ended December 31, 2018			Year ended December 31, 2017		
In millions of dollars	Corporate	Consumer	Total	Corporate	Consumer	Total
Non-accrual loans at beginning of period	$1,942	$ 2,690	$4,632	$2,421	$ 3,158	$5,579
Additions	2,108	3,148	5,256	1,347	3,508	4,855
Sales and transfers to HFS	(119)	(268)	(387)	(134)	(379)	(513)
Returned to performing	(127)	(629)	(756)	(47)	(634)	(681)
Paydowns/settlements	(2,282)	(1,052)	(3,334)	(1,400)	(1,163)	(2,563)
Charge-offs	(196)	(1,634)	(1,830)	(144)	(1,869)	(2,013)
Other	(15)	(29)	(44)	(101)	69	(32)
Ending balance	$1,311	$ 2,226	$3,537	$1,942	$ 2,690	$4,632

Non-Accrual Assets

The table below summarizes Citigroup's other real estate owned (OREO) assets as of the periods indicated. This represents the carrying value of all real estate property acquired by foreclosure or other legal proceedings when Citi has taken possession of the collateral:

	December 31,				
In millions of dollars	2018	2017	2016	2015	2014
OREO[1]					
North America	$64	$89	$161	$166	$196
EMEA	1	2	—	1	7
Latin America	12	35	18	38	47
Asia	22	18	7	4	10
Total OREO	$99	$144	$186	$209	$260
Non-accrual assets					
Corporate non-accrual loans	$1,311	$1,942	$2,421	$1,596	$1,202
Consumer non-accrual loans[2]	2,226	2,690	3,158	3,658	5,905
Non-accrual loans (NAL)	$3,537	$4,632	$5,579	$5,254	$7,107
OREO	$99	$144	$186	$209	$260
Non-accrual assets (NAA)	$3,636	$4,776	$5,765	$5,463	$7,367
NAL as a percentage of total loans	0.52 %	0.69 %	0.89 %	0.85 %	1.10 %
NAA as a percentage of total assets	0.19	0.26	0.32	0.32	0.40
Allowance for loan losses as a percentage of NAL[3]	348	267	216	240	225

(1) Reflects a decrease of $130 million related to the adoption of ASU 2014-14 in 2014, which requires certain government guaranteed mortgage loans to be recognized as separate other receivables upon foreclosure. Prior periods have not been restated.

(2) The 2015 decline in consumer non-accrual loans includes the impact related to the transfer of approximately $8 billion of mortgage loans to Loans HFS (included within Other assets).

(3) The allowance for loan losses includes the allowance for Citi's credit card portfolios and purchased distressed loans, while the non-accrual loans exclude credit card balances (with the exception of certain international portfolios) and purchased distressed loans as these continue to accrue interest until charge-off.

Renegotiated Loans

The following table presents Citi's loans modified in TDRs:

In millions of dollars	Dec. 31, 2018	Dec. 31, 2017
Corporate renegotiated loans[1]		
In U.S. offices		
Commercial and industrial[2]	$188	$225
Mortgage and real estate	111	90
Financial institutions	16	33
Other	2	45
Total	$317	$393
In offices outside the U.S.		
Commercial and industrial[2]	$226	$392
Mortgage and real estate	12	11
Financial institutions	9	15
Other	—	7
Total	$247	$425
Total corporate renegotiated loans	$564	$818
Consumer renegotiated loans[3][4][5]		
In U.S. offices		
Mortgage and real estate[6]	$2,520	$3,709
Cards	1,338	1,246
Installment and other	86	169
Total	$3,944	$5,124
In offices outside the U.S.		
Mortgage and real estate	$311	$345
Cards	480	541
Installment and other	415	427
Total	$1,206	$1,313
Total consumer renegotiated loans	$5,150	$6,437

(1) Includes $466 million and $715 million of non-accrual loans included in the non-accrual loans table above at December 31, 2018 and 2017, respectively. The remaining loans are accruing interest.

(2) In addition to modifications reflected as TDRs at December 31, 2018 and 2017, Citi also modified $0 million and $51 million in offices in the U.S., and $2 million and $95 million in offices outside of the U.S., respectively, of commercial loans risk rated "Substandard Non-Performing" or worse (asset category defined by banking regulators). These modifications were not considered TDRs because the modifications did not involve a concession.

(3) Includes $1,015 million and $1,376 million of non-accrual loans included in the non-accrual loans table above at December 31, 2018 and 2017, respectively. The remaining loans are accruing interest.

(4) Includes $17 million and $26 million of commercial real estate loans at December 31, 2018 and 2017, respectively.

(5) Includes $101 million and $165 million of other commercial loans at December 31, 2018 and 2017, respectively.

(6) Reduction in 2018 includes $919 million related to TDRs sold or transferred to HFS.

Forgone Interest Revenue on Loans[1]

In millions of dollars	In U.S. offices	In non-U.S. offices	2018 total
Interest revenue that would have been accrued at original contractual rates[2]	$ 683	$ 458	$1,141
Amount recognized as interest revenue[2]	217	128	345
Forgone interest revenue	$ 466	$ 330	$796

(1) Relates to corporate non-accrual loans, renegotiated loans and consumer loans on which accrual of interest has been suspended.

(2) Interest revenue in offices outside the U.S. may reflect prevailing local interest rates, including the effects of inflation and monetary correction in certain countries.

LIQUIDITY RISK

Overview

Adequate and diverse sources of funding and liquidity are essential to Citi's businesses. Funding and liquidity risks arise from several factors, many of which are mostly or entirely outside Citi's control, such as disruptions in the financial markets, changes in key funding sources, credit spreads, changes in Citi's credit ratings and geopolitical and macroeconomic conditions. For additional information, see "Risk Factors" above.

Citi's funding and liquidity objectives are aimed at (i) funding its existing asset base, (ii) growing its core businesses, (iii) maintaining sufficient liquidity, structured appropriately, so that Citi can operate under a variety of adverse circumstances, including potential Company-specific and/or market liquidity events in varying durations and severity, and (iv) satisfying regulatory requirements, including, among other things, those related to resolution planning (for additional information, see "Resolution Plan" and "Total Loss-Absorbing Capacity (TLAC)" below). Citigroup's primary liquidity objectives are established by entity, and in aggregate, across two major categories:

- Citibank (including Citibank Europe plc, Citibank Singapore Ltd. and Citibank (Hong Kong) Ltd.); and
- the non-bank and other, which includes the parent holding company (Citigroup), Citi's primary intermediate holding company (Citicorp LLC), Citi's broker-dealer subsidiaries (including Citigroup Global Markets Inc., Citigroup Global Markets Ltd. and Citigroup Global Markets Japan Inc.) and other bank and non-bank subsidiaries that are consolidated into Citigroup (including Citibanamex).

At an aggregate level, Citigroup's goal is to maintain sufficient funding in amount and tenor to fully fund customer assets and to provide an appropriate amount of cash and high-quality liquid assets (as discussed below), even in times of stress. The liquidity risk management framework provides that in addition to the aggregate requirements, certain entities be self-sufficient or net providers of liquidity, including in conditions established under their designated stress tests.

Citi's primary sources of funding include (i) deposits via Citi's bank subsidiaries, which are Citi's most stable and lowest cost source of long-term funding, (ii) long-term debt (primarily senior and subordinated debt) primarily issued at the parent and certain bank subsidiaries, and (iii) stockholders' equity. These sources may be supplemented by short-term borrowings, primarily in the form of secured funding transactions.

As referenced above, Citi works to ensure that the tenor of these funding sources is sufficiently long in relation to the tenor of its asset base. The goal of Citi's asset/liability management is to ensure that there is excess liquidity and tenor in the liability structure relative to the liquidity profile of the assets. This reduces the risk that liabilities will become due before asset maturities or monetizations through sale. This excess liquidity is held primarily in the form of high-quality liquid assets (HQLA), as set forth in the table below.

Citi's Treasurer has overall responsibility for management of Citi's HQLA. Citi's liquidity is managed via a centralized treasury model by Corporate Treasury, in conjunction with regional and in-country treasurers. Pursuant to this approach, Citi's HQLA are managed with emphasis on asset-liability management and entity-level liquidity adequacy throughout Citi.

Citi's Chief Risk Officer is responsible for the overall liquidity risk profile of Citi. The Chief Risk Officer and Citi's CFO co-chair Citi's Asset Liability Management Committee (ALCO), which includes Citi's Treasurer and other senior executives. ALCO sets the strategy of the liquidity portfolio and monitors its performance. Significant changes to portfolio asset allocations need to be approved by ALCO.

Liquidity Monitoring and Measurement

Stress Testing

Liquidity stress testing is performed for each of Citi's major entities, operating subsidiaries and/or countries. Stress testing and scenario analyses are intended to quantify the potential impact of an adverse liquidity event on the balance sheet and liquidity position, and to identify viable funding alternatives that can be utilized. These scenarios include assumptions about significant changes in key funding sources, market triggers (such as credit ratings), potential uses

of funding and geopolitical and macroeconomic conditions. These conditions include expected and stressed market conditions as well as Company-specific events.

Liquidity stress tests are performed to ascertain potential mismatches between liquidity sources and uses over a variety of time horizons and over different stressed conditions. Liquidity limits are set accordingly. To monitor the liquidity of an entity, these stress tests and potential mismatches are calculated with varying frequencies, with several tests performed daily.

Given the range of potential stresses, Citi maintains contingency funding plans on a consolidated basis and for individual entities. These plans specify a wide range of readily available actions for a variety of adverse market conditions or idiosyncratic stresses.

High-Quality Liquid Assets (HQLA)

In billions of dollars	Citibank			Non-bank and Other			Total		
	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Available cash	$97.1	$105.1	$94.3	$27.6	$35.1	$30.9	$124.7	$140.2	$125.2
U.S. sovereign	103.2	102.2	113.2	24.0	29.7	27.9	127.2	131.9	141.1
U.S. agency/agency MBS	60.0	56.4	80.8	5.8	6.5	0.5	65.8	62.9	81.3
Foreign government debt[(1)]	76.8	74.9	80.5	6.3	9.6	16.4	83.2	84.5	96.9
Other investment grade	1.5	0.2	0.7	1.3	1.1	1.2	2.8	1.3	1.9
Total HQLA (AVG)	$338.6	$338.8	$369.5	$65.1	$82.0	$76.9	$403.7	$420.8	$446.4

Note: The amounts set forth in the table above are presented on an average basis. For securities, the amounts represent the liquidity value that potentially could be realized and, therefore, exclude any securities that are encumbered and incorporate any haircuts that would be required for securities financing transactions.

(1) Foreign government debt includes securities issued or guaranteed by foreign sovereigns, agencies and multilateral development banks. Foreign government debt securities are held largely to support local liquidity requirements and Citi's local franchises and principally include government bonds from Hong Kong, Singapore, Korea, Taiwan, India, Mexico and Brazil.

The table above includes average amounts of HQLA held at Citigroup's operating entities that are eligible for inclusion in the calculation of Citigroup's consolidated LCR, pursuant to the U.S. LCR rules. These amounts include the HQLA needed to meet the minimum requirements at these entities and any amounts in excess of these minimums that are assumed to be transferable to Citigroup. While available liquidity resources at operating entities remained largely unchanged, the amount of HQLA included in the table above declined both year-over-year and quarter-over-quarter as less HQLA in the operating entities was eligible for inclusion in the consolidated metric. Quarter-over-quarter, the decline in HQLA was also driven by balance sheet optimization as Citi deployed cash to fund loan growth and reduce debt levels.

Citi's HQLA does not include Citi's available borrowing capacity from the Federal Home Loan Banks (FHLBs) of which Citi is a member, which was approximately $29 billion as of December 31, 2018 (unchanged from September 30, 2018 and compared to $10 billion as of December 31, 2017) and maintained by eligible collateral pledged to such banks. The HQLA also does not include Citi's borrowing capacity at the U.S. Federal Reserve Bank discount window or other central banks, which would be in addition to the resources noted above.

In general, Citi's liquidity is fungible across legal entities within its bank group. Citi's bank subsidiaries, including Citibank, can lend to the Citi parent and broker-dealer entities in accordance with Section 23A of the Federal Reserve Act. As of December 31, 2018, the capacity available for lending to these entities under Section 23A was approximately $15 billion, unchanged from both September 30, 2018 and December 31, 2017, subject to certain eligible non-cash collateral requirements.

Short-Term Liquidity Measurement: Liquidity Coverage Ratio (LCR)

In addition to internal liquidity stress metrics that Citi has developed for a 30-day stress scenario, Citi also monitors its liquidity by reference to the LCR, as calculated pursuant to the U.S. LCR rules.

Generally, the LCR is designed to ensure that banks maintain an adequate level of HQLA to meet liquidity needs under an acute 30-day stress scenario. The LCR is calculated by dividing HQLA by estimated net outflows over a stressed 30-day period, with the net outflows determined by applying prescribed outflow factors to various categories of liabilities, such as deposits, unsecured and secured wholesale borrowings, unused lending commitments and derivatives-related exposures, partially offset by inflows from assets maturing within 30 days. Banks are required to calculate an add-on to address potential maturity mismatches between contractual cash outflows and inflows within

the 30-day period in determining the total amount of net outflows. The minimum LCR requirement is 100%.

The table below details the components of Citi's LCR calculation and HQLA in excess of net outflows for the periods indicated:

In billions of dollars	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
HQLA	$403.7	$420.8	$446.4
Net outflows	334.8	350.8	364.3
LCR	121 %	120 %	123 %
HQLA in excess of net outflows	$68.9	$70.0	$82.1

Note: The amounts are presented on an average basis.

Citi's LCR decreased year-over-year, driven by a decline in average HQLA, partially offset by a decline in modeled net outflows. Quarter-over-quarter, Citi's LCR increased slightly, as a decline in modeled net outflows more than offset the decline in average HQLA (see "High-Quality Liquid Assets" above).

Long-Term Liquidity Measurement: Net Stable Funding Ratio (NSFR)

In 2016, the Federal Reserve Board, the FDIC and the OCC issued a proposed rule to implement the Basel III NSFR requirement.

The U.S.-proposed NSFR is largely consistent with the Basel Committee's final NSFR rules. In general, the NSFR assesses the availability of a bank's stable funding against a required level. A bank's available stable funding would include portions of equity, deposits and long-term debt, while its required stable funding would be based on the liquidity characteristics and encumbrance period of its assets, derivatives and commitments. Prescribed factors would be required to be applied to the various categories of asset and liabilities classes. The ratio of available stable funding to required stable funding would be required to be greater than 100%. While Citi believes that it is compliant with the proposed U.S. NSFR rules as of December 31, 2018, it will need to evaluate a final version of the rules, which are expected to be released in 2019. Citi expects that the NSFR final rules implementation period will be communicated along with the final version of the rules.

Loans

As part of its funding and liquidity objectives, Citi seeks to fund its existing asset base appropriately as well as maintain sufficient liquidity to grow its GCB and ICG businesses, including its loan portfolio. Citi maintains a diversified portfolio of loans to its consumer and institutional clients. The table below details the average loans, by business and/or segment, and the total end-of-period loans for each of the periods indicated:

In billions of dollars	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Global Consumer Banking			
North America	$195.7	$192.8	$189.7
Latin America	25.1	26.3	25.7
Asia[(1)]	87.6	87.7	87.9
Total	$308.4	$306.8	$303.3
Institutional Clients Group			
Corporate lending	$130.0	$130.9	$124.9
Treasury and trade solutions (TTS)	77.0	76.9	77.0
Private bank	94.7	92.8	85.9
Markets and securities services and other	49.3	45.6	40.4
Total	$351.0	$346.2	$328.2
Total Corporate/Other	$16.1	$17.3	$22.5
Total Citigroup loans (AVG)	$675.5	$670.3	$654.0
Total Citigroup loans (EOP)	$684.2	$674.9	$667.0

(1) Includes loans in certain EMEA countries for all periods presented.

Loans increased 3% year-over-year and 1% quarter-over-quarter in the fourth quarter, on both an end-of-period as well as on an average basis.

Excluding the impact of FX translation, average loans increased 4% year-over-year, driven by 6% aggregate across GCB and ICG. Within GCB, average loans grew 3%, with growth across all regions and businesses, with particular strength in North America GCB driven by Citi-branded cards and Citi retail services, including the impact of the L.L.Bean card portfolio acquisition.

Average ICG loans increased 8% year-over-year, with continued growth across businesses. Corporate lending and private bank loan growth remained strong on a year-over-year basis, with corporate lending unchanged quarter-over-quarter due to the episodic nature of repayments relative to originations. TTS loans grew year-over-year, however growth moderated to 2%, despite continued strong origination volumes, as Citi utilized its distribution capabilities to optimize the balance sheet and drive returns. Finally, strong year-over-year Markets and securities services loan growth was driven by Community Reinvestment Act lending activities as well as residential warehouse lending.

Average Corporate/Other loans continued to decline (down 32%), driven by the wind-down of legacy assets.

Deposits

The table below details the average deposits, by business and/or segment, and the total end-of-period deposits for each of the periods indicated:

In billions of dollars	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Global Consumer Banking			
North America	$180.6	$180.2	$182.7
Latin America	28.2	29.4	27.8
Asia[(1)]	97.7	97.6	96.0
Total	$306.5	$307.2	$306.5
Institutional Clients Group			
Treasury and trade solutions (TTS)	$470.8	$456.7	$444.5
Banking ex-TTS	128.4	124.6	126.9
Markets and securities services	86.7	86.7	82.9
Total	$685.9	$668.0	$654.4
Total Corporate/Other	$13.3	$10.6	$12.4
Total Citigroup deposits (AVG)	$1,005.7	$985.7	$973.3
Total Citigroup deposits (EOP)	$1,013.2	$1,005.2	$959.8

(1) Includes deposits in certain EMEA countries for all periods presented.

End-of-period deposits increased 6% year-over-year and 1% quarter-over-quarter. On an average basis, deposits increased 3% year-over-year and 2% quarter-over-quarter.

Excluding the impact of FX translation, average deposits increased 5% year-over-year. In GCB, deposits increased 1%, as strong growth in Asia GCB and Latin America GCB more than offset a 1% decline in North America GCB, as clients transferred cash into investment accounts.

In ICG, deposits increased 6%, primarily driven by continued high-quality deposit growth in TTS.

Long-Term Debt

Long-term debt (generally defined as debt with original maturities of one year or more) represents the most significant component of Citi's funding for the parent entities and is a supplementary source of funding for the bank entities. Long-term debt is an important funding source due in part to its multi-year contractual maturity structure. The weighted-average maturity of unsecured long-term debt issued by Citigroup and its affiliates (including Citibank) with a remaining life greater than one year was approximately 6.8 years as of December 31, 2018, a slight decline from 6.9 years as of September 30, 2018 and unchanged from the prior year.

Citi's long-term debt outstanding at the parent company includes senior and subordinated debt and what Citi refers to as customer-related debt, consisting of structured notes, such as equity- and credit-linked notes, as well as non-structured notes. Citi's issuance of customer-related debt is generally driven by customer demand and supplements benchmark debt issuance as a source of funding for Citi's non-bank entities.

Citi's long-term debt at the bank also includes benchmark senior debt, FHLB advances and securitizations.

Long-Term Debt Outstanding

The following table details Citi's end-of-period total long-term debt outstanding for each of the dates indicated:

In billions of dollars	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Parent and other[(1)]			
Benchmark debt:			
Senior debt	$104.6	$107.2	$109.8

Subordinated debt	24.5	25.1	26.9
Trust preferred	1.7	1.7	1.7
Customer-related debt	37.1	35.4	30.7
Local country and other[2]	2.9	3.8	1.8
Total parent and other	$170.8	$173.2	$170.9
Bank			
FHLB borrowings	$10.5	$10.5	$19.3
Securitizations[3]	28.4	27.4	30.3
CBNA benchmark senior debt	18.8	21.0	12.5
Local country and other[2]	3.5	3.2	3.7
Total bank	$61.2	$62.1	$65.8
Total long-term debt	$232.0	$235.3	$236.7

Note: Amounts represent the current value of long-term debt on Citi's Consolidated Balance Sheet which, for certain debt instruments, includes consideration of fair value, hedging impacts and unamortized discounts and premiums.

(1) "Parent and other" includes long-term debt issued to third parties by the parent holding company (Citigroup) and Citi's non-bank subsidiaries (including broker-dealer subsidiaries) that are consolidated into Citigroup. As of December 31, 2018, "parent and other" included $27.0 billion of long-term debt issued by Citi's broker-dealer subsidiaries.

(2) Local country debt includes debt issued by Citi's affiliates in support of their local operations.

(3) Predominantly credit card securitizations, primarily backed by Citi-branded credit card receivables.

Citi's total long-term debt outstanding decreased both year-over-year and quarter-over-quarter. The decrease year-over-year was primarily driven by a decline in long-term debt at the bank, as declines in FHLB advances more than offset an increase in unsecured senior benchmark debt. At the parent, long-term debt remained largely unchanged year-over-year, as declines in unsecured benchmark debt were largely offset by increases in customer-related debt. Quarter-over-quarter, the decrease was driven primarily by declines in unsecured senior debt at the parent and the bank.

As part of its liability management, Citi has considered, and may continue to consider, opportunities to repurchase its long-term debt pursuant to open market purchases, tender offers or other means. Such repurchases help reduce Citi's overall funding costs. During 2018, Citi repurchased an aggregate of approximately $5.4 billion of its outstanding long-term debt, including early redemptions of FHLB advances.

Long-Term Debt Issuances and Maturities

The table below details Citi's long-term debt issuances and maturities (including repurchases and redemptions) during the periods presented:

	2018		2017		2016	
In billions of dollars	Maturities	Issuances	Maturities	Issuances	Maturities	Issuances
Parent and other						
Benchmark debt:						
Senior debt	$18.5	$ 14.8	$14.1	$ 21.6	$14.9	$ 26.0
Subordinated debt	2.9	0.6	1.6	1.3	3.2	4.0
Customer-related debt	6.6	16.9	7.6	12.3	10.2	10.5
Local country and other	1.2	2.3	1.2	0.1	2.1	2.2
Total parent and other	$29.2	$ 34.6	$24.5	$ 35.3	$30.4	$ 42.7
Bank						
FHLB borrowings	$15.8	$ 7.9	$7.8	$ 5.5	$10.5	$ 14.3
Securitizations	8.6	6.8	5.3	12.2	10.7	3.3
CBNA benchmark senior debt	2.3	8.5	—	12.6	—	—
Local country and other	2.2	2.9	3.4	2.4	3.9	3.4
Total bank	$28.9	$ 26.1	$16.5	$ 32.7	$25.1	$ 21.0
Total	$58.1	$ 60.7	$41.0	$ 68.0	$55.5	$ 63.7

The table below shows Citi's aggregate long-term debt maturities (including repurchases and redemptions) in 2018, as well as its aggregate expected annual long-term debt maturities as of December 31, 2018:

	Maturities							
In billions of dollars	2018	2019	2020	2021	2022	2023	Thereafter	Total
Parent and other								
Benchmark debt:								
Senior debt	$18.5	$14.1	$8.8	$14.1	$8.1	$12.5	$ 46.9	$104.6
Subordinated debt	2.9	—	—	—	0.7	1.1	22.6	24.5
Trust preferred	—	—	—	—	—	—	1.7	1.7
Customer-related debt	6.6	3.7	6.8	3.4	2.6	2.8	17.8	37.1
Local country and other	1.2	2.0	0.1	0.2	0.1	—	0.7	2.9
Total parent and other	$29.2	$19.8	$15.7	$17.7	$11.5	$16.4	$ 89.7	$170.8
Bank								
FHLB borrowings	$15.8	$5.6	$4.9	$—	$—	$—	$ —	$10.5
Securitizations	8.6	7.9	6.0	5.7	2.2	2.5	4.0	28.4
CBNA benchmark senior debt	2.3	4.7	8.7	5.0	—	—	0.3	18.8
Local country and other	2.2	0.6	2.0	0.2	0.4	0.1	0.4	3.5
Total bank	$28.9	$18.8	$21.6	$10.9	$2.6	$2.6	$ 4.7	$61.2
Total long-term debt	$58.1	$38.6	$37.3	$28.6	$14.1	$19.0	$ 94.4	$232.0

Resolution Plan

Citi is required under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act) and the rules promulgated by the FDIC and FRB to periodically submit a plan for Citi's rapid and orderly resolution under the U.S. Bankruptcy Code in the event of material financial distress or failure. For additional information on Citi's resolution plan submissions, see "Risk Factors—Strategic Risks" above. Citigroup's preferred resolution strategy is "single point of entry" under the U.S. Bankruptcy Code.

Under Citi's resolution plan, only Citigroup, the parent holding company, would enter into bankruptcy, while Citigroup's material legal entities (as defined in the public section of its 2017 resolution plan, which can be found on the FRB's and FDIC's websites) would remain operational and outside of any resolution or insolvency proceedings. Citigroup believes its resolution plan has been designed to minimize the risk of systemic impact to the U.S. and global financial systems, while maximizing the value of the bankruptcy estate for the benefit of Citigroup's creditors, including its unsecured long-term debt holders. In addition, in line with the Federal Reserve's final total loss-absorbing capacity (TLAC) rule, Citigroup believes it has developed the resolution plan so that Citigroup's shareholders and unsecured creditors—including its unsecured long-term debt holders—bear any losses resulting from Citigroup's bankruptcy. Accordingly, any value realized by holders of its unsecured long-term debt may not be sufficient to repay the amounts owed to such debt holders in the event of a bankruptcy or other resolution proceeding of Citigroup.

The FDIC has also indicated that it was developing a single point of entry strategy to implement its resolution authority under Title II of the Dodd-Frank Act.

In response to feedback received from the Federal Reserve and FDIC on Citigroup's 2015 resolution plan, Citigroup took the following actions in connection with its 2017 resolution plan submission:

(i) Citicorp LLC (Citicorp), an existing wholly owned subsidiary of Citigroup, was established as an intermediate holding company (an IHC) for certain of Citigroup's operating material legal entities;

(ii) Citigroup executed an inter-affiliate agreement with Citicorp, Citigroup's operating material legal entities and certain other affiliated entities pursuant to which Citicorp is required to provide liquidity and capital support to Citigroup's operating material legal entities in the event Citigroup were to enter bankruptcy proceedings (Citi Support Agreement);

(iii) pursuant to the Citi Support Agreement:

- Citigroup made an initial contribution of assets, including certain high-quality liquid assets and inter-affiliate loans (Contributable Assets), to Citicorp, and Citicorp became the business as usual funding vehicle for Citigroup's operating material legal entities;
- Citigroup will be obligated to continue to transfer Contributable Assets to Citicorp over time, subject to certain amounts retained by Citigroup to, among other things, meet Citigroup's near-term cash needs;
- in the event of a Citigroup bankruptcy, Citigroup will be required to contribute most of its remaining assets to Citicorp; and

(iv) the obligations of both Citigroup and Citicorp under the Citi Support Agreement, as well as the Contributable Assets, are secured pursuant to a security agreement.

The Citi Support Agreement provides two mechanisms, besides Citicorp's issuing of dividends to Citigroup, pursuant to which Citicorp will be required to transfer cash to Citigroup during business as usual so that Citigroup can fund its debt service as well as other operating needs: (i) one or more funding notes issued by Citicorp to Citigroup and (ii) a committed line of credit under which Citicorp may make loans to Citigroup.

Total Loss-Absorbing Capacity (TLAC)

In 2016, the Federal Reserve Board imposed minimum external TLAC and long-term debt (LTD) requirements on U.S. global systemically important bank holding companies (GSIBs), including Citi, effective as of January 1, 2019.

As a result, U.S. GSIBs will be required to maintain minimum levels of TLAC and eligible LTD, each set by reference to the GSIB's consolidated risk-weighted assets (RWA) and total leverage exposure, as described further below. The intended purpose of the requirements is to facilitate the orderly resolution of U.S. GSIBs under the U.S. Bankruptcy Code and Title II of the Dodd-Frank Act. Citi believes it exceeded the minimum TLAC and LTD requirements as of December, 31, 2018. For additional information, see "Risk Factors—Compliance, Conduct and Legal Risks" above.

Minimum TLAC Requirements

The minimum TLAC requirement is the greater of (i) 18% of the GSIB's RWA plus the then-applicable RWA-based TLAC buffer (see below) and (ii) 7.5% of the GSIB's total leverage exposure plus a leveraged-based TLAC buffer of 2% (i.e., 9.5%).

The RWA-based TLAC buffer equals the 2.5% capital conservation buffer, plus any applicable countercyclical capital buffer (currently 0%), plus the GSIB's capital surcharge as determined under method 1 of the GSIB surcharge rule (2.0% for Citi for 2019). Accordingly, Citi estimates its total current minimum TLAC requirement is 22.5% of RWA for 2019.

Minimum Eligible LTD Requirements

The minimum LTD requirement is the greater of (i) 6% of the GSIB's RWA plus its capital surcharge as determined under method 2 of the GSIB surcharge rule (3.0% for Citi for 2019), for a total current requirement of 9% of RWA for Citi, and (ii) 4.5% of the GSIB's total leverage exposure.

For additional discussion of the method 1 and method 2 GSIB capital surcharge methodologies, see "Capital Resources—Current Regulatory Capital Standards" above.

Secured Funding Transactions and Short-Term Borrowings

Citi supplements its primary sources of funding with short-term borrowings. Short-term borrowings generally include (i) secured funding transactions (securities loaned or sold under agreements to repurchase, or repos) and (ii) to a lesser extent, short-term borrowings consisting of commercial paper and borrowings from the FHLB and other market participants (see Note 17 to the Consolidated Financial Statements for further information on Citigroup's and its affiliates' outstanding short-term borrowings).

Outside of secured funding transactions, Citi's short-term borrowings decreased both year-over-year (27% decrease) and quarter-over-quarter (4% decrease), driven primarily by Citi's continued efforts to optimize its funding profile.

Secured Funding

Secured funding is primarily accessed through Citi's broker-dealer subsidiaries to efficiently fund both (i) secured lending activity and (ii) a portion of the securities inventory held in the context of market making and customer activities. Citi also executes a smaller portion of its secured funding transactions through its bank entities, which is typically collateralized by foreign government debt securities. Generally, daily changes in the level of Citi's secured funding are primarily due to fluctuations in secured lending activity in the matched book (as described below) and securities inventory.

Secured funding of $178 billion as of December 31, 2018 increased 14% from the prior year and 1% from the prior quarter. Excluding the impact of FX translation, secured funding increased 17% from the prior year and 2% from the prior quarter, both driven by normal business activity. Average balances for secured funding were $177 billion for the quarter ended December 31, 2018.

The portion of secured funding in the broker-dealer subsidiaries that funds secured lending is commonly referred to as "matched book" activity. The majority of this activity is secured by high-quality liquid securities such as U.S. Treasury securities, U.S. agency securities and foreign government debt securities. Other secured funding is secured by less-liquid securities, including equity securities, corporate bonds and asset-backed securities. The tenor of Citi's matched book liabilities is generally equal to or longer than the tenor of the corresponding matched book assets.

The remainder of the secured funding activity in the broker-dealer subsidiaries serves to fund securities inventory held in the context of market making and customer activities. To maintain reliable funding under a wide range of market conditions, including under periods of stress, Citi manages these activities by taking into consideration the quality of the underlying collateral and stipulating financing tenor. The weighted average maturity of Citi's secured funding of less-liquid securities inventory was greater than 110 days as of December 31, 2018.

Citi manages the risks in its secured funding by conducting daily stress tests to account for changes in capacity, tenors, haircut, collateral profile and client actions. Additionally, Citi maintains counterparty diversification by establishing concentration triggers and assessing counterparty reliability and stability under stress. Citi generally sources secured funding from more than 150 counterparties.

Overall Short-Term Borrowings

The following table contains the year-end, average and maximum month-end amounts for the following respective short-term borrowings categories at the end of each of the three prior years:

	Federal funds purchased and securities sold under agreements to repurchase			Short-term borrowings[1]					
				Commercial paper[2]			Other short-term borrowings[3]		
In billions of dollars	2018	2017	2016	2018	2017	2016	2018	2017	2016
Amounts outstanding at year end	$177.8	$156.3	$141.8	$13.2	$9.9	$10.0	$19.1	$34.5	$20.7
Average outstanding during the year[4][5]	172.1	157.7	158.1	11.8	10.0	10.0	26.5	23.2	14.8
Maximum month-end outstanding	191.2	163.0	171.7	13.2	10.1	10.2	34.0	34.5	20.9
Weighted-average interest rate									
During the year[4][5][6]	2.84 %	1.69 %	1.21 %	2.19 %	1.27 %	0.80 %	4.17 %	2.81 %	2.32 %
At year end[7]				1.95	1.28	0.79	2.99	1.62	1.39

(1) Original maturities of less than one year.

(2) Substantially all commercial paper outstanding was issued by certain Citibank entities for the periods presented.

(3) Other short-term borrowings include borrowings from the FHLB and other market participants.

(4) Interest rates and amounts include the effects of risk management activities associated with the respective liability categories.

(5) Average volumes of securities sold under agreements to repurchase are reported net pursuant to ASC 210-20-45; average rates exclude the impact of ASC 210-20-45.

(6) Average rates reflect prevailing local interest rates, including inflationary effects and monetary correction in certain countries.

(7) Based on contractual rates at respective year ends; non-interest-bearing accounts are excluded from the weighted average interest rate calculated at year end.

Credit Ratings

Citigroup's funding and liquidity, funding capacity, ability to access capital markets and other sources of funds, the cost of these funds and its ability to maintain certain deposits are partially dependent on its credit ratings.

The table below shows the ratings for Citigroup and Citibank as of December 31, 2018. While not included in the table below, the long- and short-term ratings of Citigroup Global Markets Holding Inc. (CGMHI) were BBB+/A-2 at Standard & Poor's and A/F1 at Fitch as of December 31, 2018.

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	Citigroup Inc.			Citibank, N.A.		
Ratings as of December 31, 2018	Senior debt	Commercial paper	Outlook	Long-term	Short-term	Outlook
Fitch Ratings (Fitch)	A	F1	Stable	A+	F1	Stable
Moody's Investors Service (Moody's)	Baa1	P-2	Under review	A1	P-1	Under review
Standard & Poor's (S&P)	BBB+	A-2	Stable	A+	A-1	Stable

Recent Credit Ratings Developments

On November 29, 2018, Moody's placed the long-term ratings of Citigroup and Citibank, N.A. on "Review for Possible Upgrade." Over the course of the review period, Moody's will assess, among other things, Citi's ability to achieve its medium-term efficiency and profitability targets while maintaining strong governance and risk controls.

On February 21, 2019, Moody's upgraded the ratings for long-term debt, deposits and counterparty risk of Citigroup and certain of its subsidiaries, as well as the baseline credit assessment (BCA) of Citibank, N.A. In addition, Moody's affirmed all short-term ratings and assessments of Citigroup and those subsidiaries. The ratings outlook was changed to "Stable" from "Review for Possible Upgrade."

Potential Impacts of Ratings Downgrades

Ratings downgrades by Moody's, Fitch or S&P could negatively impact Citigroup's and/or Citibank's funding and liquidity due to reduced funding capacity, including derivative triggers, which could take the form of cash obligations and collateral requirements.

The following information is provided for the purpose of analyzing the potential funding and liquidity impact to Citigroup and Citibank of a hypothetical, simultaneous

ratings downgrade across all three major rating agencies. This analysis is subject to certain estimates, estimation methodologies, judgments and uncertainties. Uncertainties include potential ratings limitations that certain entities may have with respect to permissible counterparties, as well as general subjective counterparty behavior. For example, certain corporate customers and markets counterparties could re-evaluate their business relationships with Citi and limit transactions in certain contracts or market instruments with Citi. Changes in counterparty behavior could impact Citi's funding and liquidity, as well as the results of operations of certain of its businesses. The actual impact to Citigroup or Citibank is unpredictable and may differ materially from the potential funding and liquidity impacts described below. For additional information on the impact of credit rating changes

on Citi and its applicable subsidiaries, see "Risk Factors—Liquidity Risks" above.

Citigroup Inc. and Citibank—Potential Derivative Triggers

As of December 31, 2018, Citi estimates that a hypothetical one-notch downgrade of the senior debt/long-term rating of Citigroup Inc. across all three major rating agencies could impact Citigroup's funding and liquidity due to derivative triggers by approximately $0.2 billion, compared to $0.4 billion as of September 30, 2018. Other funding sources, such as secured financing transactions and other margin requirements, for which there are no explicit triggers, could also be adversely affected.

As of December 31, 2018, Citi estimates that a hypothetical one-notch downgrade of the senior debt/long-term rating of Citibank across all three major rating agencies could impact Citibank's funding and liquidity by approximately $0.5

billion, compared to $1.2 billion as of September 30, 2018.

In total, Citi estimates that a one-notch downgrade of Citigroup and Citibank, across all three major rating agencies, could result in increased aggregate cash obligations and collateral requirements of approximately $0.7 billion, compared to $1.6 billion as of September 30, 2018 (see also Note 22 to the Consolidated Financial Statements). As detailed under “High-Quality Liquid Assets” above, the liquidity resources that are eligible for inclusion in the calculation of Citi’s consolidated HQLA were approximately $339 billion for Citibank and $65 billion for Citi’s non-bank and other entities, for a total of approximately $404 billion as of December 31, 2018. These liquidity resources are available in part as a contingency for the potential events described above.

In addition, a broad range of mitigating actions are currently included in Citigroup’s and Citibank’s contingency funding plans. For Citigroup, these mitigating factors include, but are not limited to, accessing surplus funding capacity from existing clients, tailoring levels of secured lending and adjusting the size of select trading books and collateralized borrowings from certain Citibank subsidiaries. Mitigating actions available to Citibank include, but are not limited to,

selling or financing highly liquid government securities, tailoring levels of secured lending, adjusting the size of select trading assets, reducing loan originations and renewals, raising additional deposits or borrowing from the FHLB or central banks. Citi believes these mitigating actions could substantially reduce the funding and liquidity risk, if any, of the potential downgrades described above.

Citibank—Additional Potential Impacts

In addition to the above derivative triggers, Citi believes that a potential downgrade of Citibank's senior debt/long-term rating across any of the three major rating agencies could also have an adverse impact on the commercial paper/short-term rating of Citibank. As of December 31, 2018, Citibank had liquidity commitments of approximately $13.2 billion to consolidated asset-backed commercial paper conduits, compared to $12.1 billion as of September 30, 2018 (as referenced in Note 21 to the Consolidated Financial Statements).

In addition to the above-referenced liquidity resources of certain Citibank entities, Citibank could reduce the funding and liquidity risk, if any, of the potential downgrades described above through mitigating actions, including repricing or reducing certain commitments to commercial paper conduits. In the event of the potential downgrades described above, Citi believes that certain corporate customers could re-evaluate their deposit relationships with Citibank. This re-evaluation could result in clients adjusting their discretionary deposit levels or changing their depository institution, which could potentially reduce certain deposit levels at Citibank. However, Citi could choose to adjust pricing, offer alternative deposit products to its existing customers or seek to attract deposits from new customers, in addition to the mitigating actions referenced above.

MARKET RISK

Overview

Market risk is the potential for losses arising from changes in the value of Citi's assets and liabilities resulting from changes in market variables such as interest rates, foreign exchange rates, equity prices, commodity prices and credit spreads, as well as their implied volatilities. Market risk emanates from both Citi's trading and non-trading portfolios. For additional information on market risk, see "Risk Factors" above.

Each business is required to establish, with approval from Citi's market risk management, a market risk limit framework for identified risk factors that clearly defines approved risk profiles and is within the parameters of Citi's overall risk appetite. These limits are monitored by the Risk organization, Citi's country and business Asset and Liability Committees and the Citigroup Asset and Liability Committee. In all cases, the businesses are ultimately responsible for the market risks taken and for remaining within their defined limits.

Market Risk of Non-Trading Portfolios

Market risk from non-trading portfolios stems from the potential impact of changes in interest rates and foreign exchange rates on Citi's net interest revenues, the changes in Accumulated other comprehensive income (loss) (AOCI) from its debt securities portfolios and capital invested in foreign currencies.

Net Interest Revenue at Risk

Net interest revenue, for interest rate exposure purposes, is the difference between the yield earned on the non-trading portfolio assets (including customer loans) and the rate paid on the liabilities (including customer deposits or company borrowings). Net interest revenue is affected by changes in the level of interest rates, as well as the amounts and mix of assets and liabilities, and the timing of contractual and assumed repricing of assets and liabilities to reflect market rates.

Citi's principal measure of risk to net interest revenue is interest rate exposure (IRE). IRE measures the change in expected net interest revenue in each currency resulting solely from unanticipated changes in forward interest rates. Citi's estimated IRE incorporates various assumptions including prepayment rates on loans, customer behavior and the impact of pricing decisions. For example, in rising interest rate scenarios, portions of the deposit portfolio may be assumed to experience rate increases that are less than the change in market interest rates. In declining interest rate scenarios, it is assumed that mortgage portfolios experience higher prepayment rates. IRE assumes that businesses and/or Citi Treasury make no additional changes in balances or positioning in response to the unanticipated rate changes.

In order to manage changes in interest rates effectively, Citi may modify pricing on new customer loans and deposits, purchase fixed-rate securities, issue debt that is either fixed or floating or enter into derivative transactions that have the opposite risk exposures. Citi regularly assesses the viability of these and other strategies to reduce its interest rate risks and

implements such strategies when it believes those actions are prudent.

Citi manages interest rate risk as a consolidated Company-wide position. Citi's client-facing businesses create interest rate sensitive positions, including loans and deposits, as part of their ongoing activities. Citi Treasury aggregates these risk positions and manages them centrally. Operating within established limits, Citi Treasury makes positioning decisions and uses tools, such as Citi's investment securities portfolio, company-issued debt and interest rate derivatives, to target the desired risk profile. Changes in Citi's interest rate risk position reflect the accumulated changes in all non-trading assets and liabilities, with potentially large and offsetting impacts, as well as in Citi Treasury's positioning decisions.

Citigroup employs additional measurements, including stress testing the impact of non-linear interest rate movements on the value of the balance sheet; the analysis of portfolio duration and volatility, particularly as they relate to mortgage loans and mortgage-backed securities, and the potential impact of the change in the spread between different market indices.

Interest Rate Risk of Investment Portfolios—Impact on AOCI

Citi also measures the potential impacts of changes in interest rates on the value of its AOCI, which can in turn impact Citi's common equity and tangible common equity. This will impact Citi's Common Equity Tier 1 and other regulatory capital ratios. Citi's goal is to benefit from an increase in the market level of interest rates, while limiting the impact of changes in AOCI on its regulatory capital position.

AOCI at risk is managed as part of the Company-wide interest rate risk position. AOCI at risk considers potential changes in AOCI (and the corresponding impact on the Common Equity Tier 1 Capital ratio) relative to Citi's capital generation capacity.

The following table shows the estimated impact to Citi's net interest revenue, AOCI and the Common Equity Tier 1 Capital ratio, each assuming an unanticipated parallel instantaneous 100 bps increase in interest rates:

In millions of dollars, except as otherwise noted	Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Estimated annualized impact to net interest revenue			
U.S. dollar[1]	$758	$879	$1,471
All other currencies	661	649	598
Total	$1,419	$1,528	$2,069
As a percentage of average interest-earning assets	0.08 %	0.09 %	0.12 %
Estimated initial impact to AOCI (after-tax)[2][3]	$(3,920)	$(4,597)	$(4,853)
Estimated initial impact on Common Equity Tier 1 Capital ratio (bps)[3]	(28)	(31)	(35)

(1) Certain trading-oriented businesses within Citi have accrual-accounted positions that are excluded from the estimated impact to net interest revenue in the table, since these exposures are managed economically in combination with mark-to-market positions. The U.S. dollar interest rate exposure associated with these businesses was $(242) million for a 100 bps instantaneous increase in interest rates as of December 31, 2018.

(2) Includes the effect of changes in interest rates on AOCI related to investment securities, cash flow hedges and pension liability adjustments.

(3) Results as of December 31, 2017 reflect the impact of Tax Reform, including the lower expected effective tax rate and the impact to Citi's DTA position.

The 2018 decrease in the estimated impact to net interest revenue primarily reflected changes in Citi's balance sheet composition, including increased sensitivity in deposits combined with loan growth, and Citi Treasury positioning. The 2018 changes in the estimated impact to AOCI and the Common Equity Tier 1 Capital ratio primarily reflected the impact of the composition of Citi Treasury's investment and derivatives portfolio.

In the event of an unanticipated parallel instantaneous 100 bps increase in interest rates, Citi expects that the negative impact to AOCI would be offset in shareholders' equity

through the combination of expected incremental net interest revenue and the expected recovery of the impact on AOCI through accretion of Citi's investment portfolio over a period of time. As of December 31, 2018, Citi expects that the negative $3.9 billion impact to AOCI in such a scenario could potentially be offset over approximately 18 months.

The following table shows the estimated impact to Citi's net interest revenue, AOCI and the Common Equity Tier 1 Capital ratio under four different changes in interest rate scenarios for the U.S. dollar and Citi's other currencies.

In millions of dollars, except as otherwise noted	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Overnight rate change (bps)	100	100	—	—
10-year rate change (bps)	100	—	100	(100)
Estimated annualized impact to net interest revenue				
U.S. dollar	$758	$755	$40	$(52)
All other currencies	661	585	37	(36)
Total	$1,419	$1,340	$77	$(88)
Estimated initial impact to AOCI (after-tax)[1]	$(3,920)	$(2,405)	$(1,746)	$1,252
Estimated initial impact to Common Equity Tier 1 Capital ratio (bps)	(28)	(16)	(14)	9

Note: Each scenario assumes that the rate change will occur instantaneously. Changes in interest rates for maturities between the overnight rate and the 10-year rate are interpolated.

(1) Includes the effect of changes in interest rates on AOCI related to investment securities, cash flow hedges and pension liability adjustments.

As shown in the table above, the magnitude of the impact to Citi's net interest revenue and AOCI is greater under scenario 2 as compared to scenario 3. This is because the combination of changes to Citi's investment portfolio,

partially offset by changes related to Citi’s pension liabilities, results in a net position that is more sensitive to rates at shorter- and intermediate-term maturities.

Changes in Foreign Exchange Rates—Impacts on AOCI and Capital

As of December 31, 2018, Citi estimates that an unanticipated parallel instantaneous 5% appreciation of the U.S. dollar against all of the other currencies in which Citi has invested capital could reduce Citi's tangible common equity (TCE) by approximately $1.4 billion, or 1.0%, as a result of changes to Citi's foreign currency translation adjustment in AOCI, net of hedges. This impact would be primarily due to changes in the value of the Mexican peso, the Euro and the Australian dollar.

This impact is also before any mitigating actions Citi may take, including ongoing management of its foreign currency translation exposure. Specifically, as currency movements change the value of Citi's net investments in foreign currency-denominated capital, these movements also change the value of Citi's risk-weighted assets denominated in those currencies. This, coupled with Citi's foreign currency hedging strategies, such as foreign currency borrowings, foreign currency forwards and other currency hedging instruments, lessens the impact of foreign currency movements on Citi's Common Equity Tier 1 Capital ratio. Changes in these hedging strategies, as well as hedging costs, divestitures and tax impacts, can further affect the actual impact of changes in foreign exchange rates on Citi's capital as compared to an unanticipated parallel shock, as described above.

The effect of Citi's ongoing management strategies with respect to changes in foreign exchange rates and the impact of these changes on Citi's TCE and Common Equity Tier 1 Capital ratio are shown in the table below. For additional information on the changes in AOCI, see Note 19 to the Consolidated Financial Statements.

In millions of dollars, except as otherwise noted	For the quarter ended Dec. 31, 2018	Sept. 30, 2018	Dec. 31, 2017
Change in FX spot rate[1]	(1.6)%	(0.2)%	(1.2)%
Change in TCE due to FX translation, net of hedges	$(491)	$(354)	$(498)
As a percentage of TCE	(0.3)%	(0.2)%	(0.3)%
Estimated impact to Common Equity Tier 1 Capital ratio (on a fully implemented basis) due to changes in FX translation, net of hedges (bps)	(1)	—	(5)

(1) FX spot rate change is a weighted average based upon Citi's quarterly average GAAP capital exposure to foreign countries.

Interest Revenue/Expense and Net Interest Margin

In millions of dollars, except as otherwise noted	2018	2017	2016	Change 2018 vs. 2017	Change 2017 vs. 2016
Interest revenue[1]	$71,082	$62,075	$58,450	15 %	6 %
Interest expense[2]	24,266	16,518	12,512	47	32
Net interest revenue	$46,816	$45,557	$45,938	3 %	(1)%
Interest revenue—average rate	4.08 %	3.71 %	3.67 %	37 bps	4 bps
Interest expense—average rate	1.77	1.28	1.03	49 bps	25 bps
Net interest margin[3]	2.69	2.73	2.88	(4) bps	(15) bps
Interest rate benchmarks					
Two-year U.S. Treasury note—average rate	2.53 %	1.40 %	0.83 %	113 bps	57 bps
10-year U.S. Treasury note—average rate	2.91	2.33	1.83	58 bps	50 bps
10-year vs. two-year spread	38 bps	93 bps	100 bps		

Note: All interest expense amounts include FDIC insurance assessments, as well as similar deposit insurance assessments outside of the U.S. As of the fourth quarter of 2018, Citi's FDIC surcharge was eliminated (approximately $130 million per quarter).

(1) Net interest revenue includes the taxable equivalent adjustments related to the tax-exempt bond portfolio (based on the U.S. federal statutory tax rates of 21% in 2018 and 35% in 2017 and 2016) of $254 million, $496 million and $462 million for 2018, 2017 and 2016, respectively.

(2) Interest expense associated with certain hybrid financial instruments, which are classified as Long-term debt and accounted for at fair value, is reported together with any changes in fair value as part of Principal transactions in the Consolidated Statements of Income and is therefore not reflected in Interest expense in the table above.

(3) Citi's net interest margin (NIM) is calculated by dividing net interest revenue by average interest-earning assets.

Citi's net interest revenue in the fourth quarter of 2018 increased 5% to $11.9 billion ($12.0 billion on a taxable equivalent basis) versus the prior-year period. Excluding the impact of FX translation, net interest revenue increased 8%, or approximately $0.9 billion. This increase was primarily due to higher net interest revenue ($11.7 billion, up approximately 14% or $1.4 billion) from Citi's core accrual activities, which is mainly generated by its deposit and lending businesses. The increase in core accrual net interest revenue was partially offset by lower trading-related net interest revenue ($0.1 billion, down approximately 83% or $0.4 billion), largely due to higher wholesale funding costs, and lower net interest revenue associated with the wind-down of legacy assets in Corporate/Other ($0.1 billion, down approximately 45% or

$0.1 billion). The increase in core accrual net interest revenue was mainly driven by the deployment of cash into better yielding assets, including loans, an improved loan mix and higher interest rates, as well as the impact of elimination of the FDIC surcharge. As previously disclosed, in 2016, the FDIC commenced imposing a surcharge on depository institutions, including Citibank, to increase the deposit insurance fund reserve ratio until it reached 1.35%, which occurred as of the end of the third quarter of 2018.

Citi's net interest revenue for the full year increased 3% to $46.6 billion ($46.8 billion on a taxable equivalent basis) versus the prior year. Excluding the impact of FX translation, Citi's net interest revenue increased by approximately $2.0 billion, as higher core accrual net interest revenue

(approximately $44.1 billion, up 10% or $4.1 billion) was offset by lower trading-related net interest revenue (approximately $1.0 billion, down 62% or $1.7 billion), largely driven by higher wholesale funding costs, and lower net interest revenue associated with legacy assets in Corporate/Other (approximately $0.8 billion, down 38% or $0.5 billion). The increase in core accrual net interest revenue was primarily due to loan growth, an improved loan mix, and higher interest rates.

Citi's NIM was 2.71% on a taxable equivalent basis in the fourth quarter of 2018, an increase of 1 basis point (bp) from the third quarter of 2018, driven primarily by the increase in core accrual net interest revenue, and the impact of the elimination of the FDIC surcharge, partially offset by lower trading-related NIM. Citi's core accrual NIM was 3.72%, an increase of 12 bps from the third quarter of 2018, primarily driven by the deployment of cash into better yielding assets, including loans, an improved loan mix and higher interest rates, as well as the impact of elimination of the FDIC surcharge. On a full-year basis, Citi's NIM was 2.69% on a taxable equivalent basis, compared to 2.73% in 2017, a decrease of 4 bps. Citi's full-year core accrual NIM was 3.61%, an increase of 13 bps from the prior year, primarily driven by loan growth, an improved loan mix and higher interest rates. (Citi's core accrual net interest revenue and core accrual NIM are non-GAAP financial measures. Citi believes the presentation of its net interest revenue and NIM on a core accrual basis provides a meaningful depiction for investors of the underlying fundamentals of its businesses).

Additional Interest Rate Details

Average Balances and Interest Rates—Assets[1][2][3]

Taxable Equivalent Basis

	Average volume			Interest revenue			% Average rate		
In millions of dollars, except rates	2018	2017	2016	2018	2017	2016	2018	2017	2016
Assets									
Deposits with banks[4]	$177,294	$169,385	$131,925	$2,203	$1,635	$971	1.24%	0.97%	0.74%
Federal funds sold and securities borrowed or purchased under agreements to resell[5]									
In U.S. offices	$149,879	$141,308	$147,940	$3,818	$1,922	$1,483	2.55%	1.36%	1.00%
In offices outside the U.S.[4]	117,695	106,606	85,142	1,674	1,327	1,060	1.42	1.24	1.24
Total	$267,574	$247,914	$233,082	$5,492	$3,249	$2,543	2.05%	1.31%	1.09%
Trading account assets[6][7]									
In U.S. offices	$94,065	$99,755	$105,774	$3,706	$3,531	$3,791	3.94%	3.54%	3.58%
In offices outside the U.S.[4]	115,601	104,197	98,832	2,615	2,117	2,095	2.26	2.03	2.12
Total	$209,666	$203,952	$204,606	$6,321	$5,648	$5,886	3.01%	2.77%	2.88%
Investments									
In U.S. offices									
Taxable	$228,686	$226,227	$225,764	$5,331	$4,450	$3,980	2.33%	1.97%	1.76%
Exempt from U.S. income tax	17,199	18,152	19,079	706	775	693	4.10	4.27	3.63
In offices outside the U.S.[4]	104,033	106,040	106,159	3,600	3,309	3,157	3.46	3.12	2.97
Total	$349,918	$350,419	$351,002	$9,637	$8,534	$7,830	2.75%	2.44%	2.23%
Loans (net of unearned income)[8]									
In U.S. offices	$385,350	$371,711	$360,751	$28,627	$25,944	$24,240	7.43%	6.98%	6.72%
In offices outside the U.S.[4]	285,505	267,774	262,715	17,129	15,904	15,951	6.00	5.94	6.07
Total	$670,855	$639,485	$623,466	$45,756	$41,848	$40,191	6.82%	6.54%	6.45%
Other interest-earning assets[9]	$67,269	$60,626	$50,003	$1,673	$1,161	$1,029	2.49%	1.92%	2.06%
Total interest-earning assets	$1,742,576	$1,671,781	$1,594,084	$71,082	$62,075	$58,450	4.08%	3.71%	3.67%
Non-interest-earning assets[6]	$177,654	$203,657	$214,641						
Total assets	$1,920,230	$1,875,438	$1,808,725						

(1) Net interest revenue includes the taxable equivalent adjustments related to the tax-exempt bond portfolio (based on the U.S. federal statutory tax rates of 21% in 2018 and 35% in 2017 and 2016) of $254 million, $496 million and $462 million for 2018, 2017 and 2016, respectively.

(2) Interest rates and amounts include the effects of risk management activities associated with the respective asset categories.

(3) Monthly or quarterly averages have been used by certain subsidiaries where daily averages are unavailable.

(4) Average rates reflect prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.

(5) Average volumes of securities borrowed or purchased under agreements to resell are reported net pursuant to ASC 210-20-45. However, Interest revenue excludes the impact of ASC 210-20-45.

(6) The fair value carrying amounts of derivative contracts are reported net, pursuant to ASC 815-10-45, in Non-interest-earning assets and Other non-interest-bearing liabilities.

(7) Interest expense on Trading account liabilities of ICG is reported as a reduction of Interest revenue. Interest revenue and Interest expense on cash collateral positions are reported in interest on Trading account assets and Trading account liabilities, respectively.

(8) Includes cash-basis loans.

(9) Includes brokerage receivables.

Average Balances and Interest Rates—Liabilities and Equity, and Net Interest Revenue[1][2][3]
Taxable Equivalent Basis

	Average volume			Interest expense			% Average rate		
In millions of dollars, except rates	2018	2017	2016	2018	2017	2016	2018	2017	2016
Liabilities									
Deposits									
In U.S. offices[4]	$338,060	$313,094	$288,817	$4,500	$2,530	$1,630	1.33%	0.81%	0.56%
In offices outside the U.S.[5]	453,793	436,949	429,608	5,116	4,057	3,670	1.13	0.93	0.85
Total	$791,853	$750,043	$718,425	$9,616	$6,587	$5,300	1.21%	0.88%	0.74%
Federal funds purchased and securities loaned or sold under agreements to repurchase[6]									
In U.S. offices	$102,843	$96,258	$100,472	$3,320	$1,574	$1,024	3.23%	1.64%	1.02%
In offices outside the U.S.[5]	69,264	61,434	57,588	1,569	1,087	888	2.27	1.77	1.54
Total	$172,107	$157,692	$158,060	$4,889	$2,661	$1,912	2.84%	1.69%	1.21%
Trading account liabilities[7][8]									
In U.S. offices	$37,305	$33,399	$29,481	$612	$380	$242	1.64%	1.14%	0.82%
In offices outside the U.S.[5]	58,919	57,149	44,669	389	258	168	0.66	0.45	0.38
Total	$96,224	$90,548	$74,150	$1,001	$638	$410	1.04%	0.70%	0.55%
Short-term borrowings[9]									
In U.S. offices	$85,009	$74,825	$61,015	$1,885	$684	$203	2.22%	0.91%	0.33%
In offices outside the U.S.[5]	23,402	22,837	19,184	324	375	274	1.38	1.64	1.43
Total	$108,411	$97,662	$80,199	$2,209	$1,059	$477	2.04%	1.08%	0.59%
Long-term debt[10]									
In U.S. offices	$197,933	$192,079	$175,342	$6,386	$5,382	$4,180	3.23%	2.80%	2.38%
In offices outside the U.S.[5]	4,895	4,615	6,426	165	191	233	3.37	4.14	3.63
Total	$202,828	$196,694	$181,768	$6,551	$5,573	$4,413	3.23%	2.83%	2.43%
Total interest-bearing liabilities	$1,371,423	$1,292,639	$1,212,602	$24,266	$16,518	$12,512	1.77%	1.28%	1.03%
Demand deposits in U.S. offices	$33,398	$37,824	$38,120						
Other non-interest-bearing liabilities[7]	315,862	316,129	328,538						
Total liabilities	$1,720,683	$1,646,592	$1,579,260						
Citigroup stockholders' equity	$198,681	$227,849	$228,346						
Noncontrolling interests	866	997	1,119						
Total equity	$199,547	$228,846	$229,465						
Total liabilities and stockholders' equity	$1,920,230	$1,875,438	$1,808,725						
Net interest revenue as a percentage of average interest-earning assets[11]									
In U.S. offices	$992,543	$970,439	$944,891	$28,157	$27,551	$27,929	2.84%	2.84%	2.96%
In offices outside the U.S.[5]	750,033	701,342	649,193	18,659	18,006	18,009	2.49	2.57	2.77
Total	$1,742,576	$1,671,781	$1,594,084	$46,816	$45,557	$45,938	2.69%	2.73%	2.88%

(1) Net interest revenue includes the taxable equivalent adjustments related to the tax-exempt bond portfolio (based on the U.S. federal statutory tax rates of 21% in 2018 and 35% in 2017 and 2016) of $254 million, $496 million and $462 million for 2018, 2017 and 2016, respectively.

(2) Interest rates and amounts include the effects of risk management activities associated with the respective liability categories.

(3) Monthly or quarterly averages have been used by certain subsidiaries where daily averages are unavailable.

(4) Consists of other time deposits and savings deposits. Savings deposits are made up of insured money market accounts, NOW accounts and other savings deposits. The interest expense on savings deposits includes FDIC

deposit insurance assessments.

(5) Average rates reflect prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.

(6) Average volumes of securities sold under agreements to repurchase are reported net pursuant to ASC 210-20-45. However, Interest expense excludes the impact of ASC 210-20-45.

(7) The fair value carrying amounts of derivative contracts are reported net, pursuant to ASC 815-10-45, in Non-interest-earning assets and Other non-interest-bearing liabilities.

(8) Interest expense on Trading account liabilities of ICG is reported as a reduction of Interest revenue. Interest revenue and Interest expense on cash collateral positions are reported in interest on Trading account assets and Trading account liabilities, respectively.

(9) Includes brokerage payables.

(10) Excludes hybrid financial instruments and beneficial interests in consolidated VIEs that are classified as Long-term debt, as the changes in fair value for these obligations are recorded in Principal transactions.

(11) Includes allocations for capital and funding costs based on the location of the asset.

Analysis of Changes in Interest Revenue[1][2][3]
Taxable Equivalent Basis

In millions of dollars	2018 vs. 2017 Increase (decrease) due to change in: Average volume	Average rate	Net change	2017 vs. 2016 Increase (decrease) due to change in: Average volume	Average rate	Net change
Deposits with banks[4]	$79	$489	$568	$317	$347	$664
Federal funds sold and securities borrowed or purchased under agreements to resell						
In U.S. offices	$123	$1,773	$1,896	$(69)	$508	$439
In offices outside the U.S.[4]	146	201	347	267	—	267
Total	$269	$1,974	$2,243	$198	$508	$706
Trading account assets[5]						
In U.S. offices	$(209)	$384	$175	$(214)	$(46)	$(260)
In offices outside the U.S.[4]	245	253	498	111	(89)	22
Total	$36	$637	$673	$(103)	$(135)	$(238)
Investments[1]						
In U.S. offices	$32	$780	$812	$(9)	$561	$552
In offices outside the U.S.[4]	(64)	355	291	(4)	156	152
Total	$(32)	$1,135	$1,103	$(13)	$717	$704
Loans (net of unearned income)[6]						
In U.S. offices	$974	$1,709	$2,683	$749	$955	$1,704
In offices outside the U.S.[4]	1,062	163	1,225	304	(351)	(47)
Total	$2,036	$1,872	$3,908	$1,053	$604	$1,657
Other interest-earning assets[7]	$137	$375	$512	$207	$(75)	$132
Total interest revenue	$2,525	$6,482	$9,007	$1,659	$1,966	$3,625

(1) The taxable equivalent adjustment is related to the tax-exempt bond portfolio based on the U.S. federal statutory tax rates of 21% in 2018 and 35% in 2017 and 2016, and is included in this presentation.

(2) Rate/volume variance is allocated based on the percentage relationship of changes in volume and changes in rate to the total net change.

(3) Detailed average volume, Interest revenue and Interest expense exclude Discontinued operations. See Note 2 to the Consolidated Financial Statements.

(4) Changes in average rates reflect changes in prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.

(5) Interest expense on Trading account liabilities of ICG is reported as a reduction of Interest revenue. Interest revenue and Interest expense on cash collateral positions are reported in interest on Trading account assets and Trading account liabilities, respectively.

(6) Includes cash-basis loans.

(7) Includes brokerage receivables.

Analysis of Changes in Interest Expense and Net Interest Revenue[1][2][3]
Taxable Equivalent Basis

In millions of dollars	2018 vs. 2017 Increase (decrease) due to change in: Average volume	Average rate	Net change	2017 vs. 2016 Increase (decrease) due to change in: Average volume	Average rate	Net change
Deposits						
In U.S. offices	$216	$1,754	$1,970	$147	$753	$900
In offices outside the U.S.[4]	162	897	1,059	64	323	387
Total	$378	$2,651	$3,029	$211	$1,076	$1,287
Federal funds purchased and securities loaned or sold under agreements to repurchase						
In U.S. offices	$115	$1,631	$1,746	$(45)	$595	$550
In offices outside the U.S.[4]	151	331	482	62	137	199
Total	$266	$1,962	$2,228	$17	$732	$749
Trading account liabilities[5]						
In U.S. offices	$49	$183	$232	$35	$103	$138
In offices outside the U.S.[4]	8	123	131	52	38	90
Total	$57	$306	$363	$87	$141	$228
Short-term borrowings[6]						
In U.S. offices	$105	$1,096	$1,201	$55	$426	$481
In offices outside the U.S.[4]	9	(60)	(51)	57	44	101
Total	$114	$1,036	$1,150	$112	$470	$582
Long-term debt						
In U.S. offices	$168	$836	$1,004	$424	$778	$1,202
In offices outside the U.S.[4]	11	(37)	(26)	(72)	30	(42)
Total	$179	$799	$978	$352	$808	$1,160
Total interest expense	$994	$6,754	$7,748	$779	$3,227	$4,006
Net interest revenue	$1,531	$(272)	$1,259	$880	$(1,261)	$(381)

(1) The taxable equivalent adjustment is related to the tax-exempt bond portfolio based on the U.S. federal statutory tax rate of 21% in 2018 and 35% in 2017 and 2016, and is included in this presentation.

(2) Rate/volume variance is allocated based on the percentage relationship of changes in volume and changes in rate to the total net change.

(3) Detailed average volume, Interest revenue and Interest expense exclude Discontinued operations. See Note 2 to the Consolidated Financial Statements.

(4) Changes in average rates reflect changes in prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.

(5) Interest expense on Trading account liabilities of ICG is reported as a reduction of Interest revenue. Interest revenue and Interest expense on cash collateral positions are reported in interest on Trading account assets and Trading account liabilities, respectively.

(6) Includes brokerage payables.

Market Risk of Trading Portfolios

Trading portfolios include positions resulting from market making activities, hedges of certain available-for-sale (AFS) debt securities, the CVA relating to derivative counterparties and all associated hedges, fair value option loans, hedges to the loan portfolio within capital markets origination within ICG.

The market risk of Citi's trading portfolios is monitored using a combination of quantitative and qualitative measures, including, but not limited to:

- factor sensitivities;
- value at risk (VAR); and
- stress testing.

Each trading portfolio across Citi's businesses has its own market risk limit framework encompassing these measures and other controls, including trading mandates, new product

approval, permitted product lists, and pre-trade approval for larger, more complex and less liquid transactions.

The following chart of total daily trading-related revenue (loss) captures trading volatility and shows the number of days in which revenues for Citi's trading businesses fell within particular ranges. Trading-related revenue includes trading, net interest and other revenue associated with Citi's trading businesses. It excludes DVA, FVA and CVA adjustments incurred due to changes in the credit quality of counterparties, as well as any associated hedges to that CVA. In addition, it excludes fees and other revenue associated with capital markets origination activities.

Trading-related revenues are driven by both customer flows and the changes in valuation of the trading inventory. As shown in the chart, positive trading-related revenue was achieved for 98.1% of the trading days in 2018.

Daily Trading-Related Revenue (Loss)[(1)]— Twelve Months ended December 31, 2018
In millions of dollars

(1) Reflects the effects of asymmetrical accounting for economic hedges of certain AFS debt securities. Specifically, the change in the fair value of hedging derivatives is included in Trading-related revenue, while the offsetting change in the fair value of hedged AFS debt securities is included in AOCI and not reflected above.

Factor Sensitivities

Factor sensitivities are expressed as the change in the value of a position for a defined change in a market risk factor, such as a change in the value of a U.S. Treasury bill for a one-basis-point change in interest rates. Citi's market risk management, within the Risk organization, works to ensure that factor sensitivities are calculated, monitored and limited for all material risks taken in the trading portfolios.

Value at Risk (VAR)

VAR estimates, at a 99% confidence level, the potential decline in the value of a position or a portfolio under normal market conditions assuming a one-day holding period. VAR statistics, which are based on historical data, can be materially different across firms due to differences in portfolio composition, differences in VAR methodologies and differences in model parameters. As a result, Citi believes VAR statistics can be used more effectively as indicators of trends in risk-taking within a firm, rather than as a basis for inferring differences in risk-taking across firms.

Citi uses a single, independently approved Monte Carlo simulation VAR model (see "VAR Model Review and Validation" below), which has been designed to capture material risk sensitivities (such as first- and second-order sensitivities of positions to changes in market prices) of various asset classes/risk types (such as interest rate, credit spread, foreign exchange, equity and commodity risks). Citi's VAR includes positions which are measured at fair value; it does not include investment securities classified as AFS or

HTM. For information on these securities, see Note 13 to the Consolidated Financial Statements.

Citi believes its VAR model is conservatively calibrated to incorporate fat-tail scaling and the greater of short-term (approximately the most recent month) and long-term (three years) market volatility. The Monte Carlo simulation involves approximately 450,000 market factors, making use of approximately 350,000 time series, with sensitivities updated daily, volatility parameters updated intra-month and correlation parameters updated monthly. The conservative features of the VAR calibration contribute an approximate 20% add-on to what would be a VAR estimated under the assumption of stable and perfectly, normally distributed markets.

As shown in the table below, Citi's average trading VAR modestly decreased in 2018 compared to the prior year, mainly due to a minor reduction in average credit spreads, partially offset by a minor increase in interest rate exposure within ICG. Additionally, among secondary factors with limited contribution to Citi's average VAR, equity risk increased mainly due to exposure changes in the Equities business, partially offset by a modest decrease in commodity exposures within ICG. The decrease in Citi's average trading and credit portfolio VAR from 2018 was in line with the decrease in average trading VAR, as the average incremental impact of the credit portfolio was unchanged.

Year-end and Average Trading VAR and Trading and Credit Portfolio VAR

In millions of dollars	December 31, 2018	2018 Average	December 31, 2017	2017 Average
Interest rate	$ 48	$ 60	$ 69	$ 58
Credit spread	55	47	54	48
Covariance adjustment[1]	(23)	(24)	(25)	(20)
Fully diversified interest rate and credit spread[2]	$ 80	$ 83	$ 98	$ 86
Foreign exchange	18	25	25	25
Equity	25	22	17	15
Commodity	23	19	17	22
Covariance adjustment[1]	(66)	(67)	(63)	(64)
Total trading VAR—all market risk factors, including general and specific risk (excluding credit portfolios)[2]	$ 80	$ 82	$ 94	$ 84
Specific risk-only component[3]	$ 4	$ 4	$ —	$ 1
Total trading VAR—general market risk factors only (excluding credit portfolios)	$ 76	$ 78	$ 94	$ 83
Incremental impact of the credit portfolio[4]	$ 18	$ 10	$ 11	$ 10

Total trading and credit portfolio VAR	$ 98	$ 92	$ 105	$ 94

(1) Covariance adjustment (also known as diversification benefit) equals the difference between the total VAR and the sum of the VARs tied to each individual risk type. The benefit reflects the fact that the risks within each and across risk types are not perfectly correlated and, consequently, the total VAR on a given day will be lower than the sum of the VARs relating to each individual risk type. The determination of the primary drivers of changes to the covariance adjustment is made by an examination of the impact of both model parameter and position changes.

(2) The total trading VAR includes mark-to-market and certain fair value option trading positions in ICG, with the exception of hedges to the loan portfolio, fair value option loans and all CVA exposures. Available-for-sale and accrual exposures are not included.

(3) The specific risk-only component represents the level of equity and fixed income issuer-specific risk embedded in VAR.

(4) The credit portfolio is composed of mark-to-market positions associated with non-trading business units, the CVA relating to derivative counterparties and all associated CVA hedges. FVA and DVA are not included. The credit portfolio also includes hedges to the loan portfolio, fair value option loans and hedges within capital markets origination in ICG.

The table below provides the range of market factor VARs associated with Citi's total trading VAR, inclusive of specific risk:

	2018		2017	
In millions of dollars	Low	High	Low	High
Interest rate	$34	$89	$29	$97
Credit spread	38	64	38	63
Fully diversified interest rate and credit spread	$59	$118	$59	$109
Foreign exchange	13	44	16	49
Equity	15	33	6	27
Commodity	13	27	13	31
Total trading	$56	$120	$58	$116
Total trading and credit portfolio	66	124	67	123

Note: No covariance adjustment can be inferred as the high and low for each market factor will be from different close-of-business dates.

The following table provides the VAR for ICG, excluding the CVA relating to derivative counterparties, hedges of CVA, fair value option loans and hedges to the loan portfolio:

In millions of dollars	Dec. 31, 2018
Total—all market risk factors, including general and specific risk	$ 79
Average—during year	$ 81
High—during year	120
Low—during year	55

VAR Model Review and Validation

Generally, Citi's VAR review and model validation process entails reviewing the model framework, major assumptions and implementation of the mathematical algorithm. In addition, as part of the model validation process, product specific back-testing on portfolios is periodically completed and reviewed with Citi's U.S. banking regulators. Furthermore, Regulatory VAR back-testing (as described below) is performed against buy-and-hold profit and loss on a monthly basis for multiple sub-portfolios across the organization (trading desk level, ICG business segment and Citigroup) and the results are shared with U.S. banking regulators.

Significant VAR model and assumption changes must be independently validated within Citi's risk management organization. This validation process includes a review by model validation group within Citi's Model Risk Management. In the event of significant model changes, parallel model runs are undertaken prior to implementation. In addition, significant model and assumption changes are subject to the periodic reviews and approval by Citi's U.S. banking regulators.

Citi uses the same independently validated VAR model for both Regulatory VAR and Risk Management VAR (i.e., total trading and total trading and credit portfolios VARs) and, as such, the model review and validation process for both purposes is as described above.

Regulatory VAR, which is calculated in accordance with Basel III, differs from Risk Management VAR due to the fact that certain positions included in Risk Management VAR are not eligible for market risk treatment in Regulatory VAR. The

composition of Risk Management VAR is discussed under "Value at Risk" above. The applicability of the VAR model for positions eligible for market risk treatment under U.S. regulatory capital rules is periodically reviewed and approved by Citi's U.S. banking regulators.

In accordance with Basel III, Regulatory VAR includes all trading book-covered positions and all foreign exchange and commodity exposures. Pursuant to Basel III, Regulatory VAR excludes positions that fail to meet the intent and ability to trade requirements and are therefore classified as non-trading book and categories of exposures that are

specifically excluded as covered positions. Regulatory VAR excludes CVA on derivative instruments and DVA on Citi's own fair value option liabilities. CVA hedges are excluded from Regulatory VAR and included in credit risk-weighted assets as computed under the Advanced Approaches for determining risk-weighted assets.

Regulatory VAR Back-Testing

In accordance with Basel III, Citi is required to perform back-testing to evaluate the effectiveness of its Regulatory VAR model. Regulatory VAR back-testing is the process in which the daily one-day VAR, at a 99% confidence interval, is compared to the buy-and-hold profit and loss (i.e., the profit and loss impact if the portfolio is held constant at the end of the day and re-priced the following day). Buy-and-hold profit and loss represents the daily mark-to-market profit and loss attributable to price movements in covered positions from the close of the previous business day. Buy-and-hold profit and loss excludes realized trading revenue, net interest, fees and commissions, intra-day trading profit and loss and changes in reserves.

Based on a 99% confidence level, Citi would expect two to three days in any one year where buy-and-hold losses exceeded the Regulatory VAR. Given the conservative calibration of Citi's VAR model (as a result of taking the greater of short- and long-term volatilities and fat-tail scaling of volatilities), Citi would expect fewer exceptions under normal and stable market conditions. Periods of unstable market conditions could increase the number of back-testing exceptions.

The following graph shows the daily buy-and-hold profit and loss associated with Citi's covered positions compared to

Citi's one-day Regulatory VAR during 2018. As of December 31, 2018, there was one back-testing exception observed for Citi's Regulatory VAR for the prior 12 months, due to market moves triggered by political events in Italy.

The difference between the 49.8% of days with buy-and-hold gains for Regulatory VAR back-testing and the 98.1% of days with trading, net interest and other revenue associated with Citi's trading businesses, shown in the histogram of daily trading-related revenue below, reflects, among other things, that a significant portion of Citi's trading-related revenue is not generated from daily price movements on these positions and exposures, as well as differences in the portfolio composition of Regulatory VAR and Risk Management VAR.

Regulatory Trading VAR and Associated Buy-and-Hold Profit and Loss[(1)]—12 Months ended December 31, 2018
In millions of dollars

Buy-and-hold profit and loss, as defined by the banking regulators under Basel III, represents the daily mark-to-market revenue movement attributable to the trading position from the close of the previous business day.

(1) Buy-and-hold profit and loss excludes realized trading revenue and net interest intra-day trading profit and loss on new and terminated trades, as well as changes in reserves. Therefore, it is not comparable to the trading-related revenue presented in the chart of daily trading-related revenue above.

Stress Testing

Citi performs market risk stress testing on a regular basis to estimate the impact of extreme market movements. It is performed on individual positions and trading portfolios, as well as in aggregate, inclusive of multiple trading portfolios. Citi's market risk management, after consultations with the businesses, develops both systemic and specific stress scenarios, reviews the output of periodic stress testing exercises, and uses the information to assess the ongoing appropriateness of exposure levels and limits. Citi uses two complementary approaches to market risk stress testing across all major risk factors (i.e., equity, foreign exchange, commodity, interest rate and credit spreads): top-down systemic stresses and bottom-up business-specific stresses. Systemic stresses are designed to quantify the potential impact of extreme market movements on an institution-wide basis, and are constructed using both historical periods of market stress and projections of adverse economic scenarios. Business-specific stresses are designed to probe the risks of particular portfolios and market segments, especially those risks that are not fully captured in VAR and systemic stresses.

The systemic stress scenarios and business-specific stress scenarios at Citi are used in several reports reviewed by senior management and also to calculate internal risk capital for trading market risk. In general, changes in market values are defined over a one-year horizon. For the most liquid positions and market factors, changes in market values are defined over a shorter two-month horizon. The limited set of positions and market factors whose market value changes are defined over a two-month horizon are those that in management's judgment have historically remained very liquid during financial crises, even as the trading liquidity of most other positions and market factors materially declined.

OPERATIONAL RISK

Overview

Operational risk is the risk of loss resulting from inadequate or failed internal processes, systems or human factors, or from external events. It includes risk of failing to comply with applicable laws and regulations, but excludes strategic risk. Operational risk includes the reputation and franchise risk associated with business practices or market conduct in which Citi is involved, as well as compliance, conduct and legal risks.

Operational risk is inherent in Citi's global business activities, as well as related support functions, and can result in losses arising from events associated with the following, among others:

- fraud, theft and unauthorized activity;
- employment practices and workplace environment;
- clients, products and business practices;
- physical assets and infrastructure; and
- execution, delivery and process management.

Citi manages operational risk consistent with the overall framework described in "Managing Global Risk—Overview" above. The Company's goal is to keep operational risk at appropriate levels relative to the characteristics of Citi's businesses, the markets in which it operates, its capital and liquidity and the competitive, economic and regulatory environment.

To anticipate, mitigate and control operational risk, Citi has established policies and a global framework for assessing, monitoring and communicating operational risks and the overall operating effectiveness of the internal control environment across Citigroup. As part of this framework, Citi has defined its operational risk appetite and has established a manager's control assessment (MCA) process (a process through which managers at Citi identify, monitor, measure, report on and manage risks and the related controls) to help managers self-assess significant operational risks and key controls and identify and address weaknesses in the design and/or operating effectiveness of internal controls that mitigate significant operational risks.

Each major business segment must implement an operational risk process consistent with the requirements of this framework. The process for operational risk management includes the following steps:

- identify and assess key operational risks;
- design controls to mitigate identified risks;
- establish key risk indicators;
- implement a process for early problem recognition and timely escalation;
- produce comprehensive operational risk reporting; and
- ensure that sufficient resources are available to actively improve the operational risk environment and mitigate emerging risks.

As new products and business activities are developed, processes are designed, modified or sourced through alternative means and operational risks are considered.

An Operational Risk Management Committee has been established to provide oversight for operational risk across Citigroup and to provide a forum to assess Citi's operational risk profile and ensure actions are taken so that Citi's operational risk exposure is actively managed consistent with Citi's risk appetite. The Committee seeks to ensure that these actions address the root causes that persistently lead to operational risk losses and create lasting solutions to minimize these losses. Members include Citi's Chief Risk Officer and Citi's Head of Operational Risk and senior members of their organizations. These members cover multiple dimensions of risk management and include business and regional Chief Risk Officers and senior operational risk managers.

In addition, risk management, including Operational Risk Management, works proactively with the businesses and other independent control functions to embed a strong operational risk management culture and framework across

Citi. Operational Risk Management engages with the businesses to ensure effective implementation of the Operational Risk Management framework by focusing on (i) identification, analysis and assessment of operational risks, (ii) effective challenge of key control issues and operational risks and (iii) anticipation and mitigation of operational risk events.

Information about the businesses' operational risk, historical operational risk losses and the control environment is reported by each major business segment and functional area. The information is summarized and reported to senior management, as well as to the Audit Committee of Citi's Board of Directors.

Operational risk is measured and assessed through risk capital. Projected operational risk losses under stress scenarios are also required as part of the Federal Reserve Board's CCAR process.

For additional information on Citi's operational risks, see "Risk Factors—Operational Risk" above.

Cybersecurity Risk

Cybersecurity risk is the business risk associated with the threat posed by a cyber attack, cyber breach or the failure to protect Citi's most vital business information assets or operations, resulting in a financial or reputational loss (for additional information, see the operational systems and cybersecurity risk factors in "Risk Factors—Operational Risks" above). With an evolving threat landscape, ever increasing sophistication of cybersecurity attacks and use of new technologies to conduct financial transactions, Citi and its clients, customers and third parties are and will continue to be at risk for cyber attacks and information security incidents. Citi recognizes the significance of these risks and, therefore, employs an intelligence-led strategy to prevent, detect, respond to, and recover from cyber attacks. Further, Citi actively participates in financial industry, government, and cross-sector knowledge sharing groups to enhance individual and collective cyber resilience.

Citi's technology and cybersecurity risk management program is built on three lines of defense. Citi's first line of defense includes its Information Protection Directorate and

Global Information Security group, which provides frontline business, operational and technical controls and capabilities to protect against cybersecurity risks, and to respond to cyber incidents and data breaches. Citi manages these threats through state-of-the-art Fusion Centers, which serve as central command for monitoring and coordinating responses to cyber threats. The enterprise information security team is responsible for infrastructure defense and security controls, performing vulnerability assessments and third-party information security assessments, employee awareness and training programs, and security incident management, in each case working in coordination with a network of information security officers that are embedded within the businesses and functions on a global basis.
Citi's Operational Risk Management-Technology and Cyber (ORM-T/C) and Independent Compliance Risk Management-Technology and Information Security (ICRM-T) groups serve as the second line of defense, and actively evaluate, anticipate and challenge Citi's risk mitigation practices and capabilities. Internal audit serves as the third line of defense and independently provides assurance on how effectively the organization as a whole manages cybersecurity risk. Citi's Information Security Risk Operating Committee (ISROC) has overall responsibility for information security across Citi, and facilitates communication, discussion, escalation and management of cyber risks across these functions.
Citi seeks to proactively identify and remediate technology and cybersecurity risks before they materialize as incidents that negatively affect business operations. Accordingly, the ORM-T/C team independently challenges and monitors capabilities in accordance with Citi's defined Technology and Cyber Risk Appetite statements. To address evolving cybersecurity risks and corresponding regulations, ORM-T/C also monitors cyber legal and regulatory requirements, defines and identifies emerging risks, executes strategic cyber threat assessments, performs new products and initiative reviews, performs data management risk oversight, and conducts cyber risk assurance reviews (inclusive of third-party assessments). In addition, ORM-T/C employs and develops tools and metrics that are both tailored to cybersecurity and technology, and aligned with Citi's overall operational risk management framework to effectively track, identify and manage risk.

COMPLIANCE RISK
Compliance risk is the risk to current or projected financial condition and resilience arising from violations of laws or regulations, or from nonconformance with prescribed practices, internal policies and procedures, or ethical standards. This risk exposes a bank to fines, civil money penalties, payment of damages, and the voiding of contracts. Compliance risk is not limited to risk from failure to comply with consumer protection laws; it encompasses the risk of noncompliance with all laws and regulations, as well as prudent ethical standards and contractual obligations. It also includes the exposure to litigation (known as legal risk) from all aspects of banking, traditional and nontraditional.

Compliance risk spans across all risk types in Citi's risk governance framework and the risk categories outlined in the Governance, Risk, Compliance (GRC) taxonomy. Citi seeks to operate with integrity, maintain strong ethical standards, and adhere to applicable policies, regulatory and legal requirements. Citi must maintain and execute a proactive Compliance Risk Management (CRM) Framework that is designed to change the way in which compliance risk is managed across Citi, with a view to fundamentally strengthen the compliance risk management culture across the lines of defense, taking into account Citi's risk governance framework and regulatory requirements. Independent Compliance Risk Management's (ICRM) primary objectives are to:

- Establish, manage and oversee the execution of the CRM Framework that facilitates enterprise-wide compliance with local, national or cross-border laws, rules or regulations, Citi's internal policies, standards and procedures and relevant standards of conduct;
- Support Citi's operations by assisting in the management of compliance risk across products, business lines, functions and geographies, supported by globally consistent systems and processes; and
- Drive and embed a risk culture of compliance, control and ethical conduct throughout Citi.

To anticipate, control and mitigate compliance risk, Citi has established the CRM Framework to achieve standardization and centralization of methodologies and processes, and to enable more consistent and comprehensive

execution of compliance risk management.

Citi has a commitment, as well as an obligation, to identify, assess, and mitigate compliance risks associated with its businesses and functions. ICRM is responsible for Citi's CRM Framework, while each business and global control functions are responsible for managing their compliance risks and ensure they are operating within the Compliance Risk Appetite.

Citi carries out its objectives and fulfills its responsibilities through the integrated CRM Framework, which is based upon four components: (i) governance and organization; (ii) compliance risk ethics and conduct risk; (iii) processes and activities; and (iv) resources and capabilities. To achieve this, Citi follows the following CRM Framework process steps:

- Identifying regulatory changes and performing the impact assessment, as well as capturing and monitoring adherence to existing regulatory requirements.
- Establishing, maintaining and adhering to policies, standards and procedures for the management of compliance risk, in accordance with policy governance requirements.
- Developing and providing training to support the effective execution of roles and responsibilities related to the identification, control, reporting and escalation of matters related to compliance risks.
- Self-assessment (e.g., Managers Control Assessment) of compliance risk.

- ICRM and other independent control functions are responsible for independently assessing the management of compliance risks.
- Independently testing and monitoring that Citi is operating within the Compliance Risk Appetite. Identifying instances of non-conformance with Laws, regulations, rules and breaches of internal policies.
- Escalating through the appropriate channels, which may include governance forums, the results of monitoring, testing, reporting or other oversight activities that may represent a violation of law, regulation, policy or other significant compliance risk and take reasonable action to see that the matter is appropriately identified, tracked and resolved, including through the issuance of corrective action plans against the first line of defense.

REPUTATIONAL RISK

Citi's reputation is a vital asset in building trust with its stakeholders and Citi is diligent in communicating its corporate values to its employees, customers and investors. To support this, Citi has defined a reputational risk appetite approach. Under this approach, each major business segment has implemented a risk appetite statement and related key indicators to monitor and address weaknesses that may result in significant reputational risks. The approach requires that each business segment or region escalate significant reputational risks that require review or mitigation through its business practice committee or equivalent.

The business practices committees are part of the governance infrastructure that Citi has in place to properly review business activities, sales practices, product design, perceived conflicts of interest and other potential franchise or reputational risks. These committees may also raise potential franchise, reputational or systemic risks for due consideration by the business practices committee at the corporate level. All of these committees, which are composed of Citi's most senior executives, provide the guidance necessary for Citi's business practices to meet the highest standards of professionalism, integrity and ethical behavior consistent with Citi's mission and value proposition. Further, the responsibility for maintaining Citi's reputation is shared by all employees, who are guided by Citi's code of conduct. Employees are expected to exercise sound judgment and common sense in decision and action. They are also expected to promptly and appropriately escalate all issues that present potential franchise, reputational and/or systemic risk.

STRATEGIC RISK

Overview

Citi senior management, led by Citi's CEO, is responsible for the development and execution of the strategy of the Company. Significant strategic actions are reviewed and approved by, or notified to, the Citigroup and Citibank Boards of Directors, as appropriate. The Citigroup Board of Directors holds an annual strategic meeting and annual regional strategic meetings, and receives business presentations at its regular meetings, in order to monitor management's execution of

Citi's strategy. At the business level, business heads are accountable for the interpretation and execution of the Company-wide strategy, as it applies to their area, including decisions on new business and product entries.

The management of strategic risk rests upon the foundational elements that include an annual financial operating plan encompassing all businesses, products and geographies and defined financial and operating targets, derived from the operating plan, which can be monitored throughout the year in order to assess strategic and operating performance. Strategic risk is monitored through various mechanisms, including regular updates to senior management and the Board of Directors on performance against the operating plan, quarterly business reviews between the Citi CEO and business and regional CEOs in which the performance and risks of each major business and region are discussed, ongoing reporting to senior management and executive management scorecards.

Potential Exit of U.K. from EU

As a result of a 2016 U.K. referendum, Citi has reorganized certain U.K. and EU operations and implemented contingency plans to address the U.K.'s potential exit from the EU, regardless of outcome. In addition, Citi has established a formal program with senior level sponsorship and governance to deliver a coordinated response to the

U.K.’s potential exit.

Until negotiations are finalized and an agreement is ratified, Citi continues to plan for a “hard” exit scenario as of March 29, 2019. Citi’s strategy focuses on providing continuity of services to its EU and U.K. clients with minimal disruption. Consequently, Citi has been migrating certain business activities to alternative legal entities and branches with appropriate regulatory permissions to carry out such activity and establishing required capabilities in the EU and U.K. Citi’s plans for a U.K. exit from the EU are well progressed for implementation and primarily cover:

- enhancement of Citi’s European bank in Ireland supported by its substantial European branch network to ensure business continuity for its EU clients;
- conversion of Citi’s banking subsidiary in Germany into Citi’s EU investment firm to support broker-dealer activities with EU clients;
- establishment of a new U.K. consumer bank to focus on servicing consumer business clients in the U.K.; and
- amendments to existing U.K. legal entities or branches, where required, to ensure continuity of services to U.K. and non-EU clients.

Citi continues to work closely with clients, regulators and other relevant stakeholders in execution of its plans to prepare for the U.K.’s potential exit from the EU. In addition, Citi continues to monitor macroeconomic scenarios and market events and has been undertaking stress testing to assess potential impacts on its businesses. For additional information, see “Risk Factors—Strategic Risk” above.

LIBOR Transition Risk

Citi recognizes that discontinuance of LIBOR, or any other IBOR-based rate, presents significant risks and challenges that could have an impact on its businesses globally (for information about the risks to Citi from discontinuation of LIBOR or any other benchmark, see “Risk Factors—Strategic Risk” above). Accordingly, in 2018, Citi established a LIBOR governance and implementation program that includes senior management involvement. Citi’s Asset and Liability Committee oversees the program, and includes reporting to the Citigroup Board of Directors. The program operates globally across Citi’s businesses and functions. In addition, Citi has developed an initial set of LIBOR transition action plans and associated roadmap under nine key workstreams: transition strategy and risk management; customer management; internal communications and training; financial exposures and risk management; regulatory and industry engagement; operations and technology; finance, tax and treasury; legal and contract management; and product management. Citi has also been participating in a number of working groups formed by global regulators, including the Alternative Reference Rates Committee convened by the Federal Reserve Board. These working groups have been established to promote and advance development of alternative reference rates and to identify and address potential challenges from any transition to such rates.

Country Risk

Top 25 Country Exposures

The following table presents Citi's top 25 exposures by country (excluding the U.S.) as of December 31, 2018. The total exposure as of December 31, 2018 to the top 25 countries disclosed below, in combination with the U.S., would represent approximately 96% of Citi's exposure to all countries.

For purposes of the table, loan amounts are reflected in the country where the loan is booked, which is generally based on the domicile of the borrower. For example, a loan to a Chinese subsidiary of a Switzerland-based corporation will generally be categorized as a loan in China. In addition, Citi has developed regional booking centers in certain countries,

most significantly in the United Kingdom (U.K.) and Ireland, in order to more efficiently serve its corporate customers. As an example, with respect to the U.K., only 27% of corporate loans presented in the table below are to U.K. domiciled entities (27% for unfunded commitments), with the balance of the loans predominately to European domiciled counterparties. Approximately 83% of the total U.K. funded loans and 91% of the total U.K. unfunded commitments were investment grade as of December 31, 2018. Trading account assets and investment securities are generally categorized based on the domicile of the issuer of the security of the underlying reference entity. For additional information on the assets included in the table, see the footnotes to the table below.

In billions of U.S. dollars	ICG loans[1]	GCB loans	Other funded[2]	Unfunded[3]	Net MTM on derivatives/repos	Total hedges (on loans and CVA)[4]	Investment securities[5]	Trading account assets[6]	Total as of 4Q18	Total as of 3Q18	Total as of 4Q17	Total as a % of Citi as of 4Q18
United Kingdom	$ 40.4	$ —	$ 4.7	$ 56.5	$ 12.8	$ (3.7)	$ 4.0	$ (3.1)	$ 111.6	$ 123.7	$ 113.2	6.9 %
Mexico	9.5	25.3	0.3	7.1	0.8	(0.6)	12.4	4.8	59.6	61.9	58.4	3.7
Hong Kong	16.5	12.6	0.8	8.4	2.4	(0.2)	7.1	0.5	48.1	45.9	42.2	3.0
Singapore	12.8	12.4	0.3	4.7	1.3	(0.2)	7.8	1.6	40.7	41.0	41.4	2.5
Korea	1.9	18.6	0.2	3.0	1.2	(0.5)	8.6	0.8	33.8	33.7	35.3	2.1
Ireland	13.7	—	1.4	17.8	0.4	—	—	0.4	33.7	31.1	31.9	2.1
India	4.4	7.0	0.6	4.9	2.4	(0.8)	9.7	2.0	30.2	27.2	30.3	1.9
Brazil	12.7	—	—	2.7	4.6	(1.0)	3.3	3.7	26.0	25.9	24.7	1.6
Australia	5.5	9.9	0.1	6.3	1.4	(0.4)	1.5	(0.8)	23.5	24.1	25.2	1.5
China	5.9	4.6	0.4	1.6	1.0	(0.5)	4.7	0.3	18.0	18.8	19.4	1.1
Japan	2.7	—	0.1	2.6	3.4	(1.3)	5.8	4.3	17.6	18.4	17.7	1.1
Taiwan	4.7	9.0	0.1	1.0	0.3	(0.1)	1.5	0.9	17.4	17.8	17.3	1.1
Germany	0.2	—	—	4.5	3.5	(3.6)	8.9	3.9	17.4	19.7	19.1	1.1
Canada	2.2	0.6	0.3	6.9	2.6	(0.3)	3.1	0.6	16.0	16.4	16.3	1.0
Poland	3.7	1.9	0.1	3.6	0.1	(0.1)	3.7	0.2	13.2	14.4	14.0	0.8
Jersey	6.9	—	0.3	3.2	—	—	—	—	10.4	10.3	4.8	0.6
Malaysia	1.8	4.7	0.3	1.2	0.1	(0.1)	1.6	0.4	10.0	9.6	10.0	0.6
United Arab Emirates	4.6	1.5	0.1	3.3	0.2	(0.1)	—	—	9.6	9.8	7.0	0.6
Thailand	0.8	2.6	0.1	1.5	0.1	—	1.7	0.6	7.4	7.2	7.4	0.5

Indonesia	2.5	1.0	—	1.5	—	(0.1)	1.2	0.2	6.3	5.8	6.3	0.4
Philippines	0.7	1.3	0.1	0.4	0.9	(0.1)	1.5	0.5	5.3	4.9	3.8	0.3
Luxembourg	0.1	—	—	—	0.4	(0.3)	4.1	0.6	4.9	5.1	5.4	0.3
Russia	1.6	0.8	—	1.1	0.8	(0.1)	0.6	(0.2)	4.6	4.1	6.6	0.3
South Africa	1.7	—	—	1.2	0.2	(0.1)	1.4	0.1	4.5	5.0	4.3	0.3
Italy	0.2	—	—	2.2	4.5	(4.4)	0.1	1.1	3.7	3.7	3.8	0.2
											Total	35.6%

(1) ICG loans reflect funded corporate loans and private bank loans, net of unearned income. As of December 31, 2018, private bank loans in the table above totaled $24.6 billion, concentrated in Hong Kong ($7.3 billion), Singapore ($6.4 billion) and the U.K. ($5.9 billion).

(2) Other funded includes other direct exposure such as accounts receivable, loans HFS, other loans in Corporate/Other and investments accounted for under the equity method.

(3) Unfunded exposure includes unfunded corporate lending commitments, letters of credit and other contingencies.

(4) Net mark-to-market counterparty risk on OTC derivatives and securities lending/borrowing transactions (repos). Exposures are shown net of collateral and inclusive of CVA. Includes margin loans.

(5) Investment securities include securities available-for-sale, recorded at fair market value, and securities held-to-maturity, recorded at historical cost.

(6) Trading account assets are shown on a net basis and include issuer risk on cash products and derivative exposure where the underlying reference entity/issuer is located in that country.

Venezuela

Citi continues to monitor the political and economic environment and uncertainties in Venezuela. As of December 31, 2018, Citi's net investment in its on-shore Venezuelan operations was approximately $40 million. In addition, in early 2015, the Central Bank of Venezuela (BCV) sold gold held at the Bank of England to a Citi entity in the U.K., giving Citi ownership and full legal title to the gold for $1.6 billion. Simultaneously, the BCV entered into forward purchase agreements (collectively, the Agreements) with Citi, requiring the BCV to purchase the same quantity of gold from Citi on predetermined dates. The next such date will be in March 2019 at which time the BCV will be required to purchase a significant amount of gold from Citi under the terms of the Agreements. Citi believes it is protected against market and credit risk related to the Agreements. The Agreements were accounted for as a financing on Citi's books under ASC 470-40.

FFIEC—Cross-Border Claims on Third Parties and Local Country Assets

Citi's cross-border disclosures are based on the country exposure bank regulatory reporting guidelines of the Federal Financial Institutions Examination Council (FFIEC). The following summarizes some of the FFIEC key reporting guidelines:

- Amounts are based on the domicile of the ultimate obligor, counterparty, collateral (only including qualifying liquid collateral), issuer or guarantor, as applicable (e.g., a security recorded by a Citi U.S. entity but issued by the U.K. government is considered U.K. exposure; a loan recorded by a Citi Mexico entity to a customer domiciled in Mexico where the underlying collateral is held in Germany is considered German exposure).
- Amounts do not consider the benefit of collateral received for secured financing transactions (i.e., repurchase agreements, reverse repurchase agreements and securities loaned and borrowed) and are reported based on notional amounts.
- Netting of derivative receivables and payables, reported at fair value, is permitted, but only under a legally binding netting agreement with the same specific counterparty, and does not include the benefit of margin received or hedges.
- Credit default swaps (CDS) are included based on the gross notional amount sold and purchased and do not include any offsetting CDS on the same underlying entity.
- Loans are reported without the benefit of hedges.

Given the requirements noted above, Citi's FFIEC cross-border exposures and total outstandings tend to fluctuate, in some cases, significantly, from period to period. As an example, because total outstandings under FFIEC guidelines do not include the benefit of margin or hedges, market volatility in interest rates, foreign exchange rates and credit spreads may cause significant fluctuations in the level of total outstandings, all else being equal.

The tables below show each country whose total outstandings exceeded 0.75% of total Citigroup assets:

December 31, 2018

Cross-border claims on third parties and local country assets

In billions of U.S. dollars	Banks (a)	Public (a)	NBFIs (a)	Other (corporate and households)[1] (a)	Trading assets[2] (included in (a))	Short-term claims[2] (included in (a))	Total outstanding (sum of (a))	Commitments[3] and guarantees[4]	Credit derivatives purchased[5]	Credit derivatives sold[5]
United Kingdom	$14.6	$24.3	$35.7	$ 21.6	$ 12.3	$ 67.8	$ 96.2	$ 25.1	$ 74.3	$ 76.4
Cayman Islands	—	—	81.6	9.2	5.4	62.5	90.8	5.0	—	—
Japan	31.4	28.8	8.4	7.8	13.6	40.7	76.4	4.0	19.9	18.3
Mexico	2.4	24.0	7.4	35.8	6.0	29.1	69.6	20.2	7.3	7.6
Germany	6.3	46.4	7.5	7.6	6.6	50.4	67.8	10.7	51.3	50.2
France	12.4	8.5	30.7	5.6	9.1	49.5	57.2	30.7	59.9	58.5
Korea South	1.5	17.8	3.0	22.6	1.8	33.2	44.9	12.1	12.2	12.2
Singapore	1.4	22.5	4.4	13.4	1.7	31.5	41.7	11.4	1.9	1.9
India	3.3	12.7	3.3	15.3	4.3	22.5	34.6	9.7	2.5	2.0
Hong Kong	0.9	11.2	3.2	16.9	3.9	27.5	32.2	14.6	2.2	2.2
China	5.0	11.3	3.0	12.3	4.5	20.6	31.6	4.2	15.6	14.6
Australia	3.1	7.8	4.8	13.4	7.1	14.4	29.1	12.1	10.6	10.5
Brazil	3.8	10.4	1.4	10.9	5.0	16.8	26.5	2.6	8.4	8.1
Taiwan	0.7	7.4	3.2	12.6	1.6	18.7	23.9	13.0	0.1	0.1
Netherlands	6.8	9.0	3.2	4.7	3.7	14.7	23.7	8.6	28.4	28.3
Canada	3.2	4.0	9.9	5.2	2.8	15.5	22.3	13.8	5.3	6.2
Switzerland	1.4	13.9	1.1	3.6	1.6	5.1	20.0	6.0	19.7	19.6
Italy	3.4	11.0	0.8	1.6	7.9	10.5	16.8	2.5	51.3	51.5

December 31, 2017

Cross-border claims on third parties and local country assets

In billions of U.S. dollars	Banks (a)	Public (a)	NBFIs (a)	Other (corporate and households)[1] (a)	Trading assets[2] (included in (a))	Short-term claims[2] (included in (a))	Total outstanding (sum of (a))	Commitments[3] and guarantees[4]	Credit derivatives purchased[5]	Credit derivatives sold[5]
United Kingdom	$15.4	$23.0	$33.9	$ 19.7	$ 13.5	$ 62.7	$ 92.0	$ 31.3	$ 74.9	$ 77.1
Cayman Islands	—	—	62.9	8.5	4.3	45.3	71.4	4.4	—	—
Germany	7.1	38.3	8.9	11.7	10.2	45.5	66.0	12.4	54.6	54.1
Japan	25.4	26.4	5.4	8.5	13.3	49.6	65.7	6.3	22.9	22.3
Mexico	6.0	18.5	7.9	33.0	4.7	42.8	65.4	19.6	6.4	6.2
France	12.6	5.1	20.9	6.3	8.7	37.4	44.9	23.9	59.8	60.6
South Korea	2.8	15.8	1.9	24.4	1.4	38.5	44.9	17.3	14.4	12.4
Singapore	1.9	22.4	4.3	14.7	0.4	33.2	43.3	11.5	1.8	1.8
India	6.0	12.7	4.4	16.0	5.6	25.8	39.1	9.3	2.5	2.1
Australia	4.7	8.1	4.7	14.2	7.3	18.6	31.7	13.3	13.2	13.3
China	5.2	9.2	3.2	13.8	3.6	24.5	31.4	4.5	14.2	14.5
Hong Kong	0.7	9.8	3.0	15.8	5.0	23.6	29.3	13.5	2.5	2.3
Brazil	3.7	11.4	0.9	10.6	5.5	17.3	26.6	2.2	10.6	9.6
Netherlands	7.2	9.5	4.7	6.1	4.1	15.9	27.5	10.5	27.3	27.8
Taiwan	0.9	6.1	2.2	13.3	2.7	16.9	22.5	14.0	0.1	0.1
Canada	4.2	4.7	7.6	5.0	2.9	11.1	21.5	14.0	5.4	6.2

Switzerland	1.5	13.6	1.3	4.3	1.7	17.2	20.7	5.8	19.3	19.4
Italy	3.2	11.3	0.6	1.3	7.5	9.4	16.4	2.8	59.6	58.4

(1) Non-bank financial institutions.
(2) Included in total outstanding.
(3) Total outstanding includes cross-border claims on third parties, as well as local country assets. Cross-border claims on third parties include cross-border loans, securities, deposits with banks and other monetary assets, as well as net revaluation gains on foreign exchange and derivative products.
(4) Commitments (not included in total outstanding) include legally binding cross-border letters of credit and other commitments and contingencies as defined by the FFIEC guidelines. The FFIEC definition of commitments includes commitments to local residents to be funded with local currency liabilities originated within the country.
(5) Credit Default Swaps (CDS) are not included in total outstanding.

SIGNIFICANT ACCOUNTING POLICIES AND SIGNIFICANT ESTIMATES

This section contains a summary of Citi's most significant accounting policies and accounting standards that have been issued, but are not yet effective. Note 1 to the Consolidated Financial Statements contains a summary of Citigroup's significant accounting policies, including a discussion of recently adopted accounting pronouncements. These policies, as well as estimates made by management, are integral to the presentation of Citi's results of operations and financial condition. While all of these policies require a certain level of management judgment and estimates, this section highlights and discusses the significant accounting policies that require management to make highly difficult, complex or subjective judgments and estimates at times regarding matters that are inherently uncertain and susceptible to change (see also "Risk Factors—Operational Risks" above). Management has discussed each of these significant accounting policies, the related estimates and its judgments with the Audit Committee of the Citigroup Board of Directors.

Valuations of Financial Instruments

Citigroup holds debt and equity securities, derivatives, retained interests in securitizations, investments in private equity and other financial instruments. Substantially all of these assets and liabilities are reflected at fair value on Citi's Consolidated Balance Sheet.

Citi purchases securities under agreements to resell (reverse repos) and sells securities under agreements to repurchase (repos), a majority of which are carried at fair value. In addition, certain loans, short-term borrowings, long-term debt and deposits, as well as certain securities borrowed and loaned positions that are collateralized with cash, are carried at fair value. Citigroup holds its investments, trading assets and liabilities, and resale and repurchase agreements on the Consolidated Balance Sheet to meet customer needs and to manage liquidity needs, interest rate risks and private equity investing.

When available, Citi generally uses quoted market prices to determine fair value and classifies such items within Level 1 of the fair value hierarchy established under ASC 820-10, Fair Value Measurement. If quoted market prices are not available, fair value is based upon internally developed valuation models that use, where possible, current market-based or independently sourced market parameters, such as interest rates, currency rates and option volatilities. Such models are often based on a discounted cash flow analysis. In addition, items valued using such internally generated valuation techniques are classified according to the lowest level input or value driver that is significant to the valuation. Thus, an item may be classified under the fair value hierarchy as Level 3 even though there may be some significant inputs that are readily observable.

Citi is required to exercise subjective judgments relating to the applicability and functionality of internal valuation models, the significance of inputs or value drivers to the valuation of an instrument and the degree of illiquidity and subsequent lack of observability in certain markets. These

judgments have the potential to impact the Company's financial performance for instruments where the changes in fair value are recognized in either the Consolidated Statement of Income or in AOCI.

Moreover, for certain investments, decreases in fair value are only recognized in earnings in the Consolidated Statement of Income if such decreases are judged to be an other-than-temporary impairment (OTTI). Adjudicating the temporary nature of fair value impairments is also inherently judgmental.

The fair value of financial instruments incorporates the effects of Citi's own credit risk and the market view of counterparty credit risk, the quantification of which is also complex and judgmental. For additional information on Citi's fair value analysis, see Notes 1, 6, 24 and 25 to the Consolidated Financial Statements.

Allowance for Credit Losses

Management provides reserves for an estimate of probable losses inherent in the funded loan portfolio and in unfunded loan commitments and standby letters of credit on the Consolidated Balance Sheet in the Allowance for loan losses and in Other liabilities, respectively.

Estimates of these probable losses are based upon (i) Citigroup's internal system of credit-risk ratings that are analogous to the risk ratings of the major credit rating agencies and (ii) historical default and loss data, including rating agency information regarding default rates from 1983 to 2017 and internal data dating to the early 1970s on severity of losses in the event of default. Adjustments may be made to this data, including (i) statistically calculated estimates to cover the historical fluctuation of the default rates over the credit cycle, the historical variability of loss severity among defaulted loans and the degree to which there are large obligor concentrations in the global portfolio and (ii) adjustments made for specifically known items, such as current environmental factors and credit trends.

In addition, representatives from both the risk management and finance staffs who cover business areas with delinquency-managed portfolios containing smaller balance homogeneous loans present their recommended reserve balances based upon leading credit indicators, including loan delinquencies and changes in portfolio size, as well as economic trends, including housing prices, unemployment and GDP. This methodology is applied separately for each individual product within each geographic region in which these portfolios exist.

This evaluation process is subject to numerous estimates and judgments. The frequency of default, risk ratings, loss recovery rates, the size and diversity of individual large credits and the ability of borrowers with foreign currency obligations to obtain the foreign currency necessary for orderly debt servicing, among other things, are all taken into account during this review. Changes in these estimates could have a direct impact on Citi's credit costs and the allowance in any period.

For a further description of the loan loss reserve and related accounts, see Notes 1 and 15 to the Consolidated Financial Statements.

Goodwill

Citi tests goodwill for impairment annually on July 1 (the annual test) and interim assessments between annual tests if an event occurs or circumstances change that would more-likely-than-not reduce the fair value of a reporting unit below its carrying amount, such as a significant adverse change in the business climate, a decision to sell or dispose of all or a significant portion of a reporting unit or a significant decline in Citi's stock price. During 2018, the annual test was performed, which resulted in no goodwill impairment as described in Note 16 to the Consolidated Financial Statements.

As of December 31, 2018, Citigroup's activities are conducted through the Global Consumer Banking and Institutional Clients Group business segments and Corporate/Other. Goodwill impairment testing is performed at the level below the business segment (referred to as a reporting unit).

Citi utilizes allocated equity as a proxy for the carrying value of its reporting units for purposes of goodwill impairment testing. The allocated equity in the reporting units is determined based on the capital the business would require if it were operating as a standalone entity, incorporating sufficient capital to be in compliance with both current and expected regulatory capital requirements, including capital for specifically identified goodwill and intangible assets. The capital allocated to the businesses is incorporated into the annual budget process, which is approved by Citi's Board of Directors.

Goodwill impairment testing involves management judgment, requiring an assessment of whether the carrying value of the reporting unit can be supported by the fair value of the reporting unit using widely accepted valuation techniques, such as the market approach (earnings multiples and/or transaction multiples) and/or the income approach (discounted cash flow (DCF) method). In applying these methodologies, Citi utilizes a number of factors, including actual operating results, future business plans, economic projections and market data.

Similar to 2017, Citigroup engaged an independent valuation specialist in 2018 to assist in Citi's valuation for all the reporting units with goodwill balances, employing both the market approach and the DCF method. The resulting fair values were relatively consistent and appropriate weighting was given to outputs from both methods.

The DCF method utilized at the time of each impairment test used discount rates that Citi believes adequately reflected the risk and uncertainty in the financial markets in the internally generated cash flow projections. The DCF method employs a capital asset pricing model in estimating the discount rate.

Since none of the Company's reporting units are publicly traded, individual reporting unit fair value determinations cannot be directly correlated to Citigroup's common stock price. The sum of the fair values of the

reporting units exceeded the overall market capitalization of Citi as of July 1, 2018. However, Citi believes that it is not meaningful to reconcile the sum of the fair values of the Company's reporting units to its market capitalization due to several factors. The market capitalization of Citigroup reflects the execution risk in a transaction involving Citigroup due to its size. However, the individual reporting units' fair values are not subject to the same level of execution risk nor a business model that is perceived to be as complex. In addition, the market capitalization of Citigroup does not include consideration of the individual reporting unit's control premium.

See Notes 1 and 16 to the Consolidated Financial Statements for additional information on goodwill, including the changes in the goodwill balance year-over-year and the reporting units' goodwill balances as of December 31, 2018.

Income Taxes

Overview

Citi is subject to the income tax laws of the U.S., its states and local municipalities and the non-U.S. jurisdictions in which Citi operates. These tax laws are complex and are subject to differing interpretations by the taxpayer and the relevant governmental taxing authorities. Disputes over interpretations of the tax laws may be subject to review and adjudication by the court systems of the various tax jurisdictions or may be settled with the taxing authority upon audit.

In establishing a provision for income tax expense, Citi must make judgments and interpretations about the application of these inherently complex tax laws. Citi must also make estimates about when in the future certain items will affect taxable income in the various tax jurisdictions, both domestic and foreign. Deferred taxes are recorded for the future consequences of events that have been recognized in the financial statements or tax returns, based upon enacted tax laws and rates. Deferred tax assets (DTAs) are recognized subject to management's judgment that realization is more-likely-than-not.

On December 22, 2017, the President signed the Tax Cuts and Jobs Act (Tax Reform), reflecting changes to U.S. corporate taxation, including a lower statutory tax rate of 21%, a quasi-territorial regime and a deemed repatriation of all accumulated earnings and profits of foreign subsidiaries. The new law was generally effective January 1, 2018.

Citi recorded a one-time, non-cash charge to continuing operations of $22.6 billion in the fourth quarter of 2017, composed of (i) a $12.4 billion remeasurement due to the reduction of the U.S. corporate tax rate and the change to a "quasi-territorial tax system," (ii) a $7.9 billion valuation allowance against Citi's FTC carry-forwards and its U.S. residual DTAs related to its non-U.S. branches and (iii) a $2.3 billion reduction in Citi's FTC carry-forwards related to the deemed repatriation of undistributed earnings of non-U.S. subsidiaries. Of this one-time charge, $16.4 billion was considered provisional pursuant to Staff Accounting Bulletin (SAB) 118.

Citi completed its accounting for Tax Reform under SAB 118 during the fourth quarter of 2018 and recorded a one-time, non-cash tax benefit of $94 million in Corporate/Other, related to amounts that were considered provisional pursuant to SAB 118.

The table below details the fourth quarter of 2018 changes to Citi's provisional impact from Tax Reform.

Provisional Impact of Tax Reform

In billions of dollars	Provisional amounts included in the 2017 Form 10-K	SAB 118 impact to fourth quarter of 2018 tax provision
Quasi-territorial tax system	$ 6.2	$ 0.2
Valuation allowance	7.9	(1.2)
Deemed repatriation	2.3	0.9
Total of provisional items	$ 16.4	$ (0.1)

Citi has an overall domestic loss (ODL) of approximately $47 billion. An ODL allows a company to recharacterize domestic income as income from sources outside the U.S., which enables a taxpayer to use FTC carry-forwards and FTCs generated in future years, assuming the generation of sufficient U.S. taxed income. The change in Tax Reform to allow a taxpayer to elect to recharacterize up to 100% of its domestic source income as non-U.S. source income (up from 50%) is not expected to materially impact the valuation allowance.

As a result of Tax Reform, beginning in 2018, Citi is taxed on income generated by its U.S. operations at a federal tax rate of 21%. The effect on its state tax rate is dependent upon how and when the individual states choose to or automatically adopt the various new provisions of the U.S. Internal Revenue Code.

Citi's non-U.S. branches and subsidiaries are subject to tax at their local tax rates. While non-U.S. branches continue to be subject to U.S. taxation, Citi expects no material residual U.S. tax on such earnings since its overall non-U.S. branch tax rate is in excess of 21%. With respect to non-U.S. subsidiaries, dividends from these subsidiaries will be excluded from U.S. taxation. While the majority of Citi's non-U.S. subsidiary earnings are classified as Global Intangible Low Taxed Income (GILTI), Citi similarly expects no material residual U.S. tax on such earnings based on its non-U.S. subsidiaries' local tax rates, which exceed, on average, the GILTI tax rate. Finally, Citi does not expect the Base Erosion Anti-Abuse Tax (BEAT) to affect its tax provision. For additional information on the BEAT, see "Risk Factors—Strategic Risks" above.

DTAs

At December 31, 2018, Citi had net DTAs of $22.9 billion. In the fourth quarter of 2018, Citi's DTAs decreased $0.1 billion, driven primarily by gains in AOCI. On a full-year basis, Citi's DTAs increased $0.4 billion from $22.5 billion at December 31, 2017. The increase in total DTAs year-over-year was primarily due to the accounting change for Intra-Entity Transfers of Assets under ASU 2016-16.

Citi's total valuation allowance at December 31, 2018 was $9.3 billion, a decrease of $0.1 billion from $9.4 billion at December 31, 2017. The decrease was driven by a reduction due to the SAB 118 adjustment, partially offset by the 2018 change in DTAs relating to Citi's non-U.S. branches.

Citi's valuation allowance of $6.0 billion against FTC carry-forwards increased by $0.3 billion in 2018. The increase primarily relates to its non-U.S. branches, partially offset by SAB 118 adjustments. Citi expects that the absolute amount will increase in future years as it generates additional FTCs relating to the higher overall local tax rate of its non-U.S. branches, reduced by the statutory expiration of FTC carry-forwards. With respect to the portion of the valuation allowance established on Citi's FTC carry-forwards that are available for use in the general basket, changes

in the amount of earnings from sources outside the U.S. could alter the amount of valuation allowance that is eventually needed against such FTCs.

Recognized FTCs comprised approximately $6.8 billion of Citi's DTAs as of December 31, 2018, compared to approximately $7.6 billion as of December 31, 2017. The decrease in FTCs year-over-year was primarily due to adjustments under SAB 118 and current-year usage. The FTC carry-forward periods represent the most time-sensitive component of Citi's DTAs.

Citi believes the U.S. federal and New York State and City net operating loss carry-forward period of 20 years provides enough time to fully utilize the net DTAs pertaining to the existing net operating loss carry-forwards. This is due to Citi's forecast of sufficient U.S. taxable income and the continued taxation of Citi's non-U.S. income by New York State and City. Although realization is not assured, Citi believes that the realization of the recognized net DTAs of

$22.9 billion at December 31, 2018 is more-likely-than-not, based upon management's expectations as to future taxable income in the jurisdictions in which the DTAs arise, as well as available tax planning strategies (as defined in ASC Topic 740, Income Taxes). Citi has concluded that it has the necessary positive evidence to support the realization of its net DTAs after taking its valuation allowances into consideration.

For additional information on Citi's income taxes, including its income tax provision, tax assets and liabilities and a tabular summary of Citi's net DTAs balance as of December 31, 2018 (including the FTCs and applicable expiration dates of the FTCs), see Note 9 to the Consolidated Financial Statements. For additional discussion of the potential impact to Citi's DTAs that could arise from Tax Reform, see "Risk Factors—Strategic Risks" above.

2017 Impact of Tax Reform

The table below discloses the as-reported GAAP results for 2018 and 2017, as well as the 2017 adjusted results excluding the one-time 2017 impact of Tax Reform. The table below does not reflect any adjustment to 2018 results.

In millions of dollars, except per share amounts and as otherwise noted	2018 as reported[1]	2017 as reported	2017 one-time impact of Tax Reform	2017 adjusted results[2]	2018 increase (decrease) vs. 2017 ex-Tax Reform	
					$ Change	% Change
Net income (loss)	$18,045	$(6,798)	$(22,594)	$15,796	$2,249	14 %
Diluted earnings per share:						
Income (loss) from continuing operations	6.69	(2.94)	(8.31)	5.37	1.32	25
Net income (loss)	6.68	(2.98)	(8.31)	5.33	1.35	25
Effective tax rate	22.8 %	129.1 %	(9,930) bps	29.8 %		(700) bps
Global Consumer Banking—Net income	$5,755	$3,869	$(750)	$4,619	$1,136	25 %
North America GCB—Net income	3,340	1,991	(750)	2,741	599	22
Institutional Clients Group—Net income	12,183	9,009	(2,000)	11,009	1,174	11
Corporate/Other—Net income (loss)	107	(19,676)	(19,844)	168	(61)	(36)
Performance and other metrics:						
Return on average assets	0.94 %	(0.36)%	(120) bps	0.84 %		10 bps
Return on average common stockholders' equity	9.4	(3.9)	(1,090)	7.0		240
Return on average total stockholders' equity	9.1	(3.0)	(1,000)	7.0		210
Return on average tangible common equity	11.0	(4.6)	(1,270)	8.1		290
Dividend payout ratio	23.1	(32.2)	(5,020)	18.0		510
Total payout ratio	109.1	(213.9)	(33,140)	117.5		840

(1) 2018 includes the one-time benefit of $94 million, due to the finalization of the provisional component of the impact based on Citi's analysis as well as additional guidance received from the U.S. Treasury Department related to Tax Reform, which impacted the tax line within Corporate/Other.

(2) 2017 excludes the one-time impact of Tax Reform.

Litigation Accruals

See the discussion in Note 27 to the Consolidated Financial Statements for information regarding Citi's policies on establishing accruals for litigation and regulatory contingencies.

FUTURE APPLICATION OF ACCOUNTING STANDARDS

Accounting for Financial Instruments—Credit Losses

In June 2016, the Financial Accounting Standards Board (FASB) issued ASU No. 2016-13, Financial Instruments—Credit Losses (Topic 326). The ASU introduces a new credit loss methodology, the Current Expected Credit Losses (CECL) methodology, which requires earlier recognition of credit losses, while also providing additional transparency about credit risk.

The CECL methodology utilizes a lifetime "expected credit loss" measurement objective for the recognition of credit losses for loans, held-to-maturity debt securities and other receivables measured at amortized cost at the time the financial asset is originated or acquired. The allowance for credit losses is adjusted each period for changes in expected lifetime credit losses. This methodology replaces the multiple existing impairment methods in current GAAP, which generally require that a loss be incurred before it is recognized. Within the life cycle of a loan or other financial asset, the ASU will generally result in the earlier recognition of the provision for credit losses and the related allowance for credit losses than current practice. For available-for-sale debt securities that Citi intends to hold and where fair value is less than cost, credit-related impairment, if any, will be recognized through an allowance for credit losses and adjusted each period for changes in credit risk.

The CECL methodology represents a significant change from existing GAAP and may result in material changes to the Company's accounting for financial instruments. The Company is evaluating the effect that ASU 2016-13 will have on its Consolidated Financial Statements and related disclosures. The impact of the ASU will depend upon the state of the economy, forecasted macroeconomic conditions and Citi's portfolios at the date of adoption. Based on a preliminary analysis performed in the fourth quarter of 2018 and forecasts of macroeconomic conditions and exposures at that time, the overall impact was estimated to be an approximate 10% to 20% increase in expected credit loss reserves. The ASU will be effective for Citi as of January 1, 2020. This increase would be reflected as a decrease to opening Retained earnings, net of income taxes, at January 1, 2020.

Implementation efforts are underway, including model development, fulfillment of additional data needs for new disclosures and reporting requirements, and drafting of accounting policies. Substantial progress has been made in model development. Model validations and user acceptance testing commenced in the first quarter of 2019, with parallel runs to begin in the third quarter of 2019. The Company intends to utilize a single macroeconomic scenario in estimating expected credit losses. Reasonable and supportable forecast periods and methods to revert to historical averages to arrive at lifetime expected credit losses vary by product.

For additional information on regulatory capital treatment, see "Capital Resources—Regulatory Capital Treatment—Implementation and Transition of the Current Expected Credit Losses (CECL) Methodology" above.

Lease Accounting

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), which is intended to increase transparency and comparability of accounting for lease transactions. The ASU will require lessees to recognize leases on the balance sheet as right-of-use assets and lease liabilities and will require both quantitative and qualitative disclosures regarding key information about leasing arrangements. Lessor accounting is largely unchanged. On January 1, 2019, the Company adopted the guidance prospectively with a cumulative adjustment to Retained earnings. At adoption, Citi recognized a lease liability and a corresponding right-of-use asset, related to its future minimum lease commitments of approximately $4.4 billion. Additionally, the Company recorded a $155 million increase in Retained earnings due to the cumulative effect of recognizing previously deferred gains on sale/leaseback transactions.

Subsequent Measurement of Goodwill

In January 2017, the FASB issued ASU No. 2017-04, Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The ASU simplifies the subsequent measurement of goodwill impairment by eliminating the requirement to calculate the implied fair value of goodwill (i.e., the current Step 2 of the goodwill impairment test) to measure a goodwill impairment charge. Under the ASU, the impairment test is the comparison of the fair value of a reporting unit with its carrying amount (the current Step 1), with the impairment charge being the

deficit in fair value but not exceeding the total amount of goodwill allocated to that reporting unit. The simplified one-step impairment test applies to all reporting units (including those with zero or negative carrying amounts). The ASU will be effective for Citi as of January 1, 2020. The impact of the ASU will depend upon the performance of Citi's reporting units and the market conditions impacting the fair value of each reporting unit going forward.

See Note 1 to the Consolidated Financial Statements for a discussion of "Accounting Changes."

DISCLOSURE CONTROLS AND PROCEDURES

Citi's disclosure controls and procedures are designed to ensure that information required to be disclosed under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, including without limitation that information required to be disclosed by Citi in its SEC filings is accumulated and communicated to management, including the Chief Executive Officer (CEO) and Chief Financial Officer (CFO), as appropriate, to allow for timely decisions regarding required disclosure.

Citi's Disclosure Committee assists the CEO and CFO in their responsibilities to design, establish, maintain and evaluate the effectiveness of Citi's disclosure controls and procedures. The Disclosure Committee is responsible for, among other things, the oversight, maintenance and implementation of the disclosure controls and procedures, subject to the supervision and oversight of the CEO and CFO.

Citi's management, with the participation of its CEO and CFO, has evaluated the effectiveness of Citigroup's disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934) as of December 31, 2018 and, based on that evaluation, the CEO and CFO have concluded that at that date Citigroup's disclosure controls and procedures were effective.

MANAGEMENT'S ANNUAL REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Citi's management is responsible for establishing and maintaining adequate internal control over financial reporting. Citi's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of its financial reporting and the preparation of financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles. Citi'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 Citi's assets, (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 Citi's receipts and expenditures are made only in accordance with authorizations of Citi's management and directors and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of Citi's assets that could have a material effect on its financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect all 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. In addition, given Citi's large size, complex operations and global footprint, lapses or deficiencies in internal controls may occur from time to time.

Citi's management assessed the effectiveness of Citigroup's internal control over financial reporting as of December 31, 2018 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on this assessment, management believes that, as of December 31, 2018, Citi's internal control over financial reporting was effective. In addition, there were no changes in Citi's internal control over financial reporting during the fiscal quarter ended December 31, 2018 that materially affected, or are reasonably likely to materially affect, Citi's internal control over financial reporting.

The effectiveness of Citi's internal control over financial reporting as of December 31, 2018 has been audited by KPMG LLP, Citi's independent registered public accounting firm, as stated in their report below, which expressed an unqualified opinion on the effectiveness of Citi's internal control over financial reporting as of December 31, 2018.

FORWARD-LOOKING STATEMENTS

Certain statements in this Form 10-K, including but not limited to statements included within the Management's Discussion and Analysis of Financial Condition and Results of Operations, are "forward-looking statements" within the meaning of the rules and regulations of the U.S. Securities and Exchange Commission (SEC). In addition, Citigroup also may make forward-looking statements in its other documents filed or furnished with the SEC and its management may make forward-looking statements orally to analysts, investors, representatives of the media and others.

Generally, forward-looking statements are not based on historical facts, but instead represent Citigroup's and its management's beliefs regarding future events. Such statements may be identified by words such as believe, expect, anticipate, intend, estimate, may increase, may fluctuate, target, illustrate, and similar expressions or future or conditional verbs such as will, should, would and could.

Such statements are based on management's current expectations and are subject to risks, uncertainties and changes in circumstances. Actual results and capital and other financial conditions may differ materially from those included in these statements due to a variety of factors, including, without limitation, (i) the precautionary statements included within each individual business's discussion and analysis of its results of operations and (ii) the factors listed and described under "Risk Factors" above.

Any forward-looking statements made by or on behalf of Citigroup speak only as to the date they are made and Citi does not undertake to update forward-looking statements to reflect the impact of circumstances or events that arise after the date the forward-looking statements were made.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM—
INTERNAL CONTROL OVER FINANCIAL REPORTING

The Board of Directors and Stockholders
Citigroup Inc.:

Opinion on Internal Control Over Financial Reporting
We have audited Citigroup Inc. and subsidiaries' (the "Company") internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.
We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheet of the Company as of December 31, 2018 and 2017, the related consolidated statements of income, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the "consolidated financial statements"), and our report dated February 22, 2019 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion
The Company's management is responsible 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 annual report on internal control over financial reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have

a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ KPMG LLP
New York, New York
February 22, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM—
CONSOLIDATED FINANCIAL STATEMENTS

The Board of Directors and Stockholders
Citigroup Inc.:

Opinion on the Consolidated Financial Statements
We have audited the accompanying consolidated balance sheet of Citigroup Inc. and subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of income, comprehensive income, changes in stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.
We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 22, 2019 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion
These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 1969.

New York, New York
February 22, 2019

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CONSOLIDATED FINANCIAL STATEMENTS

CONSOLIDATED STATEMENT OF INCOME — Citigroup Inc. and Subsidiaries

	Years ended December 31,		
In millions of dollars, except per share amounts	2018	2017	2016
Revenues[1]			
Interest revenue	$70,828	$61,579	$57,988
Interest expense	24,266	16,518	12,512
Net interest revenue	$46,562	$45,061	$45,476
Commissions and fees	$11,857	$12,707	$11,678
Principal transactions	9,062	9,475	7,857
Administration and other fiduciary fees	3,580	3,584	3,294
Realized gains on sales of investments, net	421	778	949
Impairment losses on investments			
Gross impairment losses	(132)	(63)	(620)
Net impairment losses recognized in earnings	$(132)	$(63)	$(620)
Other revenue	$1,504	$902	$2,163
Total non-interest revenues	$26,292	$27,383	$25,321
Total revenues, net of interest expense	$72,854	$72,444	$70,797
Provisions for credit losses and for benefits and claims			
Provision for loan losses	$7,354	$7,503	$6,749
Policyholder benefits and claims	101	109	204
Provision (release) for unfunded lending commitments	113	(161)	29
Total provisions for credit losses and for benefits and claims	$7,568	$7,451	$6,982
Operating expenses[1]			
Compensation and benefits	$21,154	$21,181	$20,970
Premises and equipment	2,324	2,453	2,542
Technology/communication	7,193	6,909	6,701
Advertising and marketing	1,545	1,608	1,632
Other operating	9,625	10,081	10,493
Total operating expenses	$41,841	$42,232	$42,338
Income from continuing operations before income taxes	$23,445	$22,761	$21,477
Provision for income taxes	5,357	29,388	6,444
Income (loss) from continuing operations	$18,088	$(6,627)	$15,033
Discontinued operations			
Loss from discontinued operations	$(26)	$(104)	$(80)
Provision (benefit) for income taxes	(18)	7	(22)
Loss from discontinued operations, net of taxes	$(8)	$(111)	$(58)
Net income (loss) before attribution of noncontrolling interests	$18,080	$(6,738)	$14,975
Noncontrolling interests	35	60	63
Citigroup’s net income (loss)	$18,045	$(6,798)	$14,912
Basic earnings per share[2]			
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74
Loss from discontinued operations, net of taxes	—	(0.04)	(0.02)
Net income (loss)	$6.69	$(2.98)	$4.72
Weighted average common shares outstanding (in millions)	2,493.3	2,698.5	2,888.1

CONSOLIDATED STATEMENT OF INCOME (Continued)	Citigroup Inc. and Subsidiaries		
	Years ended December 31,		
In millions of dollars, except per share amounts	2018	2017	2016
Diluted earnings per share[2]			
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74
Income (loss) from discontinued operations, net of taxes	—	(0.04)	(0.02)
Net income (loss)	$6.68	$(2.98)	$4.72
Adjusted weighted average common shares outstanding (in millions)	2,494.2	2,698.5	2,888.3

(1) Certain prior-period revenue and expense lines and totals were reclassified to conform to the current period's presentation. See Notes 1 and 3 to the Consolidated Financial Statements.

(2) Due to rounding, earnings per share on continuing operations and discontinued operations may not sum to earnings per share on net income.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME	Citigroup Inc. and Subsidiaries		
	Years ended December 31,		
In millions of dollars	2018	2017	2016
Citigroup's net income (loss)	$18,045	$(6,798)	$14,912
Add: Citigroup's other comprehensive income (loss)			
Net change in unrealized gains and losses on investment securities, net of taxes[1][4]	$(1,089)	$(863)	$108
Net change in debt valuation adjustment (DVA), net of taxes[1]	1,113	(569)	(337)
Net change in cash flow hedges, net of taxes	(30)	(138)	57
Benefit plans liability adjustment, net of taxes[2]	(74)	(1,019)	(48)
Net change in foreign currency translation adjustment, net of taxes and hedges	(2,362)	(202)	(2,802)
Net change in excluded component of fair value hedges, net of taxes	(57)	—	—
Citigroup's total other comprehensive income (loss)[3]	$(2,499)	$(2,791)	$(3,022)
Citigroup's total comprehensive income (loss)	$15,546	$(9,589)	$11,890
Add: Other comprehensive income (loss) attributable to noncontrolling interests	$(43)	$114	$(56)
Add: Net income attributable to noncontrolling interests	35	60	63
Total comprehensive income (loss)	$15,538	$(9,415)	$11,897

(1) See Note 1 to the Consolidated Financial Statements.

(2) See Note 8 to the Consolidated Financial Statements.

(3) Includes the impact of ASU 2018-02, adopted in 2017. See Note 1 to the Consolidated Financial Statements.

(4) For the year ended December 31, 2018, amount represents the net change in unrealized gains and losses on available-for-sale (AFS) debt securities. Effective January 1, 2018, the AFS category is eliminated for equity securities under ASU 2016-01.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

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CONSOLIDATED BALANCE SHEET Citigroup Inc. and Subsidiaries

In millions of dollars	December 31, 2018	2017
Assets		
Cash and due from banks (including segregated cash and other deposits)	$23,645	$23,775
Deposits with banks	164,460	156,741
Federal funds sold and securities borrowed and purchased under agreements to resell (including $147,701 and $132,949 as of December 31, 2018 and 2017, respectively, at fair value)	270,684	232,478
Brokerage receivables	35,450	38,384
Trading account assets (including $112,932 and $99,460 pledged to creditors at December 31, 2018 and 2017, respectively)	256,117	252,790
Investments:		
Available-for-sale debt securities (including $9,289 and $9,493 pledged to creditors as of December 31, 2018 and 2017, respectively)	288,038	290,725
Held-to-maturity debt securities (including $971 and $435 pledged to creditors as of December 31, 2018 and 2017, respectively)	63,357	53,320
Equity securities (including $1,109 and $1,395 at fair value as of December 31, 2018 and 2017, respectively, of which $189 was available for sale as of December 31, 2017)	7,212	8,245
Total investments	$358,607	$352,290
Loans:		
Consumer (including $20 and $25 as of December 31, 2018 and 2017, respectively, at fair value)	330,487	333,656
Corporate (including $3,203 and $4,349 as of December 31, 2018 and 2017, respectively, at fair value)	353,709	333,378
Loans, net of unearned income	$684,196	$667,034
Allowance for loan losses	(12,315)	(12,355)
Total loans, net	$671,881	$654,679
Goodwill	22,046	22,256
Intangible assets (including MSRs of $584 and $558 as of December 31, 2018 and 2017, respectively, at fair value)	5,220	5,146
Other assets (including $20,788 and $18,559 as of December 31, 2018 and 2017, respectively, at fair value)	109,273	103,926
Total assets	$1,917,383	$1,842,465

The following table presents certain assets of consolidated variable interest entities (VIEs), which are included in the Consolidated Balance Sheet above. The assets in the table below include those assets that can only be used to settle obligations of consolidated VIEs, presented on the following page, and are in excess of those obligations. Additionally, the assets in the table below include third-party assets of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation.

In millions of dollars	December 31, 2018	2017
Assets of consolidated VIEs to be used to settle obligations of consolidated VIEs		
Cash and due from banks	$270	$52
Trading account assets	917	1,129
Investments	1,796	2,498
Loans, net of unearned income		
Consumer	49,403	54,656
Corporate	19,259	19,835

Loans, net of unearned income	$68,662	$74,491
Allowance for loan losses	(1,852)	(1,930)
Total loans, net	$66,810	$72,561
Other assets	151	154
Total assets of consolidated VIEs to be used to settle obligations of consolidated VIEs	$69,944	$76,394

Statement continues on the next page.

CONSOLIDATED BALANCE SHEET Citigroup Inc. and Subsidiaries
(Continued)

In millions of dollars, except shares and per share amounts	December 31, 2018	2017
Liabilities		
Non-interest-bearing deposits in U.S. offices	$105,836	$126,880
Interest-bearing deposits in U.S. offices (including $717 and $303 as of December 31, 2018 and 2017, respectively, at fair value)	361,573	318,613
Non-interest-bearing deposits in offices outside the U.S.	80,648	87,440
Interest-bearing deposits in offices outside the U.S. (including $758 and $1,162 as of December 31, 2018 and 2017, respectively, at fair value)	465,113	426,889
Total deposits	$1,013,170	$959,822
Federal funds purchased and securities loaned and sold under agreements to repurchase (including $44,510 and $40,638 as of December 31, 2018 and 2017, respectively, at fair value)	177,768	156,277
Brokerage payables	64,571	61,342
Trading account liabilities	144,305	125,170
Short-term borrowings (including $4,483 and $4,627 as of December 31, 2018 and 2017, respectively, at fair value)	32,346	44,452
Long-term debt (including $38,229 and $31,392 as of December 31, 2018 and 2017, respectively, at fair value)	231,999	236,709
Other liabilities (including $15,906 and $13,961 as of December 31, 2018 and 2017, respectively, at fair value)	56,150	57,021
Total liabilities	$1,720,309	$1,640,793
Stockholders' equity		
Preferred stock ($1.00 par value; authorized shares: 30 million), issued shares: 738,400 as of December 31, 2018 and 770,120 as of December 31, 2017, at aggregate liquidation value	$18,460	$19,253
Common stock ($0.01 par value; authorized shares: 6 billion), issued shares: 3,099,567,177 as of December 31, 2018 and 3,099,523,273 as of December 31, 2017	31	31
Additional paid-in capital	107,922	108,008
Retained earnings	151,347	138,425
Treasury stock, at cost: 731,099,833 shares as of December 31, 2018 and 529,614,728 shares as of December 31, 2017	(44,370)	(30,309)
Accumulated other comprehensive income (loss) (AOCI)	(37,170)	(34,668)
Total Citigroup stockholders' equity	$196,220	$200,740
Noncontrolling interest	854	932
Total equity	$197,074	$201,672
Total liabilities and equity	$1,917,383	$1,842,465

The following table presents certain liabilities of consolidated VIEs, which are included in the Consolidated Balance Sheet above. The liabilities in the table below include third-party liabilities of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation. The liabilities also exclude amounts where creditors or beneficial interest holders have recourse to the general credit of Citigroup.

In millions of dollars	December 31, 2018	2017

Liabilities of consolidated VIEs for which creditors or beneficial interest holders do not have recourse to the general credit of Citigroup		
Short-term borrowings	$13,134	$10,142
Long-term debt	28,514	30,492
Other liabilities	697	611
Total liabilities of consolidated VIEs for which creditors or beneficial interest holders do not have recourse to the general credit of Citigroup	$42,345	$41,245

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF CHANGES IN STOCKHOLDERS' EQUITY Citigroup Inc. and Subsidiaries

	Years ended December 31,					
	Amounts			Shares		
In millions of dollars, except shares in thousands	2018	2017	2016	2018	2017	2016
Preferred stock at aggregate liquidation value						
Balance, beginning of year	$19,253	$19,253	$16,718	770	770	669
Issuance of preferred stock	—	—	2,535	—	—	101
Redemption of preferred stock	(793)	—	—	(32)	—	—
Balance, end of period	$18,460	$19,253	$19,253	738	770	770
Common stock and additional paid-in capital						
Balance, beginning of year	$108,039	$108,073	$108,319	3,099,523	3,099,482	3,099,482
Employee benefit plans	(94)	(27)	(251)	44	41	—
Preferred stock issuance expense	—	—	(37)	—	—	—
Other	8	(7)	42	—	—	—
Balance, end of period	$107,953	$108,039	$108,073	3,099,567	3,099,523	3,099,482
Retained earnings						
Balance, beginning of year	$138,425	$146,477	$133,841			
Adjustment to opening balance, net of taxes[1]	(84)	(660)	15			
Adjusted balance, beginning of period	$138,341	$145,817	$133,856			
Citigroup's net income (loss)	18,045	(6,798)	14,912			
Common dividends[2]	(3,865)	(2,595)	(1,214)			
Preferred dividends	(1,174)	(1,213)	(1,077)			
Impact of Tax Reform related to AOCI reclassification[3]	—	3,304	—			
Other[4]	—	(90)	—			
Balance, end of period	$151,347	$138,425	$146,477			
Treasury stock, at cost						
Balance, beginning of year	$(30,309)	$(16,302)	$(7,677)	(529,615)	(327,090)	(146,203)
Employee benefit plans[5]	484	531	826	10,557	11,651	14,256
Treasury stock acquired[6]	(14,545)	(14,538)	(9,451)	(212,042)	(214,176)	(195,143)
Balance, end of period	$(44,370)	$(30,309)	$(16,302)	(731,100)	(529,615)	(327,090)
Citigroup's accumulated other comprehensive income (loss)						
Balance, beginning of year	$(34,668)	$(32,381)	$(29,344)			
Adjustment to opening balance, net of taxes[1]	(3)	504	(15)			
Adjusted balance, beginning of period	$(34,671)	$(31,877)	$(29,359)			
Citigroup's total other comprehensive income (loss)[3]	(2,499)	(2,791)	(3,022)			
Balance, end of period	$(37,170)	$(34,668)	$(32,381)			
Total Citigroup common stockholders' equity	$177,760	$181,487	$205,867	2,368,467	2,569,908	2,772,392
Total Citigroup stockholders' equity	$196,220	$200,740	$225,120			
Noncontrolling interests						
Balance, beginning of year	$932	$1,023	$1,235			
Transactions between noncontrolling-interest shareholders and the related consolidated subsidiary	—	(28)	(11)			
Transactions between Citigroup and the noncontrolling-interest shareholders	(50)	(121)	(130)			
Net income attributable to noncontrolling-interest shareholders	35	60	63			
	(38)	(44)	(42)			

Dividends paid to noncontrolling-interest shareholders			
Other comprehensive income (loss) attributable to noncontrolling-interest shareholders	(43)	114	(56)
Other	18	(72)	(36)
Net change in noncontrolling interests	$(78)	$(91)	$(212)
Balance, end of period	$854	$932	$1,023
Total equity	$197,074	$201,672	$226,143

(1) See Note 1 to the Consolidated Financial Statements for additional details.

(2) Common dividends declared were $0.32 per share in the first and second quarters and $0.45 per share in the third and fourth quarters of 2018; $0.16 per share in the first and second quarters and $0.32 per share in the third and fourth quarters of 2017; and $0.05 in the first and second quarters and $0.16 per share in the third and fourth quarters of 2016.

(3) Includes the impact of ASU 2018-02, which transferred those amounts from AOCI to Retained earnings. See Notes 1 and 19 to the Consolidated Financial Statements.

(4) Includes the impact of ASU No. 2016-09, Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting. See Note 1 to the Consolidated Financial Statements.

(5) Includes treasury stock related to (i) certain activity on employee stock option program exercises, where the employee delivers existing shares to cover the option exercise, or (ii) under Citi’s employee-restricted or deferred-stock programs, where shares are withheld to satisfy tax requirements.

(6) For 2018, 2017, and 2016, primarily consists of open market purchases under Citi’s Board of Directors-approved common stock repurchase program.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF CASH FLOWS Citigroup Inc. and Subsidiaries

	Years ended December 31,		
In millions of dollars	2018	2017	2016
Cash flows from operating activities of continuing operations			
Net income (loss) before attribution of noncontrolling interests	$18,080	$(6,738)	$14,975
Net income attributable to noncontrolling interests	35	60	63
Citigroup's net income (loss)	$18,045	$(6,798)	$14,912
Loss from discontinued operations, net of taxes	(8)	(111)	(58)
Income (loss) from continuing operations—excluding noncontrolling interests	$18,053	$(6,687)	$14,970
Adjustments to reconcile net income to net cash provided by operating activities of continuing operations			
Net gains on significant disposals[1]	(247)	(602)	(404)
Depreciation and amortization	3,754	3,659	3,720
Deferred tax provision[2]	(51)	24,877	1,459
Provision for loan losses	7,354	7,503	6,749
Realized gains from sales of investments	(421)	(778)	(948)
Net impairment losses on investments, goodwill and intangible assets	132	91	621
Change in trading account assets	(3,469)	(7,038)	(3,092)
Change in trading account liabilities	19,135	(15,375)	21,409
Change in brokerage receivables, net of brokerage payables	6,163	(5,307)	2,226
Change in loans HFS	770	247	6,603
Change in other assets	(5,791)	(3,364)	(6,676)
Change in other liabilities	(871)	(3,044)	96
Other, net	(7,559)	(2,956)	7,000
Total adjustments	$18,899	$(2,087)	$38,763
Net cash provided by (used in) operating activities of continuing operations	$36,952	$(8,774)	$53,733
Cash flows from investing activities of continuing operations			
Change in federal funds sold and securities borrowed or purchased under agreements to resell	$(38,206)	$4,335	$(17,138)
Change in loans	(29,002)	(58,062)	(39,761)
Proceeds from sales and securitizations of loans	4,549	8,365	18,140
Purchases of investments	(186,987)	(185,740)	(211,402)
Proceeds from sales of investments[3]	61,491	107,368	132,183
Proceeds from maturities of investments	118,104	84,369	65,525
Proceeds from significant disposals[1]	314	3,411	265
Capital expenditures on premises and equipment and capitalized software	(3,774)	(3,361)	(2,756)
Proceeds from sales of premises and equipment, subsidiaries and affiliates and repossessed assets	212	377	667
Other, net	181	187	142
Net cash used in investing activities of continuing operations	$(73,118)	$(38,751)	$(54,135)
Cash flows from financing activities of continuing operations			
Dividends paid	$(5,020)	$(3,797)	$(2,287)
Issuance (redemption) of preferred stock	(793)	—	2,498
Treasury stock acquired	(14,433)	(14,541)	(9,290)
Stock tendered for payment of withholding taxes	(482)	(405)	(316)
Change in federal funds purchased and securities loaned or sold under agreements to repurchase	21,491	14,456	(4,675)
Issuance of long-term debt	60,655	67,960	63,806
Payments and redemptions of long-term debt	(58,132)	(40,986)	(55,460)
Change in deposits	53,348	30,416	24,394

Change in short-term borrowings	(12,106)	13,751	9,622

CONSOLIDATED STATEMENT OF CASH FLOWS (Continued)	Citigroup Inc. and Subsidiaries		
	Years ended December 31,		
In millions of dollars	2018	2017	2016
Net cash provided by financing activities of continuing operations	$44,528	$66,854	$28,292
Effect of exchange rate changes on cash and cash equivalents	$(773)	$693	$(493)
Change in cash, due from banks and deposits with banks[4]	$7,589	$20,022	$27,397
Cash, due from banks and deposits with banks at beginning of period[4]	180,516	160,494	133,097
Cash, due from banks and deposits with banks at end of period[4]	$188,105	$180,516	$160,494
Cash and due from banks	$23,645	$23,775	$23,043
Deposits with banks	$164,460	$156,741	$137,451
Cash, due from banks and deposits with banks at end of period	$188,105	$180,516	$160,494
Supplemental disclosure of cash flow information for continuing operations			
Cash paid during the year for income taxes	$4,313	$2,083	$4,359
Cash paid during the year for interest	22,963	15,675	12,067
Non-cash investing activities			
Transfers to loans HFS from loans	$4,200	$5,900	$13,900
Transfers to OREO and other repossessed assets	151	113	165

(1) See Note 2 to the Consolidated Financial Statements for further information on significant disposals.

(2) Includes the full impact of the $22.6 billion non-cash charge related to the Tax Cuts and Jobs Act (Tax Reform) in 2017. See Notes 1 and 9 to the Consolidated Financial Statements for further information.

(3) Proceeds for 2016 include approximately $3.3 billion from the sale of Citi’s investment in China Guangfa Bank.

(4) Includes the impact of ASU 2016-18, Restricted Cash. See Notes 1 and 26 to the Consolidated Financial Statements.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Throughout these Notes, “Citigroup,” “Citi” and the “Company” refer to Citigroup Inc. and its consolidated subsidiaries. Certain reclassifications have been made to the prior periods’ financial statements and Notes to conform to the current period’s presentation.

Principles of Consolidation
The Consolidated Financial Statements include the accounts of Citigroup and its subsidiaries prepared in accordance with U.S. generally accepted accounting principles (GAAP). The Company consolidates subsidiaries in which it holds, directly or indirectly, more than 50% of the voting rights or where it exercises control. Entities where the Company holds 20% to 50% of the voting rights and/or has the ability to exercise significant influence, other than investments of designated venture capital subsidiaries or investments accounted for at fair value under the fair value option, are accounted for under the equity method, and the pro rata share of their income (loss) is included in Other revenue. Income from investments in less-than-20%-owned companies is recognized when dividends are received. As discussed in more detail in Note 21 to the Consolidated Financial Statements, Citigroup also consolidates entities deemed to be variable interest entities when Citigroup is determined to be the primary beneficiary. Gains and losses on the disposition of branches, subsidiaries, affiliates, buildings and other investments are included in Other revenue.

Citibank
Citibank, N.A. (Citibank) is a commercial bank and wholly owned subsidiary of Citigroup. Citibank’s principal offerings include consumer finance, mortgage lending and retail banking (including commercial banking) products and services; investment banking, cash management and trade finance; and private banking products and services.

Variable Interest Entities (VIEs)
An entity is a variable interest entity (VIE) if it meets either of the criteria outlined in Accounting Standards Codification (ASC) Topic 810, Consolidation, which are (i) the entity has equity that is insufficient to permit the entity to finance its activities without additional subordinated financial support from other parties, or (ii) the entity has equity investors that cannot make significant decisions about the entity’s operations or that do not absorb their proportionate share of the entity’s expected losses or expected returns.
The Company consolidates a VIE when it has both the power to direct the activities that most significantly impact the VIE’s economic performance and a right to receive benefits or the obligation to absorb losses of the entity that could be potentially significant to the VIE (that is, Citi is the primary beneficiary). In addition to variable interests held in

consolidated VIEs, the Company has variable interests in other VIEs that are not consolidated because the Company is not the primary beneficiary.
All unconsolidated VIEs are monitored by the Company to assess whether any events have occurred to cause its primary beneficiary status to change.
All entities not deemed to be VIEs with which the Company has involvement are evaluated for consolidation under other subtopics of ASC 810. See Note 21 to the Consolidated Financial Statements for more detailed information.

Foreign Currency Translation
Assets and liabilities of Citi’s foreign operations are translated from their respective functional currencies into U.S. dollars using period-end spot foreign exchange rates. The effects of those translation adjustments are reported in Accumulated other comprehensive income (loss), a component of stockholders’ equity, net of any related hedge and tax effects, until realized upon sale or substantial liquidation of the foreign operation, at which point such amounts related to the foreign entity are reclassified into earnings. Revenues and expenses of Citi’s foreign operations are translated monthly from their respective functional currencies into U.S. dollars at amounts that approximate weighted average exchange rates.

For transactions that are denominated in a currency other than the functional currency, including transactions denominated in the local currencies of foreign operations that use the U.S. dollar as their functional currency, the effects of changes in exchange rates are primarily included in Principal transactions, along with the related effects of any economic hedges. Instruments used to hedge foreign currency exposures include foreign currency forward, option and swap contracts and, in certain instances, designated issues of non-U.S. dollar debt. Foreign operations in countries with highly inflationary economies designate the U.S. dollar as their functional currency, with the effects of changes in exchange rates primarily included in Other revenue.

Investment Securities

Investments include fixed income and equity securities. Fixed income instruments include bonds, notes and redeemable preferred stocks, as well as certain loan-backed and structured securities that are subject to prepayment risk. Equity securities include common and nonredeemable preferred stock.

Fixed income securities are classified and accounted for as follows:

- Fixed income securities classified as “held-to-maturity” are securities that the Company has both the ability and the intent to hold until maturity and are carried at amortized cost. Interest income on such securities is included in Interest revenue.
- Fixed income securities classified as “available-for-sale” are carried at fair value with changes in fair value

reported in Accumulated other comprehensive income (loss), a component of stockholders' equity, net of applicable income taxes and hedges. Interest income on such securities is included in Interest revenue.

Prior to January 1, 2018, equity securities were classified and accounted for as follows:

- Marketable equity securities classified as "available-for-sale" were carried at fair value with changes in fair value reported in Accumulated other comprehensive income (loss), a component of stockholders' equity, net of applicable income taxes and hedges. Dividend income on such securities was included in Interest revenue.
- Certain investments in non-marketable equity securities and certain investments that would otherwise have been accounted for using the equity method were carried at fair value, since the Company elected to apply fair value accounting. Changes in fair value of such investments were recorded in earnings.
- Certain non-marketable equity securities were carried at cost.

As of January 1, 2018, equity securities are classified and accounted for as follows:

- Marketable equity securities are measured at fair value with changes in fair value recognized in earnings. The available-for-sale category was eliminated for equity securities.
- Non-marketable equity securities are measured at fair value with changes in fair value recognized in earnings unless (i) the measurement alternative is elected or (ii) the investment represents Federal Reserve Bank and Federal Home Loan Bank stock or certain exchange seats that continue to be carried at cost. Non-marketable equity securities under the measurement alternative are carried at cost plus or minus changes resulting from observed prices for orderly transactions for the identical or a similar investment of the same issuer.
- Certain investments that would otherwise have been accounted for using the equity method are carried at fair value with changes in fair value recognized in earnings, since the Company elected to apply fair value accounting.

For investments in fixed income securities classified as held-to-maturity or available-for-sale, the accrual of interest income is suspended for investments that are in default or for which it is likely that future interest payments will not be made as scheduled.

Investment securities not measured at fair value through earnings, such as securities held in HTM, AFS or under the new measurement alternative, are subject to evaluation for impairment as described in Note 13 to the Consolidated Financial Statements. Realized gains and losses on sales of investments are included in earnings, primarily on a specific identification basis.

The Company uses a number of valuation techniques for investments carried at fair value, which are described in Note 24 to the Consolidated Financial Statements.

Trading Account Assets and Liabilities

Trading account assets include debt and marketable equity securities, derivatives in a receivable position, residual interests in securitizations and physical commodities inventory. In addition, as described in Note 25 to the Consolidated Financial Statements, certain assets that Citigroup has elected to carry at fair value under the fair value option, such as loans and purchased guarantees, are also included in Trading account assets.

Trading account liabilities include securities sold, not yet purchased (short positions) and derivatives in a net payable position, as well as certain liabilities that Citigroup has elected to carry at fair value (as described in Note 25 to the Consolidated Financial Statements).

Other than physical commodities inventory, all trading account assets and liabilities are carried at fair value. Revenues generated from trading assets and trading liabilities are generally reported in Principal transactions and include realized gains and losses as well as unrealized gains and losses resulting from changes in the fair value of such instruments. Interest income on trading assets is recorded in Interest revenue reduced by interest expense on trading liabilities.

Physical commodities inventory is carried at the lower of cost or market with related losses reported in Principal transactions. Realized gains and losses on sales of commodities inventory are included in Principal transactions.

Investments in unallocated precious metals accounts (gold, silver, platinum and palladium) are accounted for as hybrid instruments containing a debt host contract and an embedded non-financial derivative instrument indexed to the price of the relevant precious metal. The embedded derivative instrument is separated from the debt host contract and accounted for at fair value. The debt host contract is carried at fair value under the fair value option, as described in Note 25 to the Consolidated Financial Statements.

Derivatives used for trading purposes include interest rate, currency, equity, credit and commodity swap agreements, options, caps and floors, warrants, and financial and commodity futures and forward contracts. Derivative asset and liability positions are presented net by counterparty on the Consolidated Balance Sheet when a valid master netting agreement exists and the other conditions set out in ASC Topic 210-20, Balance Sheet—Offsetting, are met. See Note 22 to the Consolidated Financial Statements.

The Company uses a number of techniques to determine the fair value of trading assets and liabilities, which are described in Note 24 to the Consolidated Financial Statements.

Securities Borrowed and Securities Loaned

Securities borrowing and lending transactions do not constitute a sale of the underlying securities for accounting purposes and are treated as collateralized financing transactions. Such transactions are recorded at the amount of proceeds advanced or received plus accrued interest. As described in Note 25 to the Consolidated Financial Statements, the Company has elected to apply fair value accounting to a number of securities borrowing and lending transactions. Fees paid or received for all securities lending and borrowing transactions are recorded in Interest expense or Interest revenue at the contractually specified rate.

The Company monitors the fair value of securities borrowed or loaned on a daily basis and obtains or posts additional collateral in order to maintain contractual margin protection.

As described in Note 24 to the Consolidated Financial Statements, the Company uses a discounted cash flow technique to determine the fair value of securities lending and borrowing transactions.

Repurchase and Resale Agreements

Securities sold under agreements to repurchase (repos) and securities purchased under agreements to resell (reverse repos) do not constitute a sale (or purchase) of the underlying securities for accounting purposes and are treated as collateralized financing transactions. As described in Note 25 to the Consolidated Financial Statements, the Company has elected to apply fair value accounting to the majority of such transactions, with changes in fair value reported in earnings. Any transactions for which fair value accounting has not been elected are recorded at the amount of cash advanced or received plus accrued interest. Irrespective of whether the Company has elected fair value accounting, interest paid or received on all repo and reverse repo transactions is recorded in Interest expense or Interest revenue at the contractually specified rate.

Where the conditions of ASC 210-20-45-11, Balance Sheet—Offsetting: Repurchase and Reverse Repurchase Agreements, are met, repos and reverse repos are presented net on the Consolidated Balance Sheet.

The Company’s policy is to take possession of securities purchased under reverse repurchase agreements. The Company monitors the fair value of securities subject to repurchase or resale on a daily basis and obtains or posts additional collateral in order to maintain contractual margin protection.

As described in Note 24 to the Consolidated Financial Statements, the Company uses a discounted cash flow technique to determine the fair value of repo and reverse repo transactions.

Loans

Loans are reported at their outstanding principal balances net of any unearned income and unamortized deferred fees and costs except that credit card receivable balances also include accrued interest and fees. Loan origination fees and certain direct origination costs are generally deferred and

recognized as adjustments to income over the lives of the related loans.

As described in Note 25 to the Consolidated Financial Statements, Citi has elected fair value accounting for certain loans. Such loans are carried at fair value with changes in fair value reported in earnings. Interest income on such loans is recorded in Interest revenue at the contractually specified rate.

Loans that are held-for-investment are classified as Loans, net of unearned income on the Consolidated Balance Sheet, and the related cash flows are included within the cash flows from investing activities category in the Consolidated Statement of Cash Flows on the line Change in loans. However, when the initial intent for holding a loan has changed from held-for-investment to HFS, the loan is reclassified to HFS, but the related cash flows continue to be reported in cash flows from investing activities in the Consolidated Statement of Cash Flows on the line Proceeds from sales and securitizations of loans.

Consumer Loans

Consumer loans represent loans and leases managed primarily by the Global Consumer Banking (GCB) businesses and Corporate/Other.

Consumer Non-accrual and Re-aging Policies

As a general rule, interest accrual ceases for installment and real estate (both open- and closed-end) loans when payments are 90 days contractually past due. For credit cards and other unsecured revolving loans, however, Citi generally accrues interest until payments are 180 days past due. As a result of OCC guidance, home equity loans in regulated bank entities are classified as non-accrual if the related residential first mortgage is 90 days or more past due. Also as a result of OCC guidance, mortgage loans in regulated bank entities are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy, other than FHA-insured loans. Commercial banking loans are placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due.

Loans that have been modified to grant a concession to a borrower in financial difficulty may not be accruing interest at the time of the modification. The policy for returning such modified loans to accrual status varies by product and/or region. In most cases, a minimum number of payments (ranging from one to six) is required, while in other cases the loan is never returned to accrual status. For regulated bank entities, such modified loans are returned to accrual status if a credit evaluation at the time of, or subsequent to, the modification indicates the borrower is able to meet the restructured terms, and the borrower is current and has demonstrated a reasonable period of sustained payment performance (minimum six months of consecutive payments).

For U.S. consumer loans, generally one of the conditions to qualify for modification is that a minimum

number of payments (typically ranging from one to three) must be made. Upon modification, the loan is re-aged to current status. However, re-aging practices for certain open-ended consumer loans, such as credit cards, are governed by Federal Financial Institutions Examination Council (FFIEC) guidelines. For open-ended consumer loans subject to FFIEC guidelines, one of the conditions for the loan to be re-aged to current status is that at least three consecutive minimum monthly payments, or the equivalent amount, must be received. In addition, under FFIEC guidelines, the number of times that such a loan can be re-aged is subject to limitations (generally once in 12 months and twice in five years). Furthermore, Federal Housing Administration (FHA) and Department of Veterans Affairs (VA) loans may only be modified under those respective agencies' guidelines, and payments are not always required in order to re-age a modified loan to current.

Consumer Charge-Off Policies

Citi's charge-off policies follow the general guidelines below:

- Unsecured installment loans are charged off at 120 days contractually past due.
- Unsecured revolving loans and credit card loans are charged off at 180 days contractually past due.
- Loans secured with non-real estate collateral are written down to the estimated value of the collateral, less costs to sell, at 120 days contractually past due.
- Real estate-secured loans are written down to the estimated value of the property, less costs to sell, at 180 days contractually past due.
- Real estate-secured loans are charged off no later than 180 days contractually past due if a decision has been made not to foreclose on the loans.
- Unsecured loans in bankruptcy are charged off within 60 days of notification of filing by the bankruptcy court or in accordance with Citi's charge-off policy, whichever occurs earlier.
- Real estate-secured loans in bankruptcy, other than FHA-insured loans, are written down to the estimated value of the property, less costs to sell, within 60 days of notification that the borrower has filed for bankruptcy or in accordance with Citi's charge-off policy, whichever is earlier.
- Commercial banking loans are written down to the extent that principal is judged to be uncollectable.

Corporate Loans

Corporate loans represent loans and leases managed by Institutional Clients Group (ICG). Corporate loans are identified as impaired and placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due, except when the loan is well collateralized and in the process of collection. Any interest accrued on impaired corporate loans and leases is reversed at 90 days past due and charged

against current earnings, and interest is thereafter included in earnings only to the extent actually received in cash. When there is doubt regarding the ultimate collectability of principal, all cash receipts are thereafter applied to reduce the recorded investment in the loan.

Impaired corporate loans and leases are written down to the extent that principal is deemed to be uncollectable. Impaired collateral-dependent loans and leases, where repayment is expected to be provided solely by the sale of the underlying collateral and there are no other available and reliable sources of repayment, are written down to the lower of carrying value or collateral value. Cash-basis loans are returned to accrual status when all contractual principal and interest amounts are reasonably assured of repayment and there is a sustained period of repayment performance in accordance with the contractual terms.

Loans Held-for-Sale

Corporate and consumer loans that have been identified for sale are classified as loans HFS and included in Other assets. The practice of Citi's U.S. prime mortgage business has been to sell substantially all of its conforming loans. As such, U.S. prime mortgage conforming loans are classified as HFS and the fair value option is elected at origination,

with changes in fair value recorded in Other revenue. With the exception of those loans for which the fair value option has been elected, HFS loans are accounted for at the lower of cost or market value, with any write-downs or subsequent recoveries charged to Other revenue. The related cash flows are classified in the Consolidated Statement of Cash Flows in the cash flows from operating activities category on the line Change in loans held-for-sale.

Allowance for Loan Losses

Allowance for loan losses represents management’s best estimate of probable losses inherent in the portfolio, including probable losses related to large individually evaluated impaired loans and troubled debt restructurings. Attribution of the allowance is made for analytical purposes only, and the entire allowance is available to absorb probable loan losses inherent in the overall portfolio. Additions to the allowance are made through the Provision for loan losses. Loan losses are deducted from the allowance and subsequent recoveries are added. Assets received in exchange for loan claims in a restructuring are initially recorded at fair value, with any gain or loss reflected as a recovery or charge-off in the provision.

Consumer Loans

For consumer loans, each portfolio of non-modified smaller-balance homogeneous loans is independently evaluated for impairment by product type (e.g., residential mortgage, credit card, etc.) in accordance with ASC 450, Contingencies. The allowance for loan losses attributed to these loans is established via a process that estimates the probable losses inherent in the specific portfolio. This process includes migration analysis, in which historical delinquency and credit loss experience is applied to the current aging of the portfolio, together with analyses that

reflect current and anticipated economic conditions, including changes in housing prices and unemployment trends. Citi's allowance for loan losses under ASC 450 only considers contractual principal amounts due, except for credit card loans, where estimated loss amounts related to accrued interest receivable are also included.

Management also considers overall portfolio indicators, including historical credit losses, delinquent, non-performing and classified loans, trends in volumes and terms of loans, an evaluation of overall credit quality, the credit process, including lending policies and procedures, and economic, geographical, product and other environmental factors.

Separate valuation allowances are determined for impaired smaller-balance homogeneous loans whose terms have been modified in a troubled debt restructuring (TDR). Long-term modification programs, and short-term (less than 12 months) modifications that provide concessions (such as interest rate reductions) to borrowers in financial difficulty, are reported as TDRs. In addition, loan modifications that involve a trial period are reported as TDRs at the start of the trial period. The allowance for loan losses for TDRs is determined in accordance with ASC 310-10-35, Receivables—Subsequent Measurement, considering all available evidence, including, as appropriate, the present value of the expected future cash flows discounted at the loan's original contractual effective rate, the secondary market value of the loan and the fair value of collateral less disposal costs. These expected cash flows incorporate modification program default rate assumptions. The original contractual effective rate for credit card loans is the pre-modification rate, which may include interest rate increases under the original contractual agreement with the borrower.

Valuation allowances for commercial banking loans, which are classifiably managed consumer loans, are determined in the same manner as for corporate loans and are described in more detail in the following section. Generally, an asset-specific component is calculated under ASC 310-10-35 on an individual basis for larger-balance, non-homogeneous loans that are considered impaired, and the allowance for the remainder of the classifiably managed consumer loan portfolio is calculated under ASC 450 using a statistical methodology that may be supplemented by management adjustment.

Corporate Loans

In the corporate portfolios, the Allowance for loan losses includes an asset-specific component and a statistically based component. The asset-specific component is calculated under ASC 310-10-35 for larger-balance, non-homogeneous loans that are considered impaired. An asset-specific allowance is established when the discounted cash flows, collateral value (less disposal costs) or observable market price of the impaired loan are lower than its carrying value. This allowance considers the borrower's overall financial condition, resources and payment record, the prospects for support from any financially responsible guarantors (discussed further below) and, if appropriate, the realizable value of any collateral. The asset-specific component of the allowance for smaller-balance impaired

loans is calculated on a pool basis considering historical loss experience.

The allowance for the remainder of the loan portfolio is determined under ASC 450 using a statistical methodology, supplemented by management judgment. The statistical analysis considers the portfolio's size, remaining tenor and credit quality as measured by internal risk ratings assigned to individual credit facilities, which reflect probability of default and loss given default. The statistical analysis considers historical default rates and historical loss severity in the event of default, including historical average levels and historical variability. The result is an estimated range for inherent losses. The best estimate within the range is then determined by management's quantitative and qualitative assessment of current conditions, including general economic conditions, specific industry and geographic trends and internal factors including portfolio concentrations, trends in internal credit quality indicators and current and past underwriting standards.

For both the asset-specific and the statistically based components of the Allowance for loan losses, management may incorporate guarantor support. The financial wherewithal of the guarantor is evaluated, as applicable, based on net worth, cash flow statements and personal or company financial statements, which are updated and reviewed at least annually. Citi seeks performance on guarantee arrangements in the normal course of business. Seeking performance entails obtaining satisfactory cooperation from the guarantor or borrower in the specific situation. This regular cooperation is indicative of pursuit and successful enforcement of the guarantee; the exposure is reduced without the expense and burden of pursuing a legal remedy. A guarantor's reputation and willingness to work with Citigroup are

evaluated based on the historical experience with the guarantor and the knowledge of the marketplace. In the rare event that the guarantor is unwilling or unable to perform or facilitate borrower cooperation, Citi pursues a legal remedy; however, enforcing a guarantee via legal action against the guarantor is not the primary means of resolving a troubled loan situation and rarely occurs. If Citi does not pursue a legal remedy, it is because Citi does not believe that the guarantor has the financial wherewithal to perform regardless of legal action or because there are legal limitations on simultaneously pursuing guarantors and foreclosure. A guarantor's reputation does not impact Citi's decision or ability to seek performance under the guarantee.

In cases where a guarantee is a factor in the assessment of loan losses, it is included via adjustment to the loan's internal risk rating, which in turn is the basis for the adjustment to the statistically based component of the Allowance for loan losses. To date, it is only in rare circumstances that an impaired commercial loan or commercial real estate loan is carried at a value in excess of the appraised value due to a guarantee.

When Citi's monitoring of the loan indicates that the guarantor's wherewithal to pay is uncertain or has deteriorated, there is either no change in the risk rating, because the guarantor's credit support was never initially factored in, or the risk rating is adjusted to reflect that

uncertainty or deterioration. Accordingly, a guarantor's ultimate failure to perform or a lack of legal enforcement of the guarantee does not materially impact the allowance for loan losses, as there is typically no further significant adjustment of the loan's risk rating at that time. Where Citi is not seeking performance under the guarantee contract, it provides for loan losses as if the loans were non-performing and not guaranteed.

Reserve Estimates and Policies

Management provides reserves for an estimate of probable losses inherent in the funded loan portfolio on the Consolidated Balance Sheet in the form of an allowance for loan losses. These reserves are established in accordance with Citigroup's credit reserve policies, as approved by the Audit Committee of the Citigroup Board of Directors. Citi's Chief Risk Officer and Chief Financial Officer review the adequacy of the credit loss reserves each quarter with representatives from the risk management and finance staffs for each applicable business area. Applicable business areas include those having classifiably managed portfolios, where internal credit-risk ratings are assigned (primarily ICG and GCB) or modified consumer loans, where concessions were granted due to the borrowers' financial difficulties.

The aforementioned representatives for these business areas present recommended reserve balances for their funded and unfunded lending portfolios along with supporting quantitative and qualitative data discussed below:

Estimated probable losses for non-performing, non-homogeneous exposures within a business line's classifiably managed portfolio and impaired smaller-balance homogeneous loans whose terms have been modified due to the borrowers' financial difficulties, where it was determined that a concession was granted to the borrower. Consideration may be given to the following, as appropriate, when determining this estimate: (i) the present value of expected future cash flows discounted at the loan's original effective rate, (ii) the borrower's overall financial condition, resources and payment record and (iii) the prospects for support from financially responsible guarantors or the realizable value of any collateral. In the determination of the allowance for loan losses for TDRs, management considers a combination of historical re-default rates, the current economic environment and the nature of the modification program when forecasting expected cash flows. When impairment is measured based on the present value of expected future cash flows, the entire change in present value is recorded in Provision for loan losses.

Statistically calculated losses inherent in the classifiably managed portfolio for performing and de minimis non-performing exposures. The calculation is based on (i) Citi's internal system of credit-risk ratings, which are analogous to the risk ratings of the major rating agencies, and (ii) historical default and loss data, including rating agency information regarding default rates from 1983 to 2017 and internal data dating to the early 1970s on severity of losses in the event of default. Adjustments may be made to this

data. Such adjustments include (i) statistically calculated estimates to cover the historical fluctuation of the default rates over the credit cycle, the historical variability of loss severity among defaulted loans and the degree to which there are large obligor concentrations in the global portfolio and (ii) adjustments made for specific known items, such as current environmental factors and credit trends.

In addition, representatives from each of the risk management and finance staffs that cover business areas with delinquency-managed portfolios containing smaller-balance homogeneous loans present their recommended reserve balances based on leading credit indicators, including loan delinquencies and changes in portfolio size as well as economic trends, including current and future housing prices, unemployment, length of time in foreclosure, costs to sell and GDP. This methodology is applied separately for each individual product within each geographic region in which these portfolios exist.

This evaluation process is subject to numerous estimates and judgments. The frequency of default, risk ratings, loss recovery rates, the size and diversity of individual large credits and the ability of borrowers with foreign currency obligations to obtain the foreign currency necessary for orderly debt servicing, among other things, are all taken into account during this review. Changes in these estimates could have a direct impact on the credit costs in any period and could result in a change in the allowance.

Allowance for Unfunded Lending Commitments

A similar approach to the allowance for loan losses is used for calculating a reserve for the expected losses related to unfunded lending commitments and standby letters of credit. This reserve is classified on the balance sheet in Other liabilities. Changes to the allowance for unfunded lending commitments are recorded in Provision for unfunded lending commitments.

Mortgage Servicing Rights (MSRs)

Mortgage servicing rights (MSRs) are recognized as intangible assets when purchased or when the Company sells or securitizes loans acquired through purchase or origination and retains the right to service the loans. Mortgage servicing rights are accounted for at fair value, with changes in value recorded in Other revenue in the Company's Consolidated Statement of Income.

For additional information on the Company's MSRs, see Notes 16 and 21 to the Consolidated Financial Statements.

Goodwill

Goodwill represents the excess of acquisition cost over the fair value of net tangible and intangible assets acquired in a business combination. Goodwill is subject to annual impairment testing and between annual tests if an event occurs or circumstances change that would more-likely-than-not reduce the fair value of a reporting unit below its carrying amount.

Under ASC Topic 350, Intangibles—Goodwill and Other, the Company has an option to assess qualitative factors to determine if it is necessary to perform the goodwill

impairment test. If, after assessing the totality of events or circumstances, the Company determines that it is not more-likely-than-not that the fair value of a reporting unit is less than its carrying amount, no further testing is necessary. If, however, the Company determines that it is more-likely-than-not that the fair value of a reporting unit is less than its carrying amount, then the Company must perform the first step of the two-step goodwill impairment test. The Company has an unconditional option to bypass the qualitative assessment for any reporting unit in any reporting period and proceed directly to the first step of the goodwill impairment test.

The first step requires a comparison of the fair value of the individual reporting unit to its carrying value, including goodwill. If the fair value of the reporting unit is in excess of the carrying value, the related goodwill is considered not impaired and no further analysis is necessary. If the carrying value of the reporting unit exceeds the fair value, this is an indication of potential impairment and the second step of testing is performed to measure the amount of impairment, if any, for that reporting unit.

If required, the second step involves calculating the implied fair value of goodwill for each of the affected reporting units. The implied fair value of goodwill is determined in the same manner as the amount of goodwill recognized in a business combination, which is the excess of the fair value of the reporting unit determined in step one over the fair value of the net assets and identifiable intangibles as if the reporting unit were being acquired. If the amount of the goodwill allocated to the reporting unit exceeds the implied fair value of the goodwill in the pro forma purchase price allocation, an impairment charge is recorded for the excess. A recognized impairment charge cannot exceed the amount of goodwill allocated to a reporting unit and cannot subsequently be reversed even if the fair value of the reporting unit recovers.

Upon any business disposition, goodwill is allocated to, and derecognized with, the disposed business based on the ratio of the fair value of the disposed business to the fair value of the reporting unit.

Additional information on Citi’s goodwill impairment testing can be found in Note 16 to the Consolidated Financial Statements.

Intangible Assets

Intangible assets—including core deposit intangibles, present value of future profits, purchased credit card relationships, credit card contract related intangibles, other customer relationships and other intangible assets, but excluding MSRs—are amortized over their estimated useful lives. Intangible assets that are deemed to have indefinite useful lives, primarily trade names, are not amortized and are subject to annual impairment tests. An impairment exists if the carrying value of the indefinite-lived intangible asset exceeds its fair value. For other intangible assets subject to amortization, an impairment is recognized if the carrying amount is not recoverable and exceeds the fair value of the intangible asset.

Other Assets and Other Liabilities

Other assets include, among other items, loans HFS, deferred tax assets, equity method investments, interest and fees receivable, premises and equipment (including purchased and developed software), repossessed assets and other receivables. Other liabilities include, among other items, accrued expenses and other payables, deferred tax liabilities and reserves for legal claims, taxes, unfunded lending commitments, repositioning reserves and other matters.

Other Real Estate Owned and Repossessed Assets

Real estate or other assets received through foreclosure or repossession are generally reported in Other assets, net of a valuation allowance for selling costs and subsequent declines in fair value.

Securitizations

There are two key accounting determinations that must be made relating to securitizations. Citi first makes a determination as to whether the securitization entity must be consolidated. Second, it determines whether the transfer of financial assets to the entity is considered a sale under GAAP. If the securitization entity is a VIE, the Company consolidates the VIE if it is the primary beneficiary (as discussed in “Variable Interest Entities” above). For all other securitization entities determined not to be VIEs in which Citigroup participates, consolidation is based on which

party has voting control of the entity, giving consideration to removal and liquidation rights in certain partnership structures. Only securitization entities controlled by Citigroup are consolidated.

Interests in the securitized and sold assets may be retained in the form of subordinated or senior interest-only strips, subordinated tranches, spread accounts and servicing rights. In credit card securitizations, the Company retains a seller's interest in the credit card receivables transferred to the trusts, which is not in securitized form. In the case of consolidated securitization entities, including the credit card trusts, these retained interests are not reported on Citi's Consolidated Balance Sheet. The securitized loans remain on
the balance sheet. Substantially all of the consumer loans sold or securitized through non-consolidated trusts by Citigroup are U.S. prime residential mortgage loans. Retained interests in non-consolidated mortgage securitization trusts are classified as Trading account assets, except for MSRs, which are included in Intangible assets on Citigroup's Consolidated Balance Sheet.

Debt

Short-term borrowings and Long-term debt are accounted for at amortized cost, except where the Company has elected to report the debt instruments, including certain structured notes at fair value, or the debt is in a fair value hedging relationship.

Transfers of Financial Assets

For a transfer of financial assets to be considered a sale: (i) the assets must be legally isolated from the Company, even

in bankruptcy or other receivership, (ii) the purchaser must have the right to pledge or sell the assets transferred (or, if the purchaser is an entity whose sole purpose is to engage in securitization and asset-backed financing activities through the issuance of beneficial interests and that entity is constrained from pledging the assets it receives, each beneficial interest holder must have the right to sell or pledge their beneficial interests) and (iii) the Company may not have an option or obligation to reacquire the assets.

If these sale requirements are met, the assets are removed from the Company's Consolidated Balance Sheet. If the conditions for sale are not met, the transfer is considered to be a secured borrowing, the assets remain on the Consolidated Balance Sheet and the sale proceeds are recognized as the Company's liability. A legal opinion on a sale generally is obtained for complex transactions or where the Company has continuing involvement with assets transferred or with the securitization entity. For a transfer to be eligible for sale accounting, that opinion must state that the asset transfer would be considered a sale and that the assets transferred would not be consolidated with the Company's other assets in the event of the Company's insolvency.

For a transfer of a portion of a financial asset to be considered a sale, the portion transferred must meet the definition of a participating interest. A participating interest must represent a pro rata ownership in an entire financial asset; all cash flows must be divided proportionately, with the same priority of payment; no participating interest in the transferred asset may be subordinated to the interest of another participating interest holder, and no party may have the right to pledge or exchange the entire financial asset unless all participating interest holders agree. Otherwise, the transfer is accounted for as a secured borrowing.

See Note 21 to the Consolidated Financial Statements for further discussion.

Risk Management Activities—Derivatives Used for Hedging Purposes

The Company manages its exposures to market movements outside of its trading activities by modifying the asset and liability mix, either directly or through the use of derivative financial products, including interest rate swaps, futures, forwards and purchased options, as well as foreign-exchange contracts. These end-user derivatives are carried at fair value in Trading account assets and Trading account liabilities.

See Note 22 to the Consolidated Financial Statements for a further discussion of the Company's hedging and derivative activities.

Employee Benefits Expense

Employee benefits expense includes current service costs of pension and other postretirement benefit plans (which are accrued on a current basis), contributions and unrestricted awards under other employee plans, the amortization of restricted stock awards and costs of other employee benefits.

For its most significant pension and postretirement benefit plans (Significant Plans), Citigroup measures and discloses plan obligations, plan assets and periodic plan expense

quarterly, instead of annually. The effect of remeasuring the Significant Plan obligations and assets by updating plan actuarial assumptions on a quarterly basis is reflected in Accumulated other comprehensive income (loss) and periodic plan expense. All other plans (All Other Plans) are remeasured annually. See Note 8 to the Consolidated Financial Statements.

Stock-Based Compensation

The Company recognizes compensation expense related to stock and option awards over the requisite service period, generally based on the instruments' grant-date fair value, reduced by actual forfeitures as they occur. Compensation cost related to awards granted to employees who meet certain age plus years-of-service requirements (retirement-eligible employees) is accrued in the year prior to the grant date, in the same manner as the accrual for cash incentive compensation. Certain stock awards with performance conditions or certain clawback provisions are subject to variable accounting, pursuant to which the associated compensation expense fluctuates with changes in Citigroup's common stock price. See Note 7 to the Consolidated Financial Statements.

Income Taxes

The Company is subject to the income tax laws of the U.S. and its states and municipalities, as well as the non-U.S. jurisdictions in which it operates. These tax laws are complex and may be subject to different interpretations by the taxpayer and the relevant governmental taxing authorities. In establishing a provision for income tax expense, the Company must make judgments and interpretations about these tax laws. The Company must also make estimates about when in the future certain items will affect taxable income in the various tax jurisdictions, both domestic and foreign.

Disputes over interpretations of the tax laws may be subject to review and adjudication by the court systems of the various tax jurisdictions, or may be settled with the taxing authority upon examination or audit. The Company treats interest and penalties on income taxes as a component of Income tax expense.

Deferred taxes are recorded for the future consequences of events that have been recognized in financial statements or tax returns, based upon enacted tax laws and rates. Deferred tax assets are recognized subject to management's judgment about whether realization is more-likely-than-not. ASC 740, Income Taxes, sets out a consistent framework to determine the appropriate level of tax reserves to maintain for uncertain tax positions. This interpretation uses a two-step approach wherein a tax benefit is recognized if a position is more-likely-than-not to be sustained. The amount of the benefit is then measured to be the highest tax benefit that is more than 50% likely to be realized. ASC 740 also sets out disclosure requirements to enhance transparency of an entity's tax reserves.

See Note 9 to the Consolidated Financial Statements for a further description of the Company's tax provision and related income tax assets and liabilities.

Commissions, Underwriting and Principal Transactions
Commissions and fees revenues are recognized in income when earned. Underwriting revenues are recognized in income typically at the closing of the transaction. Principal transactions revenues are recognized in income on a trade-date basis. See Note 5 to the Consolidated Financial Statements for a description of the Company's revenue recognition policies for Commissions and fees, and Note 6 to the Consolidated Financial Statements for details of Principal transactions revenue.

Earnings per Share
Earnings per share (EPS) is computed after deducting preferred stock dividends. The Company has granted restricted and deferred share awards with dividend rights that are considered to be participating securities, which are akin to a second class of common stock. Accordingly, a portion of Citigroup's earnings is allocated to those participating securities in the EPS calculation.
Basic earnings per share is computed by dividing income available to common stockholders after the allocation of dividends and undistributed earnings to the participating securities by the weighted average number of common shares outstanding for the period. Diluted earnings per share reflects the potential dilution that could occur if securities or other contracts to issue common stock were exercised. It is computed after giving consideration to the weighted average dilutive effect of the Company's stock options and warrants and convertible securities and after the allocation of earnings to the participating securities. Anti-dilutive options and warrants are disregarded in the EPS calculations.

Use of Estimates
Management must make estimates and assumptions that affect the Consolidated Financial Statements and the related Notes to the Consolidated Financial Statements. Such estimates are used in connection with certain fair value measurements. See Note 24 to the Consolidated Financial Statements for further discussions on estimates used in the determination of fair value. Moreover, estimates are significant in determining the amounts of other-than-temporary impairments, impairments of goodwill and other intangible assets, provisions for probable losses that may arise from credit-related exposures and probable and estimable losses related to litigation and regulatory proceedings, and income taxes. While management makes its best judgment, actual amounts or results could differ from those estimates.

Cash Flows
Cash equivalents are defined as those amounts included in Cash and due from banks and predominately all of Deposits with banks. Cash flows from risk management activities are classified in the same category as the related assets and liabilities.

Related Party Transactions
The Company has related party transactions with certain of its subsidiaries and affiliates. These transactions, which are primarily short-term in nature, include cash accounts, collateralized financing transactions, margin accounts, derivative transactions, charges for operational support and the borrowing and lending of funds, and are entered into in the ordinary course of business.

ACCOUNTING CHANGES

SEC Staff Accounting Bulletin 118
On December 22, 2017, the SEC issued Staff Accounting Bulletin (SAB) 118, which set forth the accounting for the changes in tax law caused by the enactment of the Tax Cuts and Jobs Act (Tax Reform). SAB 118 provided guidance where the accounting under ASC 740 was incomplete for certain income tax effects of Tax Reform, at the time of the issuance of an entity's financial statements for the period in which Tax Reform was enacted (provisional items). Citi disclosed several provisional items recorded as part of its $22.6 billion fourth quarter 2017 charge related to Tax Reform.

Citi completed its accounting for Tax Reform under SAB 118 during the fourth quarter of 2018 and recorded a one-time, non-cash tax benefit of $94 million in Corporate/Other related to amounts that were considered provisional pursuant to SAB 118. The adjustments related to the provisional amounts consisted of a $1.2 billion benefit relating to a reduction of the valuation allowance against Citi's FTC carry-forwards and its U.S. residual DTAs related to its non-U.S. branches, offset by an additional $0.2 billion charge related to the impact of a change to a "quasi-territorial tax system" and an additional $0.9 billion charge related to the impact of deemed repatriation of undistributed earnings of non-U.S. subsidiaries.
Also, Citi has made a policy election to account for taxes on GILTI as incurred.

Revenue Recognition
In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2014-09, Revenue from Contracts with Customers (Revenue Recognition), which outlines a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers. The core principle of the revenue model is that an entity recognizes revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The ASU defines the promised good or service as the performance obligation under the contract.
While the guidance replaces most existing revenue recognition guidance in GAAP, the ASU is not applicable to financial instruments and, therefore, does not impact a majority of the Company's revenues, including net interest income, loan fees, gains on sales and mark-to-market accounting.

In accordance with the new revenue recognition standard, Citi has identified the specific performance obligation (promised services) associated with the contract with the customer and has determined when that specific performance obligation has been satisfied, which may be at a point in time or over time depending on how the performance obligation is defined. The contracts with customers also contain the transaction price, which consists of fixed consideration and/or consideration that may vary (variable consideration), and is defined as the amount of consideration an entity expects to be entitled to when or as the performance obligation is satisfied, excluding amounts collected on behalf of third parties (including transaction taxes). The amounts recognized at the point in time the performance obligation is satisfied may differ from the ultimate transaction price associated with that performance obligation when a portion of it is based on variable consideration. For example, some consideration is based on the client's month-end balance or market values which are unknown at the time the contract is executed. The remaining transaction price amount, if any, will be recognized as the variable consideration becomes determinable. In certain transactions, the performance obligation is considered satisfied at a point in time in the future. In this instance, Citi defers revenue on the balance sheet that will only be recognized upon completion of the performance obligation.
The new revenue recognition standard further clarified the guidance related to reporting revenue gross as principal versus net as an agent. In many cases, Citi outsources a component of its performance obligations to third parties. The Company has determined that it acts as principal in the majority of these transactions and therefore presents the amounts paid to these third parties gross within operating expenses.
The Company has retrospectively adopted this standard as of January 1, 2018 and as a result was required to report amounts paid to third parties where Citi is principal to the contract within Operating expenses. The adoption resulted in an increase in both revenue and expenses of approximately $1 billion for each of the years ended December 31, 2018 and 2017 with similar amounts for prior years. Prior to adoption, these expense amounts were reported as contra revenue primarily within Commissions and fees and Administration and other fiduciary fees revenues. Accordingly, prior periods have been reclassified to conform to the new presentation.
See Note 5 to the Consolidated Financial Statements for a description of the Company's revenue recognition policies for Commissions and fees and Administration and other fiduciary fees.

Income Tax Impact of Intra-Entity Transfers of Assets
In October 2016, the FASB issued ASU No. 2016-16, Income Taxes—Intra-Entity Transfers of Assets Other Than Inventory, which requires an entity to recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. The ASU was effective January 1, 2018 and was adopted as of that date. The impact of this standard was an increase of DTAs by

approximately $300 million, a decrease of Retained earnings by approximately $80 million and a decrease of prepaid tax assets by approximately $380 million.

Clarifying the Definition of a Business
In January 2017, the FASB issued ASU No. 2017-01, Business Combinations (Topic 805): Clarifying the Definition of a Business. The definition of a business directly and indirectly affects many areas of accounting (e.g., acquisitions, disposals, goodwill and consolidation). The ASU narrows the definition of a business by introducing a quantitative screen as the first step, such that if substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets, then the set of transferred assets and activities is not a business. If the set is not scoped out from the quantitative screen, the entity then evaluates whether the set meets the requirement that a business include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs.
Citi adopted the ASU upon its effective date on January 1, 2018, prospectively. The ongoing impact of the ASU will depend upon the acquisition and disposal activities of Citi. If fewer transactions qualify as a business, there could be less initial recognition of Goodwill, but also less goodwill allocated to disposals. There was no impact during 2018 from the adoption of this ASU.

Changes in Accounting for Pension and Postretirement (Benefit) Expense

In March 2017, the FASB issued ASU No. 2017-07, Compensation—Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, which changes the income statement presentation of net benefit expense and requires restating the Company's financial statements for each of the earlier periods presented in Citi's annual and interim financial statements. The change in presentation was effective for annual and interim periods starting January 1, 2018. The ASU requires that only the service cost component of net benefit expense be included in Compensation and benefits on the income statement. The other components of net benefit expense are required to be presented outside of Compensation and benefits and are presented in Other operating expenses. Since both of these income statement line items are part of Operating expenses, total Operating expenses and Net income will not change. This change in presentation did not have a material effect on Compensation and benefits and Other operating expenses and is applied prospectively. The components of the net benefit expense are currently disclosed in Note 8 to the Consolidated Financial Statements.

The new standard also changes the components of net benefit expense that are eligible for capitalization when employee costs are capitalized in connection with various activities, such as internally developed software, construction-in-progress and loan origination costs. Prospectively from January 1, 2018, only the service cost

component of net benefit expense may be capitalized. Existing capitalized balances are not affected. This change in amounts eligible for capitalization does not have a material effect on the Company's Consolidated Financial Statements and related disclosures.

Pension Accounting

In August 2018, the FASB issued ASU 2018-14, Defined Benefit Plans (Topic 715-20): Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans. The amendments modify certain disclosure requirements for defined benefit plans and are effective January 1, 2021, with early adoption permitted. The Company adopted this ASU as of December 31, 2018 and the adoption of this standard did not have a material impact on the Company.

Hedging

In August 2017, the FASB issued ASU No. 2017-12, Targeted Improvements to Accounting for Hedging Activities, which better aligns an entity's risk management activities and financial reporting for hedging relationships through changes to the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results. The ASU requires the change in the fair value of the hedging instrument to be presented in the same income statement line as the hedged item and also requires expanded disclosures. Citi adopted this standard on January 1, 2018 and transferred approximately $4 billion of pre-payable mortgage-backed securities and municipal bonds from held-to-maturity (HTM) into available-for-sale (AFS) securities classification as permitted as a one-time transfer upon adoption of the standard, as these assets were deemed to be eligible to be hedged under the last-of-layer hedge strategy. The impact to opening Retained earnings was immaterial. See Note 19 to the Consolidated Financial Statements for more information.

Recognition and Measurement of Financial Assets and Financial Liabilities

In January 2016, the FASB issued ASU No. 2016-01, Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which addresses certain aspects of recognition, measurement, presentation and disclosure of financial instruments. In February 2018, the FASB issued ASU No. 2018-03, Technical Corrections and Improvements to Financial Instruments—Overall (Subtopic 825-10), to clarify certain provisions in ASU 2016-01.

The ASUs require entities to present separately in AOCI the portion of the total change in the fair value of a liability resulting from a change in the instrument-specific credit risk when the entity has elected to measure the liability at fair value in accordance with the fair value option for financial instruments. The ASUs also require equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income, thus eliminating the AFS

category for equity investments. However, Federal Reserve Bank and Federal Home Loan Bank stock, as well as certain exchange seats, will continue to be presented at cost. The ASUs also provide an instrument-by-instrument election to measure non-marketable equity investments using a measurement alternative. Under the measurement alternative, the investment is carried at cost plus or minus changes resulting from observable prices in orderly transactions for the identical or a similar investment of the same issuer. Equity securities under the measurement alternative are also assessed for impairment. Finally, the ASUs require that fair value disclosures for financial instruments not measured at fair value on the balance sheet be presented at their exit prices (e.g., held-for-investment loans).

Citi early adopted the provisions of ASU 2016-01

related to presentation of the change in fair value of liabilities for which the fair value option was elected, related to changes in Citigroup's own credit spreads in Accumulated other comprehensive income (loss) (AOCI) effective

January 1, 2016. Accordingly, these amounts have been reflected as a component of AOCI, whereas these amounts were previously recognized in Citigroup's revenues and net income. The impact of adopting this amendment resulted in a cumulative catch-up reclassification from Retained earnings to AOCI of an accumulated after-tax loss of approximately $15 million at January 1, 2016. Financial statements for periods prior to 2016 were not subject to restatement under the provisions of this ASU. For additional information, see Notes 19, 24 and 25 to the Consolidated Financial Statements.

Citi adopted the other provisions of ASU 2016-01 and ASU 2018-03 as of January 1, 2018. Accordingly, as of the first quarter of 2018, the changes to accounting for equity securities and fair value disclosures have been reflected in Citigroup's financial statements. The impact of adopting the change to AFS equity securities resulted in a cumulative catch-up reclassification from AOCI to Retained earnings of an accumulated after-tax gain of approximately $3 million at January 1, 2018. Citi elected the measurement alternative for all non-marketable equity investments that no longer qualify for cost measurement under the ASUs. This provision in the ASUs was adopted prospectively. Financial statements for periods prior to 2018 were not subject to restatement under the provisions of the ASUs. For additional information, see Notes 13, 19 and 24 to the Consolidated Financial Statements.

Statement of Cash Flows

In November 2016, the FASB issued ASU No. 2016-18, Restricted Cash, which requires that companies present cash, cash equivalents and amounts generally described as restricted cash or restricted cash equivalents (restricted cash) when reconciling beginning-of-period and end-of-period totals on the Statement of Cash Flows. In connection with the adoption of the ASU, Citigroup also changed its definition of cash and cash equivalents to include all of Cash and due from banks and predominately all of Deposits with banks. The Company has retrospectively adopted this ASU

as of January 1, 2018 and as a result Net cash provided by investing activities of continuing operations on the Statement of Cash Flows for the years ended December 31, 2017 and 2016 increased by $19.3 billion and $25.3 billion, respectively.
In August 2016, the FASB issued ASU No. 2016-15, Classification of Certain Cash Receipts and Cash Payments, which provides guidance on the classification and presentation of certain cash receipts and payments on the Statement of Cash Flows. The Company has retrospectively adopted this ASU as of January 1, 2018, which resulted in immaterial changes to Citi's Consolidated Statement of Cash Flows.

Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income
On February 14, 2018, the Financial Accounting Standards Board (FASB) issued ASU No. 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income. The ASU allows a reclassification from Accumulated other comprehensive income (loss) (AOCI) to Retained earnings for the deferred taxes previously recorded in AOCI that exceed the current federal tax rate of 21% resulting from the newly enacted corporate tax rate in Tax Reform and other stranded tax amounts related to the application of Tax Reform that Citi elects to reclassify. The ASU allows adjustments to reclassification amounts in subsequent periods as a result of changes to the amounts recorded under SAB 118. Citi elected to early adopt the ASU effective December 31, 2017, which affected only the period that the effects related to the one-time Tax Reform charge were recognized. In addition to the reclassification of deferred taxes recorded in AOCI that exceed the current federal tax rate, Citi also reclassified amounts recorded in AOCI related to the effects of the shift to a territorial system related to the application of Tax Reform using the portfolio method.
The effect of adopting the ASU resulted in an increase of $3.3 billion to Retained earnings at December 31, 2017 due to the reclassification of AOCI to Retained earnings.

Premium Amortization on Purchased Callable
Debt Securities
In March 2017, the FASB issued ASU No. 2017-08, Receivables—Nonrefundable Fees and Other Costs (Subtopic 310-20): Premium Amortization on Purchased Callable Debt Securities, which amends the amortization period for certain purchased callable debt securities held at a premium. The ASU requires entities to amortize premiums on debt securities by the first call date when the securities have fixed and determinable call dates and prices. The scope of the ASU includes all accounting premiums, such as purchase premiums and cumulative fair value hedge adjustments. The ASU does not change the accounting for discounts, which continue to be recognized over the contractual life of a security.
Citi early adopted the ASU in the second quarter of 2017, with an effective date of January 1, 2017. Adoption of the ASU is on a modified retrospective basis through a

cumulative effect adjustment to Retained earnings as of the beginning of the year of adoption. Adoption of the ASU primarily affected Citi's AFS and HTM portfolios of callable state and municipal debt securities. The ASU adoption resulted in a net reduction to total stockholders' equity of $156 million (after-tax), effective as of January 1, 2017. This amount is composed of a reduction of approximately $660 million to Retained earnings for the incremental amortization of purchase premiums and cumulative hedge adjustments generated under fair value hedges of these callable debt securities, offset by an increase to AOCI of $504 million related to the cumulative fair value hedge adjustments reclassified to Retained earnings for AFS debt securities.

Accounting for Stock-Based Compensation
In March 2016, the FASB issued ASU No. 2016-09, Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting in order to simplify certain complex aspects of the accounting for income taxes and forfeitures related to employee stock-based compensation. The guidance became effective for Citi beginning on January 1, 2017. Under the new standard, excess tax benefits and deficiencies related to employee stock-based compensation are recognized directly within income tax expense or benefit in Citi's Consolidated Statement of Income, rather than within additional paid-in capital. The impact of this change was not material in the

first quarter of 2017 or each subsequent quarterly period of 2017 as the majority of employees' deferred stock-based compensation awards are granted within the first quarter of each year and, therefore, vest within the first quarter of each year, commensurate with vesting in equal annual installments. For additional information on these receivables and payables, see Note 7 to the Consolidated Financial Statements.

Additionally, as permitted under the new guidance, Citi made an accounting policy election to account for forfeitures of awards as they occur, which represents a change from the previous requirement to estimate forfeitures when recognizing compensation expense. This change resulted in a cumulative effect adjustment to Retained earnings that was not material at January 1, 2017.

Fair Value Measurement

In August 2018, the FASB issued ASU No. 2018-13, Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement. The amendments modify certain disclosure requirements for fair value measurements and are effective January 1, 2020, with early adoption permitted. The Company early adopted this ASU as of December 31, 2018 in its entirety. The adoption of this standard did not have a material impact on the Company.

2. DISCONTINUED OPERATIONS AND SIGNIFICANT DISPOSALS

Summary of Discontinued Operations

The Company's Discontinued operations consisted of residual activities related to the sales of the Brazil Credicard business in 2013, the Egg Banking plc Credit Card Business in 2011 and the German Retail Banking business in 2008. All Discontinued operations results are recorded within Corporate/Other.

The following summarizes financial information for all Discontinued operations:

In millions of dollars	2018	2017	2016
Total revenues, net of interest expense	$—	$—	$—
Loss from discontinued operations	$(26)	$(104)	$(80)
Provision (benefit) for income taxes	(18)	7	(22)
Loss from discontinued operations, net of taxes	$(8)	$(111)	$(58)

Cash flows from Discontinued operations were not material for all periods presented.

Significant Disposals

The transactions described below were identified as significant disposals during 2018, 2017 and 2016. The major classes of Assets and Liabilities derecognized from the Consolidated Balance Sheet at closing, and the income (loss) before taxes related to each business until the disposal date, are presented below.

Sale of Mexico Asset Management Business

On September 21, 2018, Citi completed the sale of its Mexico asset management business, which was part of Latin America GCB. As part of the sale, Citi derecognized total assets of $137 million, including goodwill of $32 million, which were classified as held-for-sale beginning in the fourth quarter of 2017, and total liabilities of $41 million. The transaction resulted in a pretax gain on sale of approximately $250 million (approximately $150 million after-tax) recorded in Other revenue in the third quarter of 2018. Further, Citi and the buyer entered into a 10-year services framework agreement, with Citi acting as the distributor in exchange for an ongoing fee.

Income before taxes, excluding the pretax gain on sale, for the divested business was as follows:

In millions of dollars	2018	2017	2016
Income before taxes	$123	$164	$155

Sale of Fixed Income Analytics and Index Business

On August 31, 2017, Citi completed the sale of a fixed income analytics business and a fixed income index business that were part of Markets and securities services within Institutional Clients Group (ICG). As part of the sale, Citi derecognized Total assets of $112 million, including goodwill of $72 million, while the derecognized liabilities were $18 million. The transaction resulted in a pretax gain on sale of approximately $580 million ($355 million after-tax) recorded in Other revenue in ICG during 2017.

Income before taxes excluding the pretax gain on sale for the divested businesses was immaterial for the periods presented.

Exit of U.S. Mortgage Service Operations

Citigroup executed agreements during the first quarter of 2017 to effectively exit its direct U.S. mortgage servicing operations by the end of 2018 to intensify focus on originations. The exit of the mortgage servicing operations included the sale of mortgage servicing rights and execution of a subservicing agreement for the remaining Citi-owned loans and certain other mortgage servicing rights. As part of this transaction, Citi has also transferred certain employees.

This transaction, which was part of Corporate/Other, resulted in a pretax loss of $331 million ($207 million after-tax) recorded in Other revenue during 2017. The loss on sale did not include certain other costs and charges related to the

disposed operation recorded primarily in Operating expenses during 2017, resulting in a total pretax loss of $382 million. As part of the sale, Citi derecognized a total of $1,162 million of servicing-related assets, including $1,046 million of Mortgage servicing rights, related to approximately 750,000 Fannie Mae and Freddie Mac held loans with outstanding balances of approximately $93 billion. Excluding the loss on sale and the additional charges, income before taxes for the disposed operation was immaterial for the periods presented.

Sale of CitiFinancial Canada Consumer Finance Business

On March 31, 2017, Citi completed the sale of CitiFinancial Canada (CitiFinancial), which was part of Corporate/Other, and included 220 retail branches and approximately 1,400 employees. As part of the sale, Citi derecognized Total assets of approximately $1.9 billion, including $1.7 billion consumer loans (net of allowance), and Total liabilities of approximately $1.5 billion related to intercompany borrowings, which were settled at closing of the transaction. Separately, during 2017 and prior to closing of the transaction, CitiFinancial settled $0.4 billion of debt issued through loan securitizations. The sale of CitiFinancial generated a pretax gain on sale of approximately $350 million recorded in Other revenue ($178 million after-tax) during 2017.

Income before taxes, excluding the pretax gain on sale for the divested business, was as follows:

In millions of dollars	2018	2017	2016
Income before taxes	$	$ 41	$ 139

3. BUSINESS SEGMENTS

Citigroup's activities are conducted through the following business segments: Global Consumer Banking (GCB) and Institutional Clients Group (ICG). In addition, Corporate/Other includes activities not assigned to a specific business segment, as well as certain North America loan portfolios, discontinued operations and other legacy assets. The business segments are determined based on products and services provided or type of customers served, of which those identified as non-core are recorded in Corporate/Other and are reflective of how management currently evaluates financial information to make business decisions.

GCB includes a global, full-service consumer franchise delivering a wide array of banking, including commercial banking, credit card lending and investment services through a network of local branches, offices and electronic delivery systems and consists of three GCB businesses: North America, Latin America and Asia (including consumer banking activities in certain EMEA countries).

ICG consists of Banking and Markets and securities services and provides corporate, institutional, public sector and high-net-worth clients in 98 countries and jurisdictions with a broad range of banking and financial products and services.

Corporate/Other includes certain unallocated costs of global functions, other corporate expenses and net treasury results, unallocated corporate expenses, offsets to certain line-

item reclassifications and eliminations, the results of certain North America legacy loan portfolios, discontinued operations and unallocated taxes.

The accounting policies of these reportable segments are the same as those disclosed in Note 1 to the Consolidated Financial Statements.

The prior-period balances reflect reclassifications to conform the presentation for all periods to the current period's presentation. Effective January 1, 2018, financial data was reclassified to reflect:

- the adoption of ASU No. 2014-09, Revenue Recognition, which occurred on January 1, 2018 on a retrospective basis. See "Accounting Changes" in Note 1 to the Consolidated Financial Statements;
- the re-attribution of certain costs between Corporate/Other and GCB and ICG; and
- certain other immaterial reclassifications.

Citi's consolidated net income (loss) reported in its 2017 Annual Report on Form 10-K remains unchanged for all periods presented as a result of the changes and reclassifications discussed above.

The following table presents certain information regarding the Company's continuing operations by segment:

	Revenues, net of interest expense[1]			Provision (benefits) for income taxes[2]			Income (loss) from continuing operations[2][3]			Identifiable assets	
In millions of dollars, except identifiable assets in billions	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017
Global Consumer Banking	$33,777	$32,838	$31,624	$1,839	$3,316	$2,639	$5,762	$3,878	$4,931	$432	$428
Institutional Clients Group	36,994	36,474	33,940	3,631	7,008	4,260	12,200	9,066	9,525	1,394	1,336
Corporate/Other	2,083	3,132	5,233	(113)	19,064	(455)	126	(19,571)	577	91	78
Total	$72,854	$72,444	$70,797	$5,357	$29,388	$6,444	$18,088	$(6,627)	$15,033	$1,917	$1,842

(1) Includes total revenues, net of interest expense (excluding Corporate/Other), in North America of $33.4 billion, $34.2 billion and $32.6 billion; in EMEA of $11.8 billion, $10.9 billion and $10.0 billion; in Latin America of $10.3 billion, $9.6 billion and $9.1 billion; and in Asia of $15.3 billion, $14.6 billion and $13.9 billion in 2018, 2017 and 2016, respectively. These regional numbers exclude Corporate/Other, which largely operates within the U.S.

(2) Corporate/Other, GCB and ICG 2017 results include the one-time impact of Tax Reform.

(3) Includes pretax provisions for credit losses and for benefits and claims in the GCB results of $7.6 billion, $7.6 billion and $6.4 billion; in the ICG results of $184 million, ($15) million and $486 million; and in Corporate/Other results of ($202) million, ($175) million and $69 million in 2018, 2017 and 2016, respectively.

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4. INTEREST REVENUE AND EXPENSE

Interest revenue and Interest expense consisted of the following:

In millions of dollars	2018	2017	2016
Interest revenue			
Loan interest, including fees	$ 45,682	$ 41,736	$ 40,125
Deposits with banks	2,203	1,635	971
Federal funds sold and securities borrowed or purchased under agreements to resell	5,492	3,249	2,543
Investments, including dividends	9,494	8,295	7,582
Trading account assets[1]	6,284	5,501	5,738
Other interest	1,673	1,163	1,029
Total interest revenue	$ 70,828	$ 61,579	$ 57,988
Interest expense			
Deposits[2]	$ 9,616	$ 6,587	$ 5,300
Federal funds purchased and securities loaned or sold under agreements to repurchase	4,889	2,661	1,912
Trading account liabilities[1]	1,001	638	410
Short-term borrowings	2,209	1,059	477
Long-term debt	6,551	5,573	4,413
Total interest expense	$ 24,266	$ 16,518	$ 12,512
Net interest revenue	$ 46,562	$ 45,061	$ 45,476
Provision for loan losses	7,354	7,503	6,749
Net interest revenue after provision for loan losses	$ 39,208	$ 37,558	$ 38,727

(1) Interest expense on Trading account liabilities is reported as a reduction of interest revenue from Trading account assets.

(2) Includes deposit insurance fees and charges of $1,182 million, $1,249 million and $1,145 million for 2018, 2017 and 2016, respectively.

5. COMMISSIONS AND FEES; ADMINISTRATION AND OTHER FIDUCIARY FEES

The primary components of Commissions and fees revenue are investment banking fees, brokerage commissions, credit- and bank-card income and deposit-related fees.

Investment banking fees are substantially composed of underwriting and advisory revenues. Such fees are recognized at the point in time when Citigroup's performance under the terms of a contractual arrangement is completed, which is typically at the closing of a transaction. Reimbursed expenses related to these transactions are recorded as revenue and are included within investment banking fees. In certain instances for advisory contracts, Citi will receive amounts in advance of the deal's closing. In these instances, the amounts received will be recognized as a liability and not recognized in revenue until the transaction closes. The contract liability amount for the periods presented was negligible. Out-of-pocket expenses associated with underwriting activity are deferred and recognized at the time the related revenue is recognized, while out-of-pocket expenses associated with advisory arrangements are expensed as incurred. In general, expenses incurred related to investment banking transactions, whether consummated or not, are recorded in Other operating expenses. The Company has determined that it acts as principal in the majority of these transactions and therefore presents expenses gross within Other operating expenses.

Brokerage commissions primarily include commissions and fees from the following: executing transactions for clients on exchanges and over-the-counter markets; sales of mutual funds and other annuity products; and assisting clients in clearing transactions, providing brokerage services and other such activities. Brokerage commissions are recognized in Commissions and fees at the point in time the associated service is fulfilled, generally on the trade execution date. Gains or losses, if any, on these transactions are included in Principal transactions (see Note 6 to the Consolidated Financial Statements). Sales of certain investment products include a portion of variable consideration associated with the underlying product. In these instances, a portion of the revenue associated with the sale of the product is not recognized until the variable consideration becomes fixed. The Company recognized $521 million, $416 million and $371 million of revenue related to such variable consideration for the years ended December 31, 2018, 2017 and 2016, respectively. These amounts primarily relate to performance obligations satisfied in prior periods.

Credit- and bank-card income is primarily composed of interchange fees, which are earned by card issuers based on purchase sales, and certain card fees, including annual fees. Costs related to customer reward programs and certain payments to partners (primarily based on program sales, profitability and customer acquisitions) are recorded as a reduction of credit- and bank-card income. Interchange revenues are recognized as earned on a daily basis when Citi's performance obligation to transmit funds to the payment networks has been satisfied. Annual card fees, net of origination costs, are deferred and amortized on a straight-line basis over a 12-month period. Costs related to card reward programs are recognized when the rewards are earned by the

cardholders. Payments to partners are recognized when incurred.

Deposit-related fees consist of service charges on deposit accounts and fees earned from performing cash management activities and other deposit account services. Such fees are recognized in the period in which the related service is provided.

Transactional service fees primarily consist of fees charged for processing services such as cash management, global payments, clearing, international funds transfer and other trade services. Such fees are recognized as/when the associated service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi.

Insurance distribution revenue consists of commissions earned from third-party insurance companies for marketing and selling insurance policies on behalf of such entities. Such commissions are recognized in Commissions and fees at the point in time the associated service is fulfilled, generally when the insurance policy is sold to the policyholder. Sales of certain insurance products include a portion of variable consideration associated with the underlying product. In these instances, a portion of the revenue associated with the sale of the policy is not recognized until the variable consideration becomes determinable. The Company recognized $386 million, $440 million and $479 million of revenue related to such variable consideration for the years ended December 31, 2018, 2017 and 2016, respectively. These amounts primarily relate to performance obligations in prior periods.

Insurance premiums consist of premium income from insurance policies that Citi has underwritten and sold to policyholders.

The following table presents Commissions and fees revenue:

	2018				2017				2016			
In millions of dollars	ICG	GCB	Corp/Other	Total	ICG	GCB	Corp/Other	Total	ICG	GCB	Corp/Other	Total
Investment banking	$3,568	$—	$ —	$3,568	$3,817	$—	$ —	$3,817	$3,000	$—	$ —	$3,000
Brokerage commissions	1,977	815	—	2,792	1,889	826	3	2,718	1,748	636	11	2,395
Credit- and bank-card income												
Interchange fees	1,072	8,117	11	9,200	950	7,526	99	8,575	837	6,189	164	7,190
Card-related loan fees	63	627	12	702	53	693	48	794	27	784	65	876
Card rewards and partner payments	(503)	(8,254)	(12)	(8,769)	(425)	(7,243)	(57)	(7,725)	(361)	(6,084)	(111)	(6,556)
Deposit-related fees[1]	949	654	1	1,604	947	726	14	1,687	818	721	19	1,558
Transactional service fees	718	98	4	820	738	91	49	878	700	84	136	920
Corporate finance[2]	729	5	—	734	761	5	—	766	741	4	—	745
Insurance distribution revenue[3]	14	565	11	590	12	562	68	642	10	584	90	684
Insurance premiums[3]	—	119	—	119	—	122	—	122	—	136	144	280
Loan servicing	156	122	37	315	146	101	95	342	147	127	77	351
Other	25	143	14	182	(38)	99	30	91	31	90	114	235
Total commissions and fees[4]	$8,768	$3,011	$ 78	$11,857	$8,850	$3,508	$ 349	$12,707	$7,698	$3,271	$ 709	$11,678

(1) Includes overdraft fees of $128 million, $135 million and $133 million for the years ended December 31, 2018, 2017 and 2016, respectively. Overdraft fees are accounted for under ASC 310.

(2) Consists primarily of fees earned from structuring and underwriting loan syndications or related financing activity. This activity is accounted for under ASC 310.

(3) Previously reported as insurance premiums in the Consolidated Statement of Income.

(4) Commissions and fees includes $(6,766) million, $(5,568) million and $(4,169) million not accounted for under ASC 606, Revenue from Contracts with Customers, for the years ended December 31, 2018, 2017 and 2016, respectively. Amounts reported in Commissions and fees accounted for under other guidance primarily include card-related loan fees, card reward programs and certain partner payments, corporate finance fees, insurance premiums and loan servicing fees.

Administration and Other Fiduciary Fees

Administration and other fiduciary fees are primarily composed of custody fees and fiduciary fees.

The custody product is composed of numerous services related to the administration, safekeeping and reporting for both U.S. and non-U.S. denominated securities. The services offered to clients include trade settlement, safekeeping, income collection, corporate action notification, record-keeping and reporting, tax reporting and cash management. These services are provided for a wide range of securities, including but not limited to equities, municipal and corporate bonds, mortgage- and asset-backed securities, money market instruments, U.S. Treasuries and agencies, derivative instruments, mutual funds, alternative investments and precious metals. Custody fees are recognized as or when the associated promised service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi.

Fiduciary fees consist of trust services and investment management services. As an escrow agent, Citi receives, safe-

keeps, services and manages clients' escrowed assets such as cash, securities, property (including intellectual property), contracts or other collateral. Citi performs its escrow agent duties by safekeeping the funds during the specified time period agreed upon by all parties and therefore earns its revenue evenly during the contract duration.

Investment management services consist of managing assets on behalf of Citi's retail and institutional clients. Revenue from these services primarily consists of asset-based fees for advisory accounts, which are based on the market value of the client's assets and recognized monthly, when the market value is fixed. In some instances, the Company contracts with third-party advisors and with third-party custodians. The Company has determined that it acts as principal in the majority of these transactions and therefore presents the amounts paid to third parties gross within Other operating expenses.

The following table presents Administration and other fiduciary fees:

	2018				2017				2016			
In millions of dollars	ICG	GCB	Corp/Other	Total	ICG	GCB	Corp/Other	Total	ICG	GCB	Corp/Other	Total
Custody fees	$1,494	$136	$ 65	$1,695	$1,505	$167	$ 56	$1,728	$1,353	$163	$ 48	$1,564
Fiduciary fees	645	597	43	1,285	593	575	91	1,259	554	539	50	1,143
Guarantee fees	536	57	7	600	535	54	8	597	523	54	10	587
Total administration and other fiduciary fees[(1)]	$2,675	$790	$ 115	$3,580	$2,633	$796	$ 155	$3,584	$2,430	$756	$ 108	$3,294

(1) Administration and other fiduciary fees includes $600 million, $597 million and $587 million for the years ended December 31, 2018, 2017 and 2016, respectively, that are not accounted for under ASC 606, Revenue from Contracts with Customers. These amounts include guarantee fees.

6. PRINCIPAL TRANSACTIONS

Citi's Principal transactions revenue consists of realized and unrealized gains and losses from trading activities. Trading activities include revenues from fixed income, equities, credit and commodities products and foreign exchange transactions that are managed on a portfolio basis characterized by primary risk. Not included in the table below is the impact of net interest revenue related to trading activities, which is an integral part of trading activities' profitability. For additional information regarding Principal transactions revenue, see

Note 4 to the Consolidated Financial Statements for information about net interest revenue related to trading activities. Principal transactions include CVA (credit valuation adjustments on derivatives) and FVA (funding valuation adjustments) on over-the-counter derivatives. These adjustments are discussed further in Note 24 to the Consolidated Financial Statements.

The following table presents Principal transactions revenue:

In millions of dollars	2018	2017	2016
Interest rate risks[(1)]	$5,186	$5,301	$4,229
Foreign exchange risks[(2)]	1,423	2,435	1,699
Equity risks[(3)]	1,346	525	330
Commodity and other risks[(4)]	662	425	899
Credit products and risks[(5)]	445	789	700
Total	$9,062	$9,475	$7,857

(1) Includes revenues from government securities and corporate debt, municipal securities, mortgage securities and other debt instruments. Also includes spot and forward trading of currencies and exchange-traded and over-the-counter (OTC) currency options, options on fixed income securities, interest rate swaps, currency swaps, swap options, caps and floors, financial futures, OTC options and forward contracts on fixed income securities.

(2) Includes revenues from foreign exchange spot, forward, option and swap contracts, as well as foreign currency translation (FX translation) gains and losses.

(3) Includes revenues from common, preferred and convertible preferred stock, convertible corporate debt, equity-linked notes and exchange-traded and OTC equity options and warrants.

(4) Primarily includes revenues from crude oil, refined oil products, natural gas and other commodities trades.

(5) Includes revenues from structured credit products.

7. INCENTIVE PLANS

Discretionary Annual Incentive Awards

Citigroup grants immediate cash bonus payments and various forms of immediate and deferred awards as part of its discretionary annual incentive award program involving a large segment of Citigroup's employees worldwide. Most of the shares of common stock issued by Citigroup as part of its equity compensation programs are to settle the vesting of the stock components of these awards.

Discretionary annual incentive awards are generally awarded in the first quarter of the year based on the previous year's performance. Awards valued at less than U.S. $100,000 (or the local currency equivalent) are generally paid entirely in the form of an immediate cash bonus. Pursuant to Citigroup policy and/or regulatory requirements, certain employees and officers are subject to mandatory deferrals of incentive pay and generally receive 25%–60% of their awards in a combination of restricted or deferred stock, deferred cash stock units or deferred cash. Discretionary annual incentive awards to many employees in the EU are subject to deferral requirements regardless of the total award value, with at least 50% of the immediate incentive delivered in the form of a stock payment award subject to a restriction on sale or transfer (generally, for 12 months).

Deferred annual incentive awards may be delivered in the form of one or more award types: a restricted or deferred stock award under Citi's Capital Accumulation Program (CAP), or a deferred cash stock unit award and/or a deferred cash award under Citi's Deferred Cash Award Plan. The applicable mix of awards may vary based on the employee's minimum deferral requirement and the country of employment.

Subject to certain exceptions (principally, for retirement-eligible employees), continuous employment within Citigroup is required to vest in CAP, deferred cash stock unit and deferred cash awards. Post employment vesting by retirement-eligible employees and participants who meet other conditions is generally conditioned upon their refraining from competition with Citigroup during the remaining vesting period, unless the employment relationship has been terminated by Citigroup under certain conditions.

Generally, the deferred awards vest in equal annual installments over three- or four-year periods. Vested CAP awards are delivered in shares of common stock. Deferred cash awards are payable in cash and, except as prohibited by applicable regulatory guidance, earn a fixed notional rate of interest that is paid only if and when the underlying principal award amount vests. Deferred cash stock unit awards are payable in cash at the vesting value of the underlying stock. Generally, in the EU, vested CAP shares are subject to a restriction on sale or transfer after vesting, and vested deferred cash awards and deferred cash stock units are subject to hold back (generally, for 12 months in each case).

Unvested CAP, deferred cash stock units and deferred cash awards are subject to one or more clawback provisions that apply in certain circumstances, including gross misconduct. CAP and deferred cash stock unit awards, made to certain employees, are subject to a formulaic performance-based vesting condition pursuant to which amounts otherwise

scheduled to vest will be reduced based on the amount of any pretax loss in the participant's business in the calendar year preceding the scheduled vesting date. A minimum reduction of 20% applies for the first dollar of loss for CAP and deferred cash stock unit awards.

In addition, deferred cash awards are subject to a discretionary performance-based vesting condition under which an amount otherwise scheduled to vest may be reduced in the event of a "material adverse outcome" for which a participant has "significant responsibility." These awards are also subject to an additional clawback provision pursuant to which unvested awards may be canceled if the employee engaged in misconduct or exercised materially imprudent judgment, or failed to supervise or escalate the behavior of other employees who did.

Sign-on and Long-Term Retention Awards

Stock awards and deferred cash awards may be made at various times during the year as sign-on awards to induce new hires to join Citi or to high-potential employees as long-term retention awards.

Vesting periods and other terms and conditions pertaining to these awards tend to vary by grant. Generally, recipients must remain employed through the vesting dates to vest in the awards, except in cases of death, disability or

involuntary termination other than for gross misconduct. These awards do not usually provide for post employment vesting by retirement-eligible participants.

Outstanding (Unvested) Stock Awards

A summary of the status of unvested stock awards granted as discretionary annual incentive or sign-on and long-term retention awards is presented below:

Unvested stock awards	Shares	Weighted-average grant date fair value per share
Unvested at December 31, 2017	36,931,040	$ 47.89
Granted[1]	12,896,599	73.87
Canceled	(1,315,456)	54.50
Vested[2]	(16,783,587)	49.54
Unvested at December 31, 2018	31,728,596	$ 57.30

(1) The weighted-average fair value of the shares granted during 2017 and 2016 was $59.12 and $37.35, respectively.
(2) The weighted-average fair value of the shares vesting during 2018 was approximately $77.65 per share.

Total unrecognized compensation cost related to unvested stock awards was $538 million at December 31, 2018. The cost is expected to be recognized over a weighted-average period of 1.7 years.

Performance Share Units

Certain executive officers were awarded a target number of performance share units (PSUs) each February from 2015 to 2018, for performance in the year prior to the award date. For grants prior to 2016, PSUs will be earned only to the extent that Citigroup attains specified performance goals relating to Citigroup's return on assets and relative total shareholder return against peers over the three-year period beginning with the year of award. The actual dollar amounts ultimately earned could vary from zero, if performance goals are not met, to as much as 150% of target, if performance goals are meaningfully exceeded.

The PSUs granted in February 2016 are earned over a three-year performance period based on Citigroup's relative total shareholder return as compared to peers. The actual dollar amounts ultimately earned could vary from zero, if performance goals are not met, to as much as 150% of target, if performance goals are meaningfully exceeded.

The PSUs granted in February 2017 are earned over a three-year performance period based half on return on tangible common equity performance in 2019, and the remaining half on cumulative earnings per share over 2017 to 2019.

The PSUs granted in February 2018 are earned over a three-year performance period based half on return on tangible common equity performance in 2020, and the remaining half on cumulative earnings per share over 2018 to 2020.

For the PSUs awarded in 2016, 2017 and 2018, if the total shareholder return is negative over the three-year performance period, executives may earn no more than 100% of the target PSUs, regardless of the extent to which Citi outperforms peer firms.

For all award years, the value of each PSU is equal to the value of one share of Citi common stock. Dividend equivalents will be accrued and paid on the number of earned PSUs after the end of the performance period.

PSUs are subject to variable accounting, pursuant to which the associated value of the award will fluctuate with changes in Citigroup's stock price and the attainment of the specified performance goals for each award, until the award is settled solely in cash after the end of the performance period. The value of the award, subject to the performance goals, is estimated using a simulation model that incorporates multiple valuation assumptions, including the probability of achieving the specified performance goals of each award. The risk-free rate used in the model is based on the applicable U.S. Treasury yield curve. Other significant assumptions for the awards are as follows:

Valuation assumptions	2018	2017	2016
Expected volatility	24.93%	25.79%	24.37%
Expected dividend yield	1.75	1.30	0.40

A summary of the performance share unit activity for 2018 is presented below:

Performance share units	Units	Weighted-average grant date fair value per unit
Outstanding, beginning of period	1,786,726	$ 40.94
Granted[(1)]	495,099	83.24
Canceled	(25,160)	44.07
Payments	(488,304)	44.07
Outstanding, end of period	1,768,362	$ 51.88

(1) The weighted-average grant date fair value per unit awarded in 2017 and 2016 was $59.22 and $27.03, respectively.

PSUs granted in 2015 and 2017 were equitably adjusted after the enactment of Tax Reform, as required under the terms of those awards. The adjustments were intended to reproduce the expected value of the awards immediately prior to the passage of Tax Reform. The PSUs granted in 2016 were not impacted by Tax Reform.

Stock Option Programs

All outstanding stock options are fully vested, with the related expense recognized as a charge to income in prior periods. Generally, the stock options outstanding have a six-year term, with some stock options subject to various transfer restrictions.

The following table presents information with respect to stock option activity under Citigroup's stock option programs:

	2018			2017			2016		
	Options	Weighted-average exercise price	Intrinsic value per share	Options	Weighted-average exercise price	Intrinsic value per share	Options	Weighted-average exercise price	Intrinsic value per share
Outstanding, beginning of period	1,138,813	$ 161.96	$ —	1,527,396	$ 131.78	$ —	6,656,588	$ 67.92	$ —
Canceled	—	—	—	—	—	—	(25,334)	40.80	—
Expired	(376,588)	283.63	—	—	—	—	(2,613,909)	48.80	—
Exercised	—	—	—	(388,583)	43.35	15.67	(2,489,949)	49.10	6.60
Outstanding, end of period	762,225	$ 101.84	$ —	1,138,813	$ 161.96	$ —	1,527,396	$ 131.78	$ —
Exercisable, end of period	762,225			1,138,813			1,527,396		

The following table summarizes information about stock options outstanding under Citigroup's stock option programs at December 31, 2018:

	Options outstanding			Options exercisable	
Range of exercise prices	Number outstanding	Weighted-average contractual life remaining	Weighted-average exercise price	Number exercisable	Weighted-average exercise price
$39.00–$99.99	312,309	2.1 years	$ 43.56	312,309	$ 43.56
$100.00–$199.99	449,916	0.0 years	142.30	449,916	142.30
Total at December 31, 2018	762,225	0.9 years	$ 101.84	762,225	$ 101.84

Other Variable Incentive Compensation

Citigroup has various incentive plans globally that are used to motivate and reward performance primarily in the areas of sales, operational excellence and customer satisfaction. Participation in these plans is generally limited to employees who are not eligible for discretionary annual incentive awards. Other forms of variable compensation include monthly commissions paid to financial advisors and mortgage loan officers.

Summary

Except for awards subject to variable accounting, the total expense recognized for stock awards represents the grant date fair value of such awards, which is generally recognized as a charge to income ratably over the vesting period, other than for awards to retirement-eligible employees and immediately vested awards. Whenever awards are made or are expected to be made to retirement-eligible employees, the charge to income is accelerated based on when the applicable conditions to retirement eligibility were or will be met. If the employee is retirement eligible on the grant date, or the award is vested at the grant date, the entire expense is recognized in the year prior to grant.

Recipients of Citigroup stock awards generally do not have any stockholder rights until shares are delivered upon vesting or exercise, or after the expiration of applicable required holding periods. Recipients of restricted or deferred stock awards and deferred cash stock unit awards, however, may, except as prohibited by applicable regulatory guidance, be entitled to receive dividends or dividend-equivalent payments during the vesting period. Recipients of restricted stock awards generally are entitled to vote the shares in their

award during the vesting period. Once a stock award vests, the shares are freely transferable, unless they are subject to a restriction on sale or transfer for a specified period.

All equity awards granted since April 19, 2005 have been made pursuant to stockholder-approved stock incentive plans that are administered by the Personnel and Compensation Committee of the Citigroup Board of Directors, which is composed entirely of independent non-employee directors.

At December 31, 2018, approximately 42.4 million shares of Citigroup common stock were authorized and available for grant under Citigroup's 2014 Stock Incentive Plan, the only plan from which equity awards are currently granted. The 2014 Stock Incentive Plan and predecessor plans permit the use of treasury stock or newly issued shares in connection with awards granted under the plans. Treasury shares were used to settle vestings from 2016 to 2018, and for the first quarter of 2019, except where local laws favor newly issued shares. The use of treasury stock or newly issued shares to settle stock awards does not affect the compensation expense recorded in the Consolidated Statement of Income for equity awards.

Incentive Compensation Cost

The following table shows components of compensation expense, relating to certain of the incentive compensation programs described above:

In millions of dollars	2018	2017	2016
Charges for estimated awards to retirement-eligible employees	$669	$659	$555
Amortization of deferred cash awards, deferred cash stock units and performance stock units	202	354	336
Immediately vested stock award expense[1]	75	70	73
Amortization of restricted and deferred stock awards[2]	435	474	509
Other variable incentive compensation	640	694	710
Total	$2,021	$2,251	$2,183

(1) Represents expense for immediately vested stock awards that generally were stock payments in lieu of cash compensation. The expense is generally accrued as cash incentive compensation in the year prior to grant.

(2) All periods include amortization expense for all unvested awards to non-retirement-eligible employees.

8. RETIREMENT BENEFITS

Pension and Postretirement Plans

The Company has several non-contributory defined benefit pension plans covering certain U.S. employees and has various defined benefit pension and termination indemnity plans covering employees outside the U.S.

The U.S. qualified defined benefit plan was frozen effective January 1, 2008 for most employees. Accordingly, no additional compensation-based contributions have been credited to the cash balance portion of the plan for existing plan participants after 2007. However, certain employees covered under the prior final pay plan formula continue to accrue benefits. The Company also offers postretirement health care and life insurance benefits to certain eligible U.S. retired employees, as well as to certain eligible employees outside the U.S.

The Company also sponsors a number of non-contributory, nonqualified pension plans. These plans, which are unfunded, provide supplemental defined pension benefits to certain U.S.

employees. With the exception of certain employees covered under the prior final pay plan formula, the benefits under these plans were frozen in prior years.

The plan obligations, plan assets and periodic plan expense for the Company's most significant pension and postretirement benefit plans (Significant Plans) are measured and disclosed quarterly, instead of annually. The Significant Plans captured approximately 90% of the Company's global pension and postretirement plan obligations as of December 31, 2018. All other plans (All Other Plans) are measured annually with a December 31 measurement date.

Net (Benefit) Expense

The following table summarizes the components of net (benefit) expense recognized in the Consolidated Statement of Income for the Company's pension and postretirement plans, for Significant Plans and All Other Plans:

	Pension plans						Postretirement benefit plans					
	U.S. plans			Non-U.S. plans			U.S. plans			Non-U.S. plans		
In millions of dollars	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016
Benefits earned during the year	$1	$3	$4	$146	$153	$154	$—	$—	$—	$9	$9	$10
Interest cost on benefit obligation	514	533	548	292	295	282	26	26	25	102	101	94
Expected return on plan assets	(844)	(865)	(886)	(291)	(299)	(287)	(14)	(6)	(9)	(88)	(89)	(86)
Amortization of unrecognized												
Prior service cost (benefit)	2	2	2	(4)	(3)	(1)	—	—	—	(10)	(10)	(10)
Net actuarial loss (gain)	165	173	169	53	61	69	(1)	—	(1)	29	35	30
Curtailment loss (gain)[1]	1	6	13	(1)	—	(2)	—	—	—	—	—	—
Settlement loss[1]	—	—	—	7	12	6	—	—	—	—	—	—
Total net (benefit) expense	$(161)	$(148)	$(150)	$202	$219	$221	$11	$20	$15	$42	$46	$38

(1) Losses and gains due to curtailment and settlement relate to repositioning and divestiture actions.

Contributions

The Company's funding practice for U.S. and non-U.S. pension and postretirement plans is generally to fund to minimum funding requirements in accordance with applicable local laws and regulations. The Company may increase its contributions above the minimum required contribution, if appropriate. In addition, management has the ability to change its funding practices. For the U.S. pension plans, there were no required minimum cash contributions for 2018 or 2017.

The following table summarizes the actual Company contributions for the years ended December 31, 2018 and 2017, as well as estimated expected Company contributions for 2019. Expected contributions are subject to change, since contribution decisions are affected by various factors, such as market performance, tax considerations and regulatory

requirements.

	Pension plans[1]						Postretirement benefit plans[1]					
	U.S. plans[2]			Non-U.S. plans			U.S. plans			Non-U.S. plans		
In millions of dollars	2019	2018	2017	2019	2018	2017	2019	2018	2017	2019	2018	2017
Contributions made by the Company	$ —	$ —	$ 50	$ 97	$ 140	$ 90	$ —	$ 145	$ 140	$ 4	$ 3	$ 4
Benefits paid directly by the Company	57	55	55	47	42	45	6	5	36	6	6	5

(1) Amounts reported for 2019 are expected amounts.
(2) The U.S. pension plans include benefits paid directly by the Company for the nonqualified pension plans.

Funded Status and Accumulated Other Comprehensive Income (AOCI)

The following tables summarize the funded status and amounts recognized in the Consolidated Balance Sheet for the Company's pension and postretirement plans:

	Pension plans				Postretirement benefit plans			
	U.S. plans		Non-U.S. plans		U.S. plans		Non-U.S. plans	
In millions of dollars	2018	2017	2018	2017	2018	2017	2018	2017
Change in projected benefit obligation								
Projected benefit obligation at beginning of year	$14,040	$14,000	$7,433	$6,522	$699	$686	$1,261	$1,141
Benefits earned during the year	1	3	146	153	—	—	9	9
Interest cost on benefit obligation	514	533	292	295	26	26	102	101
Plan amendments	—	—	7	4	—	—	—	—
Actuarial (gain) loss	(1,056)	536	(99)	127	(1)	43	(123)	19
Benefits paid, net of participants' contributions and government subsidy[1]	(845)	(769)	(293)	(278)	(62)	(56)	(68)	(64)
Divestitures	—	—	—	(29)	—	—	—	(4)
Settlement gain[2]	—	—	(121)	(192)	—	—	—	—
Curtailment loss (gain)[2]	1	6	(1)	(3)	—	—	—	—
Foreign exchange impact and other[3]	—	(269)	(215)	834	—	—	(22)	59
Projected benefit obligation at year end	$12,655	$14,040	$7,149	$7,433	$662	$699	$1,159	$1,261
Change in plan assets								
Plan assets at fair value at beginning of year	$12,725	$12,363	$7,128	$6,149	$262	$129	$1,119	$1,015
Actual return on plan assets	(445)	1,295	(11)	462	(5)	13	(26)	113
Company contributions	55	105	182	135	150	176	9	9
Benefits paid, net of participants' contributions and government subsidy[1]	(845)	(769)	(293)	(278)	(62)	(56)	(68)	(64)
Divestitures	—	—	—	(31)	—	—	—	—
Settlement[2]	—	—	(121)	(192)	—	—	—	—
Foreign exchange impact and other[3]	—	(269)	(186)	883	—	—	2	46
Plan assets at fair value at year end	$11,490	$12,725	$6,699	$7,128	$345	$262	$1,036	$1,119
Funded status of the plans								
Qualified plans[4]	$(483)	$(565)	$(450)	$(305)	$(317)	$(437)	$(123)	$(142)
Nonqualified plans[5]	(682)	(750)	—	—	—	—	—	—
Funded status of the plans at year end	$(1,165)	$(1,315)	$(450)	$(305)	$(317)	$(437)	$(123)	$(142)
Net amount recognized								
Qualified plans								
Benefit asset	$—	$—	$806	$900	$—	$—	$175	$181
Benefit liability	(483)	(565)	(1,256)	(1,205)	(317)	(437)	(298)	(323)
Qualified plans	$(483)	$(565)	$(450)	$(305)	$(317)	$(437)	$(123)	$(142)
Nonqualified plans	(682)	(750)	—	—	—	—	—	—
Net amount recognized on the balance sheet	$(1,165)	$(1,315)	$(450)	$(305)	$(317)	$(437)	$(123)	$(142)
Amounts recognized in AOCI								
Net transition obligation	$—	$—	$(1)	$(1)	$—	$—	$—	$—
Prior service benefit	(13)	(15)	12	22	—	—	83	92
Net actuarial (loss) gain	(6,892)	(6,823)	(1,420)	(1,318)	53	72	(340)	(382)
Net amount recognized in equity (pretax)	$(6,905)	$(6,838)	$(1,409)	$(1,297)	$53	$72	$(257)	$(290)
Accumulated benefit obligation at year end	$12,646	$14,034	$6,720	$7,038	$662	$699	$1,159	$1,261

(1)

U.S. Postretirement benefit plans was net of Employer Group Waiver Plan subsidy of $15 million in 2018 and 2017.

(2) Curtailment and settlement (gains) losses relate to repositioning and divestiture activities.

(3) With respect to the U.S. Plan, de-risking activities during 2017 resulted in a reduction to plan obligations and assets.

(4) The U.S. qualified pension plan is fully funded under specified Employee Retirement Income Security Act (ERISA) funding rules as of January 1, 2019 and no minimum required funding is expected for 2019.

(5) The nonqualified plans of the Company are unfunded.

The following table shows the change in AOCI related to the Company's pension, postretirement and post employment plans:

In millions of dollars	2018	2017	2016
Beginning of year balance, net of tax[1][2]	$(6,183)	$(5,164)	$(5,116)
Actuarial assumptions changes and plan experience	1,288	(760)	(854)
Net asset (loss) gain due to difference between actual and expected returns	(1,732)	625	400
Net amortization	214	229	232
Prior service (cost) credit	(7)	(4)	28
Curtailment/settlement gain[3]	7	17	17
Foreign exchange impact and other	136	(93)	99
Impact of Tax Reform[4]	—	(1,020)	—
Change in deferred taxes, net	20	(13)	30
Change, net of tax	$(74)	$(1,019)	$(48)
End of year balance, net of tax[1][2]	$(6,257)	$(6,183)	$(5,164)

(1) See Note 19 to the Consolidated Financial Statements for further discussion of net AOCI balance.

(2) Includes net-of-tax amounts for certain profit sharing plans outside the U.S.

(3) Curtailment and settlement relate to repositioning and divestiture activities.

(4) In the fourth quarter of 2017, Citi adopted ASU 2018-02, which transferred these amounts from AOCI to Retained earnings. See Note 1 to the Consolidated Financial Statements.

At December 31, 2018 and 2017, the aggregate projected benefit obligation (PBO), the aggregate accumulated benefit obligation (ABO) and the aggregate fair value of plan assets are presented for all defined benefit pension plans with a PBO in excess of plan assets and for all defined benefit pension plans with an ABO in excess of plan assets as follows:

	PBO exceeds fair value of plan assets				ABO exceeds fair value of plan assets			
	U.S. plans[1]		Non-U.S. plans		U.S. plans[1]		Non-U.S. plans	
In millions of dollars	2018	2017	2018	2017	2018	2017	2018	2017
Projected benefit obligation	$ 12,655	$ 14,040	$ 3,904	$ 2,721	$12,655	$14,040	$3,718	$2,596
Accumulated benefit obligation	12,646	14,034	3,528	2,381	12,646	14,034	3,387	2,296
Fair value of plan assets	11,490	12,725	2,648	1,516	11,490	12,725	2,478	1,407

(1) At December 31, 2018 and 2017, for both the U.S. qualified plan and nonqualified plans, the aggregate PBO and the aggregate ABO exceeded plan assets.

Plan Assumptions

The Company utilizes a number of assumptions to determine plan obligations and expenses. Changes in one or a combination of these assumptions will have an impact on the Company's pension and postretirement PBO, funded status and (benefit) expense. Changes in the plans' funded status resulting from changes in the PBO and fair value of plan assets will have a corresponding impact on Accumulated other comprehensive income (loss).

The actuarial assumptions at the respective years ended December 31 in the table below are used to measure the year-end PBO and the net periodic (benefit) expense for the subsequent year (period). Since Citi's Significant Plans are measured on a quarterly basis, the year-end rates for those plans are used to calculate the net periodic (benefit) expense for the subsequent year's first quarter. As a result of the quarterly measurement process, the net periodic (benefit) expense for the Significant Plans is calculated at each respective quarter end based on the preceding quarter-end rates (as shown below for the U.S. and non-U.S. pension and postretirement plans). The actuarial assumptions for All Other Plans are measured annually.

Certain assumptions used in determining pension and postretirement benefit obligations and net benefit expense for the Company's plans are shown in the following table:

At year end	2018	2017
Discount rate		
U.S. plans		
Qualified pension	4.25%	3.60%
Nonqualified pension	4.25	3.60
Postretirement	4.20	3.50
Non-U.S. pension plans		
Range	0.25 to 12.00	0.00 to 10.20
Weighted average	4.47	4.17
Non-U.S. postretirement plans		
Range	1.75 to 10.75	1.75 to 10.10
Weighted average	9.05	8.10
Future compensation increase rate[(1)]		
Non-U.S. pension plans		
Range	1.30 to 13.67	1.17 to 13.67
Weighted average	3.16	3.08
Expected return on assets		
U.S. plans		
Qualified pension	6.70	6.80
Postretirement[(2)]	6.70/3.00	6.80/3.00
Non-U.S. pension plans		
Range	1.00 to 11.50	0.00 to 11.50
Weighted average	4.30	4.52
Non-U.S. postretirement plans		
Range	8.00 to 9.20	8.00 to 9.80
Weighted average	8.01	8.01

(1) Not material for U.S. plans.

(2) The expected rate of return for the VEBA Trust was 3.00%.

During the year	2018	2017	2016
Discount rate			
U.S. plans			
Qualified pension	3.60%/3.95%/ 4.25%/4.30%	4.10%/4.05%/ 3.80%/3.75%	4.40%/3.95%/ 3.65%/3.55%

Nonqualified pension	3.60/3.95/ 4.25/4.30	4.00/3.95/ 3.75/3.65	4.35/3.90/ 3.55/3.45
Postretirement	3.50/3.90/ 4.20/4.20	3.90/3.85/ 3.60/3.55	4.20/3.75/ 3.40/3.30
Non-U.S. pension plans[1]			
Range	0.00 to 10.75	0.25 to 72.50	0.25 to 42.00
Weighted average	4.17	4.40	4.76
Non-U.S. postretirement plans[1]			
Range	1.75 to 10.10	1.75 to 11.05	2.00 to 13.20
Weighted average	8.10	8.27	7.90
Future compensation increase rate[2]			
Non-U.S. pension plans[1]			
Range	1.17 to 13.67	1.25 to 70.00	1.00 to 40.00
Weighted average	3.08	3.21	3.24
Expected return on assets			
U.S. plans			
Qualified pension[3]	6.80/6.70	6.80	7.00
Postretirement[3][4]	6.80/6.70/3.00	6.80	7.00
Non-U.S. pension plans[1]			
Range	0.00 to 11.60	1.00 to 11.50	1.60 to 11.50
Weighted average	4.52	4.55	4.95
Non-U.S. postretirement plans[1]			
Range	8.00 to 9.80	8.00 to 10.30	8.00 to 10.70
Weighted average	8.01	8.02	8.01

(1) Reflects rates utilized to determine the quarterly expense for Significant non-U.S. pension and postretirement plans.

(2) Not material for U.S. plans.

(3) The expected rate of return for the U.S. pension and postretirement plans was lowered from 6.80% to 6.70% effective in the second quarter of 2018 to reflect a change in target asset allocation.

(4) In 2017, the VEBA Trust was funded with an expected rate of return on assets of 3.00%.

Discount Rate

The discount rates for the U.S. pension and postretirement plans were selected by reference to a Citigroup-specific analysis using each plan's specific cash flows and compared with high-quality corporate bond indices for reasonableness. The discount rates for the non-U.S. pension and postretirement plans are selected by reference to high-quality corporate bond rates in countries that have developed corporate bond markets. However, where developed corporate bond markets do not exist, the discount rates are selected by reference to local government bond rates with a premium added to reflect the additional risk for corporate bonds in certain countries.

The established rounding convention is to the nearest 5 bps for the top five non-U.S. countries, and 25 bps for all other countries.

Expected Rate of Return

The Company determines its assumptions for the expected rate of return on plan assets for its U.S. pension and postretirement plans using a "building block" approach, which focuses on ranges of anticipated rates of return for each asset class. A weighted average range of nominal rates is then determined based on target allocations to each asset class. Market performance over a number of earlier years is evaluated covering a wide range of economic conditions to determine whether there are sound reasons for projecting any past trends.

The Company considers the expected rate of return to be a long-term assessment of return expectations and does not anticipate changing this assumption unless there are significant changes in investment strategy or economic conditions. This contrasts with the selection of the discount rate and certain other assumptions, which are reconsidered annually (or quarterly for the Significant Plans) in accordance with GAAP.

The expected rate of return for the U.S. pension and postretirement plans was 6.70% at December 31, 2018 and 6.80% at December 31, 2017 and 2016. The expected return on assets reflects the expected annual appreciation of the plan assets and reduces the Company's annual pension expense. The expected return on assets is deducted from the sum of service cost, interest cost and other components of pension expense to arrive at the net pension (benefit) expense. Net pension (benefit) expense for the U.S. pension plans for 2018, 2017 and 2016 reflects deductions of $844 million, $865 million and $886 million of expected returns, respectively.

The following table shows the expected rates of return used in determining the Company's pension expense compared to the actual rate of return on plan assets during 2018, 2017 and 2016 for the U.S. pension and postretirement plans:

U.S. plans	2018	2017	2016
Expected rate of return			
U.S. pension and postretirement trust	6.80%/6.70%	6.80%	7.00%
VEBA trust[1]	3.00	3.00	—
Actual rate of return[2]			
U.S. pension and postretirement trust	-3.40	10.90	4.90
VEBA trust[1]	0.43 to 1.41	—	—

(1) In December 2017, the VEBA Trust was funded for postretirement benefits with an expected rate of return on assets of 3.00%.

(2) Actual rates of return are presented net of fees.

For the non-U.S. pension plans, pension expense for 2018 was reduced by the expected return of $291 million, compared with the actual return of $(11) million. Pension expense for 2017 and 2016 was reduced by expected returns of $299 million and $287 million, respectively.

Mortality Tables

At December 31, 2018, the Company maintained the Retirement Plan 2014 (RP-2014) mortality table and adopted the Mortality Projection 2018 (MP-2018) projection table for the U.S. plans.

U.S. plans	2018[1]	2017[2]
Mortality		
Pension	RP-2014/MP-2018	RP-2014/MP-2017

Postretirement	RP-2014/MP-2018	RP-2014/MP-2017

(1) The RP-2014 table is the white-collar RP-2014 table. The MP-2018 projection scale is projected from 2006, with convergence to 0.75% ultimate rate of annual improvement by 2034.

(2) The RP-2014 table is the white-collar RP-2014 table, The MP-2017 projection scale is projected from 2006, with convergence to 0.75% ultimate rate of annual improvement by 2033.

Sensitivities of Certain Key Assumptions

The following tables summarize the effect on pension expense of a one-percentage-point change in the discount rate:

	One-percentage-point increase		
In millions of dollars	2018	2017	2016
U.S. plans	$ 25	$ 29	$ 31
Non-U.S. plans	(22)	(27)	(33)
	One-percentage-point decrease		
In millions of dollars	2018	2017	2016
U.S. plans	$ (37)	$ (44)	$ (47)
Non-U.S. plans	32	41	37

Since the U.S. qualified pension plan was frozen, most of the prospective service cost has been eliminated and the gain/loss amortization period was changed to the life expectancy for inactive participants. As a result, pension expense for the U.S. qualified pension plan is driven more by interest costs than service costs, and an increase in the discount rate would increase pension expense, while a decrease in the discount rate would decrease pension expense.

The following tables summarize the effect on pension expense of a one-percentage-point change in the expected rates of return:

	One-percentage-point increase		
In millions of dollars	2018	2017	2016
U.S. plans	$ (126)	$ (127)	$ (127)
Non-U.S. plans	(64)	(64)	(61)
	One-percentage-point decrease		
In millions of dollars	2018	2017	2016
U.S. plans	$ 126	$ 127	$ 127
Non-U.S. plans	64	64	61

Health Care Cost Trend Rate

Assumed health care cost trend rates were as follows:

	2018	2017
Health care cost increase rate for U.S. plans		
Following year	7.00%	6.50%
Ultimate rate to which cost increase is assumed to decline	5.00	5.00
Year in which the ultimate rate is reached	2027	2023
Health care cost increase rate for Non-U.S. plans (weighted average)		
Following year	6.90%	6.87%
Ultimate rate to which cost increase is assumed to decline	6.90	6.87
Range of years in which the ultimate rate is reached	2019	2018–2019

Interest Crediting Rate

The Company has cash balance plans and other plans with promised interest crediting rates. For these plans, the interest crediting rates are set in line with plan rules or country legislation and do not change with market conditions.

	Weighted average interest crediting rate		
At year end	2018	2017	2016
U.S. plans	3.25%	2.60%	3.10%
Non-U.S. plans	1.68	1.74	1.75

Plan Assets

Citigroup's pension and postretirement plans' asset allocations for the U.S. plans and the target allocations by asset category based on asset fair values, are as follows:

	Target asset allocation	U.S. pension assets at December 31,				U.S. postretirement assets at December 31,			
Asset category[1]	2019	2018		2017		2018		2017	
Equity securities[2]	0–26%	15	%	20	%	15	%	20	%
Debt securities[3]	35–82	57		48		57		48	
Real estate	0–7	5		5		5		5	
Private equity	0–10	3		3		3		3	
Other investments	0–30	20		24		20		24	
Total		100	%	100	%	100	%	100	%

(1) Asset allocations for the U.S. plans are set by investment strategy, not by investment product. For example, private equities with an underlying investment in real estate are classified in the real estate asset category, not private equity.

(2) Equity securities in the U.S. pension and postretirement plans do not include any Citigroup common stock at the end of 2018 and 2017.

(3) The VEBA Trust for postretirement benefits are primarily invested in debt securities which are not reflected in the table above.

Third-party investment managers and advisors provide their services to Citigroup's U.S. pension and postretirement plans. Assets are rebalanced as the Company's Pension Plan Investment Committee deems appropriate. Citigroup's investment strategy, with respect to its assets, is to maintain a globally diversified investment portfolio across several asset classes that, when combined with Citigroup's contributions to

the plans, will maintain the plans' ability to meet all required benefit obligations.

Citigroup's pension and postretirement plans' weighted-average asset allocations for the non-U.S. plans and the actual ranges, and the weighted-average target allocations by asset category based on asset fair values, are as follows:

	Non-U.S. pension plans						
	Target asset allocation	Actual range at December 31,		Weighted-average at December 31,			
Asset category[1]	2019	2018	2017	2018		2017	
Equity securities	0–63%	0–66%	0–67%	13	%	15	%
Debt securities	0–100	0–100	0–99	80		79	
Real estate	0–15	0–12	0–18	1		1	
Other investments	0–100	0–100	0–100	6		5	
Total				100	%	100	%

(1) Similar to the U.S. plans, asset allocations for certain non-U.S. plans are set by investment strategy, not by investment product.

	Non-U.S. postretirement plans						
	Target asset allocation	Actual range at December 31,		Weighted-average at December 31,			
Asset category[1]	2019	2018	2017	2018		2017	
Equity securities	0–30%	0–35%	0–38%	35	%	38	%
Debt securities	64–100	62–100	58–100	62		58	
Other investments	0–6	0–3	0–4	3		4	
Total				100	%	100	%

(1)

Similar to the U.S. plans, asset allocations for certain non-U.S. plans are set by investment strategy, not by investment product.

Fair Value Disclosure

For information on fair value measurements, including descriptions of Levels 1, 2 and 3 of the fair value hierarchy and the valuation methodology utilized by the Company, see Notes 1 and 24 to the Consolidated Financial Statements. ASU 2015-07 removed the requirement to categorize within the fair value hierarchy investments for which fair value is measured using the NAV per share practical expedient.

Certain investments may transfer between the fair value hierarchy classifications during the year due to changes in valuation methodology and pricing sources.

Plan assets by detailed asset categories and the fair value hierarchy are as follows:

	U.S. pension and postretirement benefit plans[1]			
In millions of dollars	Fair value measurement at December 31, 2018			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 625	$ —	$ —	$ 625
Non-U.S. equities	481	—	—	481
Mutual funds and other registered investment companies	215	—	—	215
Commingled funds	—	1,344	—	1,344
Debt securities	1,346	3,475	—	4,821
Annuity contracts	—	—	1	1
Derivatives	16	252	—	268
Other investments	—	—	127	127
Total investments	$ 2,683	$ 5,071	$ 128	$ 7,882
Cash and short-term investments	$ 93	$ 865	$ —	$ 958
Other investment liabilities	(100)	(254)	—	(354)
Net investments at fair value	$ 2,676	$ 5,682	$ 128	$ 8,486
Other investment receivables redeemed at NAV				$ 80
Securities valued at NAV				3,269
Total net assets				$ 11,835

(1) The investments of the U.S. pension and postretirement plans are commingled in one trust. At December 31, 2018, the allocable interests of the U.S. pension and postretirement plans were 98.0% and 2.0%, respectively. The investments of the VEBA Trust for the postretirement benefits are reflected in the above table.

	U.S. pension and postretirement benefit plans[1]			
In millions of dollars	Fair value measurement at December 31, 2017			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 726	$ —	$ —	$ 726
Non-U.S. equities	821	—	—	821
Mutual funds and other registered investment companies	376	—	—	376
Commingled funds	—	1,184	—	1,184
Debt securities	1,381	3,080	—	4,461
Annuity contracts	—	—	1	1
Derivatives	11	323	—	334

Other investments	—	—	148	148
Total investments	$ 3,315	$ 4,587	$ 149	$ 8,051
Cash and short-term investments	$ 257	$ 1,004	$ —	$ 1,261
Other investment liabilities	(60)	(343)	—	(403)
Net investments at fair value	$ 3,512	$ 5,248	$ 149	$ 8,909
Other investment receivables redeemed at NAV				$ 16
Securities valued at NAV				4,062
Total net assets				$ 12,987

(1) The investments of the U.S. pension and postretirement plans are commingled in one trust. At December 31, 2017, the allocable interests of the U.S. pension and postretirement plans were 99.0% and 1.0%, respectively. The investments of the VEBA Trust for the postretirement benefits are reflected in the above table.

In millions of dollars	Non-U.S. pension and postretirement benefit plans Fair value measurement at December 31, 2018			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 4	$ 9	$ —	$ 13
Non-U.S. equities	100	100	—	200
Mutual funds and other registered investment companies	2,887	63	—	2,950
Commingled funds	21	—	—	21
Debt securities	5,145	1,500	9	6,654
Real estate	—	3	1	4
Annuity contracts	—	1	10	11
Derivatives	—	156	—	156
Other investments	1	—	210	211
Total investments	$ 8,158	$ 1,832	$ 230	$ 10,220
Cash and short-term investments	$ 91	$ 3	$ —	$ 94
Other investment liabilities	(1)	(2,589)	—	(2,590)
Net investments at fair value	$ 8,248	$ (754)	$ 230	$ 7,724
Securities valued at NAV				$ 11
Total net assets				$ 7,735

In millions of dollars	Non-U.S. pension and postretirement benefit plans Fair value measurement at December 31, 2017			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 4	$ 12	$ —	$ 16
Non-U.S. equities	103	122	1	226
Mutual funds and other registered investment companies	3,098	74	—	3,172
Commingled funds	24	—	—	24
Debt securities	3,999	1,555	7	5,561
Real estate	—	3	1	4
Annuity contracts	—	1	9	10
Derivatives	1	3,102	—	3,103
Other investments	1	—	214	215
Total investments	$ 7,230	$ 4,869	$ 232	$ 12,331
Cash and short-term investments	$ 119	$ 3	$ —	$ 122
Other investment liabilities	(2)	(4,220)	—	(4,222)
Net investments at fair value	$ 7,347	$ 652	$ 232	$ 8,231
Securities valued at NAV				$ 16
Total net assets				$ 8,247

Level 3 Rollforward

The reconciliations of the beginning and ending balances during the year for Level 3 assets are as follows:

In millions of dollars	U.S. pension and postretirement benefit plans					
Asset categories	Beginning Level 3 fair value at Dec. 31, 2017	Realized gains (losses)	Unrealized gains (losses)	Purchases, sales and issuances	Transfers in and/or out of Level 3	Ending Level 3 fair value at Dec. 31, 2018
Annuity contracts	$ 1	$ —	$ —	$ —	$ —	$ 1
Other investments	148	(2)	(18)	(1)	—	127
Total investments	$ 149	$ (2)	$ (18)	$ (1)	$ —	$ 128

In millions of dollars	U.S. pension and postretirement benefit plans					
Asset categories	Beginning Level 3 fair value at Dec. 31, 2016	Realized gains (losses)	Unrealized gains (losses)	Purchases, sales and issuances	Transfers in and/or out of Level 3	Ending Level 3 fair value at Dec. 31, 2017
Annuity contracts	$ 1	$ —	$ —	$ —	$ —	$ 1
Other investments	129	—	—	19	—	148
Total investments	$ 130	$ —	$ —	$ 19	$ —	$ 149

In millions of dollars	Non-U.S. pension and postretirement benefit plans				
Asset categories	Beginning Level 3 fair value at Dec. 31, 2017	Unrealized gains (losses)	Purchases, sales and issuances	Transfers in and/or out of Level 3	Ending Level 3 fair value at Dec. 31, 2018
Non-U.S. equities	$ 1	$ —	$ —	$ (1)	$ —
Debt securities	7	(1)	3	—	9
Real estate	1	—	—	—	1
Annuity contracts	9	(1)	1	1	10
Other investments	214	(3)	(1)	—	210
Total investments	$ 232	$ (5)	$ 3	$ —	$ 230

In millions of dollars	Non-U.S. pension and postretirement benefit plans				
Asset categories	Beginning Level 3 fair value at Dec. 31, 2016	Unrealized gains (losses)	Purchases, sales and issuances	Transfers in and/or out of Level 3	Ending Level 3 fair value at Dec. 31, 2017
Non-U.S. equities	$ 1	$ —	$ —	$ —	$ 1
Debt securities	7	—	—	—	7
Real estate	1	—	—	—	1
Annuity contracts	8	1	—	—	9

Other investments	187	31	(4)	— 214
Total investments	$ 204	$ 32	$ (4)	$ — $ 232

Investment Strategy

The Company's global pension and postretirement funds' investment strategy is to invest in a prudent manner for the exclusive purpose of providing benefits to participants. The investment strategies are targeted to produce a total return that, when combined with the Company's contributions to the funds, will maintain the funds' ability to meet all required benefit obligations. Risk is controlled through diversification of asset types and investments in domestic and international equities, fixed income securities and cash and short-term investments. The target asset allocation in most locations outside the U.S. is primarily in equity and debt securities. These allocations may vary by geographic region and country depending on the nature of applicable obligations and various other regional considerations. The wide variation in the actual range of plan asset allocations for the funded non-U.S. plans is a result of differing local statutory requirements and economic conditions. For example, in certain countries local law requires that all pension plan assets must be invested in fixed income investments, government funds or local-country securities.

Significant Concentrations of Risk in Plan Assets

The assets of the Company's pension plans are diversified to limit the impact of any individual investment. The U.S. qualified pension plan is diversified across multiple asset classes, with publicly traded fixed income, hedge funds, publicly traded equity and real estate representing the most significant asset allocations. Investments in these four asset classes are further diversified across funds, managers, strategies, vintages, sectors and geographies, depending on the specific characteristics of each asset class. The pension assets for the Company's non-U.S. Significant Plans are primarily invested in publicly traded fixed income and publicly traded equity securities.

Oversight and Risk Management Practices

The framework for the Company's pension oversight process includes monitoring of retirement plans by plan fiduciaries and/or management at the global, regional or country level, as appropriate. Independent Risk Management contributes to the risk oversight and monitoring for the Company's U.S. qualified pension plan and non-U.S. Significant Pension Plans. Although the specific components of the oversight process are tailored to the requirements of each region, country and plan, the following elements are common to the Company's monitoring and risk management process:

- periodic asset/liability management studies and strategic asset allocation reviews;
- periodic monitoring of funding levels and funding ratios;
- periodic monitoring of compliance with asset allocation guidelines;
- periodic monitoring of asset class and/or investment manager performance against benchmarks; and
- periodic risk capital analysis and stress testing.

Estimated Future Benefit Payments

The Company expects to pay the following estimated benefit payments in future years:

	Pension plans		Postretirement benefit plans	
In millions of dollars	U.S. plans	Non-U.S. plans	U.S. plans	Non-U.S. plans
2019	$ 797	$ 435	$ 62	$ 70
2020	828	417	62	75
2021	847	426	61	80
2022	857	448	59	86
2023	873	471	57	92
2024–2028	4,365	2,557	252	547

Post Employment Plans

The Company sponsors U.S. post employment plans that provide income continuation and health and welfare benefits to certain eligible U.S. employees on long-term disability.

As of December 31, 2018 and 2017, the plans' funded status recognized in the Company's Consolidated Balance Sheet was $(32) million and $(46) million, respectively. The pretax amounts recognized in Accumulated other comprehensive income (loss) as of December 31, 2018 and 2017 were $(15) million and $3 million, respectively. The improvement in funded status as of December 31, 2017 was primarily due to the Company's funding of the VEBA Trust during 2017.

The following table summarizes the components of net expense recognized in the Consolidated Statement of Income for the Company's U.S. post employment plans:

	Net expense		
In millions of dollars	2018	2017	2016
Service-related expense			
Interest cost on benefit obligation	$2	$2	$3
Expected return on plan assets	(1)	—	—
Amortization of unrecognized			
Prior service (benefit) cost	(23)	(31)	(31)
Net actuarial loss	2	2	5
Total service-related benefit	$(20)	$(27)	$(23)
Non-service-related expense	2	30	21
Total net expense (benefit)	$(18)	$3	$(2)

The following table summarizes certain assumptions used in determining the post employment benefit obligations and net benefit expense for the Company's U.S. post employment plans:

	2018	2017
Discount rate	3.95%	3.20%
Expected return on assets	3.00	3.00
Health care cost increase rate		
Following year	7.00	6.50
Ultimate rate to which cost increase is assumed to decline	5.00	5.00
Year in which the ultimate rate is reached	2027	2023

Defined Contribution Plans

The Company sponsors defined contribution plans in the U.S. and in certain non-U.S. locations, all of which are administered in accordance with local laws. The most significant defined contribution plan is the Citi Retirement Savings Plan (formerly known as the Citigroup 401(k) Plan) sponsored by the Company in the U.S.

Under the Citi Retirement Savings Plan, eligible U.S. employees received matching contributions of up to 6% of their eligible compensation for 2018 and 2017, subject to statutory limits. Additionally, for eligible employees whose eligible compensation is $100,000 or less, a fixed contribution of up to 2% of eligible compensation is provided. All Company contributions are invested according to participants' individual elections. The following table summarizes the Company contributions for the defined contribution plans:

	U.S. plans		
In millions of dollars	2018	2017	2016
Company contributions	$396	$383	$371

	Non-U.S. plans		
In millions of dollars	2018	2017	2016
Company contributions	$283	$270	$268

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9. INCOME TAXES

Income Tax Provision

Details of the Company's income tax provision are presented below:

In millions of dollars	2018	2017	2016
Current			
Federal	$834	$332	$1,016
Non-U.S.	4,290	3,910	3,585
State	284	269	384
Total current income taxes	$5,408	$4,511	$4,985
Deferred			
Federal	$(620)	$24,902	$1,280
Non-U.S.	371	(377)	53
State	198	352	126
Total deferred income taxes	$(51)	$24,877	$1,459
Provision for income tax on continuing operations before noncontrolling interests[1]	$5,357	$29,388	$6,444
Provision (benefit) for income taxes on discontinued operations	(18)	7	(22)
Income tax expense (benefit) reported in stockholders' equity related to:			
FX translation	(263)	188	(402)
Investment securities	(346)	(149)	59
Employee stock plans	(2)	(4)	13
Cash flow hedges	(8)	(12)	27
Benefit plans	(20)	13	(30)
FVO DVA	302	(250)	(201)
Excluded fair value hedges	(17)	—	—
Retained earnings[2]	(305)	(295)	—
Income taxes before noncontrolling interests	$4,680	$28,886	$5,888

(1) Includes the effect of securities transactions and other-than-temporary-impairment losses resulting in a provision (benefit) of $104 million and $(32) million in 2018, $272 million and $(22) million in 2017 and $332 million and $(217) million in 2016, respectively.

(2) 2018 reflects the tax effect of the accounting change for ASU 2016-16 and the tax effect of the accounting change for ASU 2018-03, to report the net unrealized gains on former AFS equity securities. 2017 reflects the tax effect of the accounting change for ASU 2017-08. See Note 1 to the Consolidated Financial Statements.

Tax Rate

The reconciliation of the federal statutory income tax rate to the Company's effective income tax rate applicable to income from continuing operations (before noncontrolling interests and the cumulative effect of accounting changes) for each of the periods indicated is as follows:

	2018	2017	2016
Federal statutory rate	21.0 %	35.0 %	35.0 %
State income taxes, net of federal benefit	1.8	1.1	1.8
Non-U.S. income tax rate differential	5.3	(1.6)	(3.6)
Effect of tax law changes[1]	(0.6)	99.7	—
Basis difference in affiliates	(2.4)	(2.1)	(0.1)
Tax advantaged investments	(2.0)	(2.2)	(2.4)
Other, net	(0.3)	(0.8)	(0.7)
Effective income tax rate	22.8 %	129.1 %	30.0 %

(1)

2018 includes one-time Tax Reform benefits of $94 million for amounts that were considered provisional pursuant to SAB 118. 2017 includes the one-time $22,594 million charge for Tax Reform.

As set forth in the table above, Citi's effective tax rate for 2018 was 22.8% (23.3% excluding the effect of provisional amounts pursuant to SAB 118). The rate is lower than the 29.8% reported in 2017 (excluding the one-time impact of Tax Reform) primarily due to the U.S. statutory rate reduction from 35% to 21% as part of Tax Reform.

Deferred Income Taxes

Deferred income taxes at December 31 related to the following:

In millions of dollars	2018	2017
Deferred tax assets		
Credit loss deduction	$3,419	$3,423
Deferred compensation and employee benefits	1,975	1,585
Repositioning and settlement reserves	428	454
U.S. tax on non-U.S. earnings	2,080	2,452
Investment and loan basis differences	4,891	3,384
Cash flow hedges	240	233
Tax credit and net operating loss carry-forwards	20,759	21,575
Fixed assets and leases	1,006	1,090
Other deferred tax assets	2,145	1,988
Gross deferred tax assets	$36,943	$36,184
Valuation allowance	$9,258	$9,387
Deferred tax assets after valuation allowance	$27,685	$26,797
Deferred tax liabilities		
Intangibles	$(975)	$(1,247)
Debt issuances	(530)	(294)
Non-U.S. withholding taxes	(1,040)	(668)
Interest-related items	(594)	(562)
Other deferred tax liabilities	(1,643)	(1,545)
Gross deferred tax liabilities	$(4,782)	$(4,316)
Net deferred tax assets	$22,903	$22,481

Unrecognized Tax Benefits

The following is a rollforward of the Company's unrecognized tax benefits:

In millions of dollars	2018	2017	2016
Total unrecognized tax benefits at January 1	$1,013	$1,092	$1,235
Net amount of increases for current year's tax positions	40	43	34
Gross amount of increases for prior years' tax positions	46	324	273
Gross amount of decreases for prior years' tax positions	(174)	(246)	(225)
Amounts of decreases relating to settlements	(283)	(199)	(174)
Reductions due to lapse of statutes of limitation	(23)	(11)	(21)
Foreign exchange, acquisitions and dispositions	(12)	10	(30)
Total unrecognized tax benefits at December 31	$607	$1,013	$1,092

The total amounts of unrecognized tax benefits at December 31, 2018, 2017 and 2016 that, if recognized, would affect Citi's tax expense, are $0.4 billion, $0.8 billion and $0.8 billion, respectively. The remaining uncertain tax positions have offsetting amounts in other jurisdictions or are temporary differences.

Interest and penalties (not included in "unrecognized tax benefits" above) are a component of Provision for income taxes.

	2018		2017		2016	
In millions of dollars	Pretax	Net of tax	Pretax	Net of tax	Pretax	Net of tax
Total interest and penalties on the Consolidated Balance Sheet at January 1	$121	$101	$260	$ 164	$233	$ 146
Total interest and penalties in the Consolidated Statement of Income	6	6	5	21	105	68
Total interest and penalties on the Consolidated Balance Sheet at December 31[1]	103	85	121	101	260	164

(1) Includes $2 million, $3 million and $3 million for non-U.S. penalties in 2018, 2017 and 2016. Also includes $1 million, $3 million and $3 million for state penalties in 2018, 2017 and 2016.

As of December 31, 2018, Citi was under audit by the Internal Revenue Service and other major taxing jurisdictions around the world. It is thus reasonably possible that significant changes in the gross balance of unrecognized tax benefits may occur within the next 12 months, although Citi does not expect such audits to result in amounts that would cause a significant change to its effective tax rate.

The following are the major tax jurisdictions in which the Company and its affiliates operate and the earliest tax year subject to examination:

Jurisdiction	Tax year
United States	2014
Mexico	2013
New York State and City	2009
United Kingdom	2015
India	2015
Singapore	2011
Hong Kong	2012
Ireland	2014

Non-U.S. Earnings

Non-U.S. pretax earnings approximated $16.1 billion in 2018 (of which a $21 million loss was recorded in Discontinued operations), $13.7 billion in 2017 and $11.6 billion in 2016. As a U.S. corporation, Citigroup and its U.S. subsidiaries are currently subject to U.S. taxation on all non-U.S. pretax earnings of non-U.S. branches. Beginning in 2018, there is a separate foreign tax credit (FTC) basket for branches. Also, dividends from a non-U.S.

subsidiary or affiliate are effectively exempt from U.S. taxation. The Company provides income taxes on the book over tax basis differences of non-U.S. subsidiaries except to the extent that such differences are indefinitely reinvested outside the U.S.

At December 31, 2018, $15.5 billion of basis differences of non-U.S. subsidiaries was indefinitely invested. At the existing tax rates, additional taxes (net of U.S. FTCs) of $4.3 billion would have to be provided if such basis differences were realized.

Income taxes are not provided for the Company's "savings bank base year bad debt reserves" that arose before 1988, because under current U.S. tax rules, such taxes will become payable only to the extent that such amounts are distributed in excess of limits prescribed by federal law. At December 31, 2018, the amount of the base year reserves totaled approximately $358 million (subject to a tax of $75 million).

Deferred Tax Assets

As of December 31, 2018, Citi had a valuation allowance of $9.3 billion, composed of valuation allowances of $6.0 billion on its FTC carry-forwards, $1.7 billion on its U.S. residual DTA related to its non-U.S. branches, $1.5 billion on local non-U.S. DTAs and $0.1 billion on state net operating loss carry-forwards. The valuation allowance against FTCs results from the impact of the lower tax rate and the new separate FTC basket for non-U.S. branches, as well as the diminished ability under Tax Reform to generate income from sources outside the U.S. to support FTC utilization. The absolute amount of Citi's post-Tax Reform-related valuation allowances may change in future years. First, the separate FTC basket for non-U.S. branches will result in additional DTAs (for FTCs) requiring a valuation allowance, given that the local tax rate for these branches exceeds on average the U.S. tax rate of 21%. Second, in Citi's general basket for FTCs, changes in the forecasted amount of income in U.S. locations derived from sources outside the U.S. could alter the amount of valuation allowance that is needed against such FTCs. The following table summarizes Citi's DTAs:

In billions of dollars

Jurisdiction/component[1]	DTAs balance December 31, 2018	DTAs balance December 31, 2017
U.S. federal[2]		
Net operating losses (NOLs)[3]	$ 2.6	$ 2.3
Foreign tax credits (FTCs)	6.8	7.6
General business credits (GBCs)	1.0	1.4
Future tax deductions and credits	6.7	4.8
Total U.S. federal	$ 17.1	$ 16.1
State and local		
New York NOLs	$ 2.0	$ 2.3
Other state NOLs	0.2	0.2
Future tax deductions	1.4	1.3
Total state and local	$ 3.6	$ 3.8
Non-U.S.		
NOLs	$ 0.6	$ 0.6
Future tax deductions	1.6	2.0
Total non-U.S.	$ 2.2	$ 2.6
Total	$ 22.9	$ 22.5

(1) All amounts are net of valuation allowances.

(2) Included in the net U.S. federal DTAs of $17.1 billion as of December 31, 2018 were deferred tax liabilities of $2.8 billion that will reverse in the relevant carry-forward period and may be used to support the DTAs.

(3) Consists of non-consolidated tax return NOL carry-forwards that are eventually expected to be utilized in Citigroup's consolidated tax return.

The following table summarizes the amounts of tax carry-forwards and their expiration dates:

In billions of dollars

Year of expiration	December 31, 2018	December 31, 2017
U.S. tax return foreign tax credit carry-forwards[1]		
2018	$—	$ 0.4
2019	0.9	1.3
2020	2.6	3.2

2021	1.8	2.0
2022	3.3	3.4
2023[2]	0.4	0.4
2025[2]	1.4	1.4
2027[2]	1.1	1.2
2028	1.3	—
Total U.S. tax return foreign tax credit carry-forwards	$12.8	$ 13.3
U.S. tax return general business credit carry-forwards		
2032	$—	$ 0.2
2033	—	0.3
2034	—	0.2
2035	—	0.2
2036	0.1	0.2
2037	0.4	0.3
2038	0.5	—
Total U.S. tax return general business credit carry-forwards	$1.0	$ 1.4
U.S. subsidiary separate federal NOL carry-forwards		
2027	$0.2	$ 0.2
2028	0.1	0.1
2030	0.3	0.3
2032	0.1	0.1
2033	1.6	1.6
2034	2.1	2.3
2035	3.3	3.3
2036	2.1	2.1
2037	1.0	1.0
Unlimited carry-forward period	1.7	—
Total U.S. subsidiary separate federal NOL carry-forwards[3]	$12.5	$ 11.0
New York State NOL carry-forwards[3]		
2034	$11.7	$ 13.6
New York City NOL carry-forwards[3]		
2034	$11.5	$ 13.1
Non-U.S. NOL carry-forwards[1]		
Various	$2.0	$ 2.0

(1) Before valuation allowance.

(2) The $2.9 billion in FTC carry-forwards that expire in 2023, 2025 and 2027 are in a non-consolidated tax return entity but will be utilized (net of valuation allowances) in Citigroup's consolidated tax return.

(3) Pretax.

The time remaining for utilization of the FTC component has shortened, given the passage of time. Although realization is not assured, Citi believes that the realization of the recognized net DTAs of $22.9 billion at December 31, 2018 is more-likely-than-not, based upon expectations as to future

taxable income in the jurisdictions in which the DTAs arise and consideration of available tax planning strategies (as defined in ASC 740, Income Taxes).

Citi believes the U.S. federal and New York State and City NOL carry-forward period of 20 years provides enough time to fully utilize the DTAs pertaining to the existing NOL carry-forwards. This is due to Citi's forecast of sufficient U.S. taxable income and the fact that New York State and City continue to tax Citi's non-U.S. income.

With respect to the FTCs component of the DTAs, the carry-forward period is 10 years. Utilization of FTCs in any year is restricted to 21% of foreign source taxable income in that year. However, overall domestic losses that Citi has incurred of approximately $47 billion as of December 31, 2018 are allowed to be reclassified as foreign source income to the extent of 50%–100% of domestic source income produced in subsequent years. Such resulting foreign source income would cover the FTC carry-forwards after valuation allowance. As noted in the tables above, Citi's FTC carry-forwards were $6.8 billion ($12.8 billion before valuation allowance) as of December 31, 2018, compared to $7.6 billion as of December 31, 2017. Citi believes that it will generate sufficient U.S. taxable income within the 10-year carry-forward period to be able to utilize the net FTCs after the valuation allowance, after considering any FTCs produced in the tax return for such period, which must be used prior to any carry-forward utilization.

10. EARNINGS PER SHARE

The following table reconciles the income and share data used in the basic and diluted earnings per share (EPS) computations:

In millions, except per share amounts	2018	2017	2016
Income (loss) from continuing operations before attribution of noncontrolling interests	$18,088	$(6,627)	$15,033
Less: Noncontrolling interests from continuing operations	35	60	63
Net income (loss) from continuing operations (for EPS purposes)	$18,053	$(6,687)	$14,970
Income (loss) from discontinued operations, net of taxes	(8)	(111)	(58)
Citigroup's net income (loss)	$18,045	$(6,798)	$14,912
Less: Preferred dividends[1]	1,173	1,213	1,077
Net income (loss) available to common shareholders	$16,872	$(8,011)	$13,835
Less: Dividends and undistributed earnings allocated to employee restricted and deferred shares with nonforfeitable rights to dividends, applicable to basic EPS	200	37	195
Net income (loss) allocated to common shareholders for basic and diluted EPS	$16,672	$(8,048)	$13,640
Weighted-average common shares outstanding applicable to basic EPS (in millions)	2,493.3	2,698.5	2,888.1
Effect of dilutive securities			
Options[2]	0.1	—	0.1
Other employee plans	1.4	—	0.1
Adjusted weighted-average common shares outstanding applicable to diluted EPS[3]	2,494.8	2,698.5	2,888.3
Basic earnings per share[4]			
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74
Discontinued operations	—	(0.04)	(0.02)
Net income (loss)	$6.69	$(2.98)	$4.72
Diluted earnings per share[4]			
Income (loss) from continuing operations	$6.69	$(2.94)	$4.74
Discontinued operations	—	(0.04)	(0.02)
Net income (loss)	$6.68	$(2.98)	$4.72

(1) See Note 20 to the Consolidated Financial Statements for the potential future impact of preferred stock dividends.

(2) During 2018, 2017 and 2016, weighted-average options to purchase 0.5 million, 0.8 million and 4.2 million shares of common stock, respectively, were outstanding but not included in the computation of earnings per share because the weighted-average exercise prices of $145.69, $204.80 and $98.01 per share, respectively, were anti-dilutive.

(3) Due to rounding, common shares outstanding applicable to basic EPS and the effect of dilutive securities may not sum to common shares outstanding applicable to diluted EPS.

(4) Due to rounding, earnings per share on continuing operations and discontinued operations may not sum to earnings per share on net income.

11. FEDERAL FUNDS, SECURITIES BORROWED, LOANED AND SUBJECT TO REPURCHASE AGREEMENTS

Federal funds sold and securities borrowed and purchased under agreements to resell, at their respective carrying values, consisted of the following:

In millions of dollars	December 31, 2018	December 31, 2017
Federal funds sold	$—	$—
Securities purchased under agreements to resell	159,364	130,984
Deposits paid for securities borrowed	111,320	101,494
Total[(1)]	$270,684	$232,478

Federal funds purchased and securities loaned and sold under agreements to repurchase, at their respective carrying values, consisted of the following:

In millions of dollars	December 31, 2018	December 31, 2017
Federal funds purchased	$—	$326
Securities sold under agreements to repurchase	166,090	142,646
Deposits received for securities loaned	11,678	13,305
Total[(1)]	$177,768	$156,277

(1) The above tables do not include securities-for-securities lending transactions of $15.9 billion and $14.0 billion at December 31, 2018 and 2017, respectively, where the Company acts as lender and receives securities that can be sold or pledged as collateral. In these transactions, the Company recognizes the securities received at fair value within Other assets and the obligation to return those securities as a liability within Brokerage payables.

The resale and repurchase agreements represent collateralized financing transactions. Citi executes these transactions primarily through its broker-dealer subsidiaries to facilitate customer matched-book activity and to efficiently fund a portion of Citi's trading inventory. Transactions executed by Citi's bank subsidiaries primarily facilitate customer financing activity.

To maintain reliable funding under a wide range of market conditions, including under periods of stress, Citi manages these activities by taking into consideration the quality of the underlying collateral and stipulating financing tenor. Citi manages the risks in its collateralized financing transactions by conducting daily stress tests to account for changes in capacity, tenors, haircut, collateral profile and client actions. Additionally, Citi maintains counterparty diversification by establishing concentration triggers and assessing counterparty reliability and stability under stress.

It is the Company's policy to take possession of the underlying collateral, monitor its market value relative to the amounts due under the agreements and, when necessary,

require prompt transfer of additional collateral in order to maintain contractual margin protection. For resale and repurchase agreements, when necessary, the Company posts additional collateral in order to maintain contractual margin protection.

Collateral typically consists of government and government-agency securities, corporate and municipal bonds, equities and mortgage- and other asset-backed securities.

The resale and repurchase agreements are generally documented under industry standard agreements that allow the prompt close-out of all transactions (including the liquidation of securities held) and the offsetting of obligations to return cash or securities by the non-defaulting party, following a payment default or other type of default under the relevant master agreement. Events of default generally include (i) failure to deliver cash or securities as required under the transaction, (ii) failure to provide or return cash or securities as used for margining purposes, (iii) breach of representation, (iv) cross-default to another transaction entered into among the parties, or, in some cases, their affiliates and (v) a repudiation of obligations under the agreement. The counterparty that receives the securities in

these transactions is generally unrestricted in its use of the securities, with the exception of transactions executed on a tri-party basis, where the collateral is maintained by a custodian and operational limitations may restrict its use of the securities.

A substantial portion of the resale and repurchase agreements is recorded at fair value, as described in Notes 24 and 25 to the Consolidated Financial Statements. The remaining portion is carried at the amount of cash initially advanced or received, plus accrued interest, as specified in the respective agreements.

The securities borrowing and lending agreements also represent collateralized financing transactions similar to the resale and repurchase agreements. Collateral typically consists of government and government-agency securities and corporate debt and equity securities.

Similar to the resale and repurchase agreements, securities borrowing and lending agreements are generally documented under industry standard agreements that allow the prompt close-out of all transactions (including the liquidation of securities held) and the offsetting of obligations to return cash or securities by the non-defaulting party, following a payment default or other default by the other party under the relevant master agreement. Events of default and rights to use securities under the securities borrowing and lending agreements are similar to the resale and repurchase agreements referenced above.

A substantial portion of securities borrowing and lending agreements is recorded at the amount of cash advanced or received. The remaining portion is recorded at fair value as the Company elected the fair value option for certain securities borrowed and loaned portfolios, as described in Note 25 to the Consolidated Financial Statements. With respect to securities loaned, the Company receives cash collateral in an amount generally in excess of the market value of the securities loaned. The Company monitors the market value of securities borrowed and securities loaned on a daily basis and obtains or

posts additional collateral in order to maintain contractual margin protection.

The enforceability of offsetting rights incorporated in the master netting agreements for resale and repurchase agreements, and securities borrowing and lending agreements, is evidenced to the extent that a supportive legal opinion has been obtained from counsel of recognized standing that provides the requisite level of certainty regarding the enforceability of these agreements. Also, the exercise of rights by the non-defaulting party to terminate and close out transactions on a net basis under these agreements will not be stayed or avoided under applicable law upon an event of default including bankruptcy, insolvency or similar proceeding.

A legal opinion may not have been sought or obtained for certain jurisdictions where local law is silent or sufficiently ambiguous to determine the enforceability of offsetting rights or where adverse case law or conflicting regulation may cast

doubt on the enforceability of such rights. In some jurisdictions and for some counterparty types, the insolvency law for a particular counterparty type may be nonexistent or unclear as overlapping regimes may exist. For example, this may be the case for certain sovereigns, municipalities, central banks and U.S. pension plans.

The following tables present the gross and net resale and repurchase agreements and securities borrowing and lending agreements and the related offsetting amount permitted under ASC 210-20-45. The tables also include amounts related to financial instruments that are not permitted to be offset under ASC 210-20-45, but would be eligible for offsetting to the extent that an event of default occurred and a legal opinion supporting enforceability of the offsetting rights has been obtained. Remaining exposures continue to be secured by financial collateral, but the Company may not have sought or been able to obtain a legal opinion evidencing enforceability of the offsetting right.

	As of December 31, 2018				
In millions of dollars	Gross amounts of recognized assets	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of assets included on the Consolidated Balance Sheet[2]	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[3]	Net amounts[4]
Securities purchased under agreements to resell	$246,788	$ 87,424	$ 159,364	$ 124,557	$ 34,807
Deposits paid for securities borrowed	111,320	—	111,320	35,766	75,554
Total	$358,108	$ 87,424	$ 270,684	$ 160,323	$ 110,361

In millions of dollars	Gross amounts of recognized liabilities	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of liabilities included on the Consolidated Balance Sheet[2]	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[3]	Net amounts[4]
Securities sold under agreements to repurchase	$ 253,514	$ 87,424	$ 166,090	$ 82,823	$ 83,267
Deposits received for securities loaned	11,678	—	11,678	3,415	8,263
Total	$ 265,192	$ 87,424	$ 177,768	$ 86,238	$ 91,530

In millions of dollars	As of December 31, 2017 Gross amounts of recognized assets	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of assets included on the Consolidated Balance Sheet[2]	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[3]	Net amounts[4]
Securities purchased under agreements to resell	$204,460	$ 73,476	$ 130,984	$ 103,022	$ 27,962
Deposits paid for securities borrowed	101,494	—	101,494	22,271	79,223
Total	$305,954	$ 73,476	$ 232,478	$ 125,293	$ 107,185

In millions of dollars	Gross amounts of recognized liabilities	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of liabilities included on the Consolidated Balance Sheet[2]	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[3]	Net amounts[4]
Securities sold under agreements to repurchase	$ 216,122	$ 73,476	$ 142,646	$ 73,716	$ 68,930
Deposits received for securities loaned	13,305	—	13,305	4,079	9,226
Total	$ 229,427	$ 73,476	$ 155,951	$ 77,795	$ 78,156

(1) Includes financial instruments subject to enforceable master netting agreements that are permitted to be offset under ASC 210-20-45.

(2) The total of this column for each period excludes federal funds sold/purchased. See tables above.

(3) Includes financial instruments subject to enforceable master netting agreements that are not permitted to be offset under ASC 210-20-45, but would be eligible for offsetting to the extent that an event of default has occurred and a legal opinion supporting enforceability of the offsetting right has been obtained.

(4) Remaining exposures continue to be secured by financial collateral, but the Company may not have sought or been able to obtain a legal opinion evidencing enforceability of the offsetting right.

The following tables present the gross amount of liabilities associated with repurchase agreements and securities lending agreements, by remaining contractual maturity:

	As of December 31, 2018				
In millions of dollars	Open and overnight	Up to 30 days	31–90 days	Greater than 90 days	Total
Securities sold under agreements to repurchase	$108,405	$70,850	$29,898	$44,361	$253,514
Deposits received for securities loaned	6,296	774	2,626	1,982	11,678
Total	$114,701	$71,624	$32,524	$46,343	$265,192

	As of December 31, 2017				
In millions of dollars	Open and overnight	Up to 30 days	31–90 days	Greater than 90 days	Total
Securities sold under agreements to repurchase	$82,073	$68,372	$33,846	$31,831	$216,122
Deposits received for securities loaned	9,946	266	1,912	1,181	13,305
Total	$92,019	$68,638	$35,758	$33,012	$229,427

The following tables present the gross amount of liabilities associated with repurchase agreements and securities lending agreements, by class of underlying collateral:

	As of December 31, 2018		
In millions of dollars	Repurchase agreements	Securities lending agreements	Total
U.S. Treasury and federal agency securities	$86,785	$ 41	$86,826

State and municipal securities	2,605	—	2,605
Foreign government securities	99,131	179	99,310
Corporate bonds	21,719	749	22,468
Equity securities	12,920	10,664	23,584
Mortgage-backed securities	19,421	—	19,421
Asset-backed securities	6,207	—	6,207
Other	4,726	45	4,771
Total	$253,514	$ 11,678	$265,192

In millions of dollars	As of December 31, 2017 Repurchase agreements	Securities lending agreements	Total
U.S. Treasury and federal agency securities	$58,774	$ —	$58,774
State and municipal securities	1,605	—	1,605
Foreign government securities	89,576	105	89,681
Corporate bonds	20,194	657	20,851
Equity securities	20,724	11,907	32,631
Mortgage-backed securities	17,791	—	17,791
Asset-backed securities	5,479	—	5,479
Other	1,979	636	2,615
Total	$216,122	$ 13,305	$229,427

12. BROKERAGE RECEIVABLES AND BROKERAGE PAYABLES

The Company has receivables and payables for financial instruments sold to and purchased from brokers, dealers and customers, which arise in the ordinary course of business. Citi is exposed to risk of loss from the inability of brokers, dealers or customers to pay for purchases or to deliver the financial instruments sold, in which case Citi would have to sell or purchase the financial instruments at prevailing market prices. Credit risk is reduced to the extent that an exchange or clearing organization acts as a counterparty to the transaction and replaces the broker, dealer or customer in question.

Citi seeks to protect itself from the risks associated with customer activities by requiring customers to maintain margin collateral in compliance with regulatory and internal guidelines. Margin levels are monitored daily, and customers deposit additional collateral as required. Where customers cannot meet collateral requirements, Citi may liquidate sufficient underlying financial instruments to bring the customer into compliance with the required margin level.

Exposure to credit risk is impacted by market volatility, which may impair the ability of clients to satisfy their obligations to Citi. Credit limits are established and closely monitored for customers and for brokers and dealers engaged in forwards, futures and other transactions deemed to be credit sensitive.

Brokerage receivables and Brokerage payables consisted of the following:

	December 31,	
In millions of dollars	2018	2017
Receivables from customers	$14,415	$19,215
Receivables from brokers, dealers and clearing organizations	21,035	19,169
Total brokerage receivables[(1)]	$35,450	$38,384
Payables to customers	$40,273	$38,741
Payables to brokers, dealers and clearing organizations	24,298	22,601
Total brokerage payables[(1)]	$64,571	$61,342

(1) Includes brokerage receivables and payables recorded by Citi broker-dealer entities that are accounted for in accordance with the AICPA Accounting Guide for Brokers and Dealers in Securities as codified in ASC 940-320.

13. INVESTMENTS

Overview

Citi adopted ASU 2016-01 and ASU 2018-03 as of January 1, 2018. The ASUs require fair value changes on marketable equity securities to be recognized in earnings. The available-for-sale category was eliminated for equity securities. Also, non-marketable equity securities are required to be measured

at fair value with changes in fair value recognized in earnings unless (i) the measurement alternative is elected or (ii) the investment represents Federal Reserve Bank and Federal Home Loan Bank stock or certain exchange seats that continue to be carried at cost. See Note 1 to the Consolidated Financial Statements for additional details.

The following tables present Citi's investments by category:

In millions of dollars	December 31, 2018
Debt securities available-for-sale (AFS)	$288,038
Debt securities held-to-maturity (HTM)(1)	63,357
Marketable equity securities carried at fair value(2)	220
Non-marketable equity securities carried at fair value(2)	889
Non-marketable equity securities measured using the measurement alternative(3)	538
Non-marketable equity securities carried at cost(4)	5,565
Total investments	$358,607

In millions of dollars	December 31, 2017
Securities available-for-sale (AFS)	$ 290,914
Debt securities held-to-maturity (HTM)(1)	53,320
Non-marketable equity securities carried at fair value(2)	1,206
Non-marketable equity securities carried at cost(4)	6,850
Total investments	$ 352,290

(1) Carried at adjusted amortized cost basis, net of any credit-related impairment.

(2) Unrealized gains and losses are recognized in earnings.

(3) Impairment losses and adjustments to the carrying value as a result of observable price changes are recognized in earnings.

(4) Primarily consists of shares issued by the Federal Reserve Bank, Federal Home Loan Banks and certain exchanges of which Citigroup is a member.

The following table presents interest and dividend income on investments:

In millions of dollars	2018	2017	2016
Taxable interest	$8,704	$7,538	$6,858
Interest exempt from U.S. federal income tax	521	535	549
Dividend income	269	222	175
Total interest and dividend income	$9,494	$8,295	$7,582

The following table presents realized gains and losses on the sale of investments, which excludes OTTI losses:

In millions of dollars	2018	2017	2016
Gross realized investment gains	$682	$1,039	$1,460
Gross realized investment losses	(261)	(261)	(511)
Net realized gains on sale of investments	$421	$778	$949

The Company has sold certain debt securities that were classified as HTM. These sales were in response to significant deterioration in the creditworthiness of the issuers or securities or because the Company has collected a substantial portion (at least 85%) of the principal outstanding at acquisition of the security. In addition, certain other debt securities were reclassified to AFS investments in response to

significant credit deterioration. Because the Company generally intends to sell these reclassified debt securities, Citi recorded OTTI on the securities. The following table presents, for the periods indicated, the carrying value of HTM debt securities sold and reclassified to AFS, as well as the related gain (loss) or the OTTI losses recorded on these securities:

In millions of dollars	2018	2017	2016
Carrying value of HTM debt securities sold	$ 16	$ 81	$49
Net realized gain (loss) on sale of HTM debt securities sold	13	14	
Carrying value of debt securities reclassified to AFS	8	74	150
OTTI losses on debt securities reclassified to AFS	—	—	(6)

Securities Available-for-Sale

The amortized cost and fair value of AFS securities were as follows:

	2018				2017			
In millions of dollars	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Securities AFS								
Mortgage-backed securities[1]								
U.S. government-sponsored agency guaranteed	$43,504	$ 241	$ 725	$43,020	$42,116	$ 125	$ 500	$41,741
Prime	—	—	—	—	11	6	—	17
Alt-A	1	—	—	1	26	90	—	116

Non-U.S. residential	1,310	4	2	1,312	2,744	13	6	2,751
Commercial	173	1	2	172	334	—	2	332
Total mortgage-backed securities	$44,988	$ 246	$ 729	$44,505	$45,231	$ 234	$ 508	$44,957
U.S. Treasury and federal agency securities								
U.S. Treasury	$109,376	$ 33	$ 1,339	$108,070	$108,344	$ 77	$ 971	$107,450
Agency obligations	9,283	1	132	9,152	10,813	7	124	10,696
Total U.S. Treasury and federal agency securities	$118,659	$ 34	$ 1,471	$117,222	$119,157	$ 84	$ 1,095	$118,146
State and municipal[2]	$9,372	$ 96	$ 262	$9,206	$8,870	$ 140	$ 245	$8,765
Foreign government	100,872	415	596	100,691	100,615	508	590	100,533
Corporate	11,714	42	157	11,599	14,144	51	86	14,109
Asset-backed securities[1]	845	2	4	843	3,906	14	2	3,918
Other debt securities	3,973	—	1	3,972	297	—	—	297
Total debt securities AFS	$290,423	$ 835	$ 3,220	$288,038	$292,220	$ 1,031	$ 2,526	$290,725
Marketable equity securities AFS[3]	$—	$ —	$ —	$—	$186	$ 4	$ 1	$189
Total securities AFS	$290,423	$ 835	$ 3,220	$288,038	$292,406	$ 1,035	$ 2,527	$290,914

(1) The Company invests in mortgage- and asset-backed securities. These securitization entities are generally considered VIEs. The Company's maximum exposure to loss from these VIEs is equal to the carrying amount of the securities, which is reflected in the table above. For mortgage- and asset-backed securitizations in which the Company has other involvement, see Note 21 to the Consolidated Financial Statements.

(2) In the second quarter of 2017, Citi early adopted ASU 2017-08, Receivable—Nonrefundable Fees and Other Costs (Subtopic 310-20): Premium Amortization on Purchased Callable Debt Securities. Upon adoption, a cumulative effect adjustment was recorded to reduce Retained earnings, effective January 1, 2017, for the incremental amortization of purchase premiums and cumulative fair value hedge adjustments on callable state and municipal debt securities. See Note 1 to the Consolidated Financial Statements.

(3) Citi adopted ASU 2016-01 and ASU 2018-03 as of January 1, 2018, resulting in a cumulative effect adjustment from AOCI to Retained earnings for net unrealized gains on marketable equity securities AFS. The AFS category was eliminated for equity securities effective January 1, 2018. See Note 1 to the Consolidated Financial Statements for additional details.

At December 31, 2018, the amortized cost of fixed income securities exceeded their fair value by $3,220 million. Of the $3,220 million, $752 million represented unrealized losses on fixed income investments that have been in a gross-unrealized-loss position for less than a year and, of these, 92% were rated investment grade; and $2,468 million

represented unrealized losses on fixed income investments that have been in a gross-unrealized-loss position for a year or more and, of these, 98% were rated investment grade. Of the $2,468 million mentioned above, $1,297 million represents U.S. Treasury securities.

The following table shows the fair value of AFS securities that have been in an unrealized loss position:

In millions of dollars	Less than 12 months		12 months or longer		Total	
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses
December 31, 2018						
Debt securities AFS[1]						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$4,022	$ 286	$13,143	$ 439	$17,165	$ 725
Non-U.S. residential	284	2	2	—	286	2
Commercial	79	1	82	1	161	2
Total mortgage-backed securities	$4,385	$ 289	$13,227	$ 440	$17,612	$ 729
U.S. Treasury and federal agency securities						
U.S. Treasury	$8,389	$ 42	$77,883	$ 1,297	$86,272	$ 1,339
Agency obligations	277	2	8,660	130	8,937	132
Total U.S. Treasury and federal agency securities	$8,666	$ 44	$86,543	$ 1,427	$95,209	$ 1,471
State and municipal	$1,614	$ 34	$1,303	$ 228	$2,917	$ 262
Foreign government	40,655	265	15,053	331	55,708	596
Corporate	4,547	115	2,077	42	6,624	157
Asset-backed securities	441	4	55	—	496	4
Other debt securities	1,790	1	—	—	1,790	1
Total debt securities AFS	$62,098	$ 752	$118,258	$ 2,468	$180,356	$ 3,220
December 31, 2017						
Securities AFS						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$30,994	$ 438	$2,206	$ 62	$33,200	$ 500
Non-U.S. residential	753	6	—	—	753	6
Commercial	150	1	57	1	207	2
Total mortgage-backed securities	$31,897	$ 445	$2,263	$ 63	$34,160	$ 508
U.S. Treasury and federal agency securities						
U.S. Treasury	$79,050	$ 856	$7,404	$ 115	$86,454	$ 971
Agency obligations	8,857	110	1,163	14	10,020	124
Total U.S. Treasury and federal agency securities	$87,907	$ 966	$8,567	$ 129	$96,474	$ 1,095
State and municipal	$1,009	$ 11	$1,155	$ 234	$2,164	$ 245
Foreign government	53,206	356	9,051	234	62,257	590
Corporate	6,737	74	859	12	7,596	86
Asset-backed securities	449	1	25	1	474	2
Other debt securities	—	—	—	—	—	—
Marketable equity securities AFS[1]	11	1	—	—	11	1
Total securities AFS	$181,216	$ 1,854	$21,920	$ 673	$203,136	$ 2,527

(1) Citi adopted ASU 2016-01 and ASU 2018-03 as of January 1, 2018, resulting in a cumulative effect adjustment from AOCI to Retained earnings for net unrealized gains on marketable equity securities AFS. The AFS category was eliminated for equity securities effective January 1, 2018. See Note 1 to the Consolidated Financial Statements for additional details.

The following table presents the amortized cost and fair value of AFS debt securities by contractual maturity dates:

In millions of dollars	December 31, 2018 Amortized cost	2018 Fair value	2017 Amortized cost	2017 Fair value
Mortgage-backed securities[1]				
Due within 1 year	$14	$14	$45	$45
After 1 but within 5 years	662	661	1,306	1,304
After 5 but within 10 years	2,779	2,828	1,376	1,369
After 10 years[2]	41,533	41,002	42,504	42,239
Total	$44,988	$44,505	$45,231	$44,957
U.S. Treasury and federal agency securities				
Due within 1 year	$41,941	$41,867	$4,913	$4,907
After 1 but within 5 years	76,139	74,800	111,236	110,238
After 5 but within 10 years	489	462	3,008	3,001
After 10 years[2]	90	93	—	—
Total	$118,659	$117,222	$119,157	$118,146
State and municipal				
Due within 1 year	$2,586	$2,586	$1,792	$1,792
After 1 but within 5 years	1,676	1,675	2,579	2,576
After 5 but within 10 years	585	602	514	528
After 10 years[2]	4,525	4,343	3,985	3,869
Total	$9,372	$9,206	$8,870	$8,765
Foreign government				
Due within 1 year	$39,078	$39,028	$32,130	$32,100
After 1 but within 5 years	50,125	49,962	53,034	53,165
After 5 but within 10 years	10,153	10,149	12,949	12,680
After 10 years[2]	1,516	1,552	2,502	2,588
Total	$100,872	$100,691	$100,615	$100,533
All other[3]				
Due within 1 year	$6,166	$6,166	$3,998	$3,991
After 1 but within 5 years	8,459	8,416	9,047	9,027
After 5 but within 10 years	1,474	1,427	3,415	3,431
After 10 years[2]	433	405	1,887	1,875
Total	$16,532	$16,414	$18,347	$18,324
Total debt securities AFS	$290,423	$288,038	$292,220	$290,725

(1) Includes mortgage-backed securities of U.S. government-sponsored agencies.

(2) Investments with no stated maturities are included as contractual maturities of greater than 10 years. Actual maturities may differ due to call or prepayment rights.

(3) Includes corporate, asset-backed and other debt securities.

Debt Securities Held-to-Maturity

The carrying value and fair value of debt securities HTM were as follows:

In millions of dollars	Carrying value	Gross unrealized gains	Gross unrealized losses	Fair value
December 31, 2018				
Debt securities HTM				
Mortgage-backed securities[1][2]				
U.S. government agency guaranteed	$34,239	$ 199	$ 578	$33,860
Alt-A	—	—	—	—
Non-U.S. residential	1,339	12	1	1,350
Commercial	368	—	—	368
Total mortgage-backed securities	$35,946	$ 211	$ 579	$35,578
State and municipal	$7,628	$ 167	$ 138	$7,657
Foreign government	1,027	—	24	1,003
Asset-backed securities[1]	18,756	8	112	18,652
Total debt securities HTM	$63,357	$ 386	$ 853	$62,890
December 31, 2017				
Debt securities HTM				
Mortgage-backed securities[1]				
U.S. government agency guaranteed	$23,880	$ 40	$ 157	$23,763
Alt-A	141	57	—	198
Non-U.S. residential	1,841	65	—	1,906
Commercial	237	—	—	237
Total mortgage-backed securities	$26,099	$ 162	$ 157	$26,104
State and municipal[3]	$8,897	$ 378	$ 73	$9,202
Foreign government	740	—	18	722
Asset-backed securities[1]	17,584	162	22	17,724
Total debt securities HTM	$53,320	$ 702	$ 270	$53,752

(1) The Company invests in mortgage- and asset-backed securities. These securitization entities are generally considered VIEs. The Company's maximum exposure to loss from these VIEs is equal to the carrying amount of the securities, which is reflected in the table above. For mortgage- and asset-backed securitizations in which the Company has other involvement, see Note 21 to the Consolidated Financial Statements.

(2) In November 2018, Citibank transferred $10 billion of agency residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (CMBS) from AFS classification to HTM classification in accordance with ASC 320. At the time of transfer, the securities were in an unrealized loss position of $598 million. This amount will remain in AOCI and be amortized over the remaining life of the securities.

(3) In the second quarter of 2017, Citi early adopted ASU 2017-08. Upon adoption, a cumulative effect adjustment was recorded to reduce Retained earnings, effective January 1, 2017, for the incremental amortization of purchase premiums and cumulative fair value hedge adjustments that would have been recorded under the ASU on callable state and municipal debt securities. See Note 1 to the Consolidated Financial Statements.

The Company has the positive intent and ability to hold these securities to maturity or, where applicable, to exercise any issuer call options, absent any unforeseen significant changes in circumstances, including deterioration in credit or changes in regulatory capital requirements.

The net unrealized losses classified in AOCI for HTM securities primarily relate to debt securities previously classified as AFS that were transferred to HTM, and include any cumulative fair value hedge adjustments. The net unrealized loss amount also includes any non-credit-related changes in fair value of HTM debt securities that have suffered credit impairment recorded in earnings. The AOCI balance related to HTM debt securities is amortized as an adjustment of yield, in a manner consistent with the accretion of any difference between the carrying value at the transfer date and par value of the same debt securities.

The table below shows the fair value of debt securities HTM that have been in an unrecognized loss position:

	Less than 12 months		12 months or longer		Total	
In millions of dollars	Fair value	Gross unrecognized losses	Fair value	Gross unrecognized losses	Fair value	Gross unrecognized losses
December 31, 2018						
Debt securities HTM						
Mortgage-backed securities	$2,822	$ 20	$18,086	$ 559	$20,908	$ 579
State and municipal	981	34	1,242	104	2,223	138
Foreign government	1,003	24	—	—	1,003	24
Asset-backed securities	13,008	112	—	—	13,008	112
Total debt securities HTM	$17,814	$ 190	$19,328	$ 663	$37,142	$ 853
December 31, 2017						
Debt securities HTM						
Mortgage-backed securities	$8,569	$ 50	$6,353	$ 107	$14,922	$ 157
State and municipal	353	5	835	68	1,188	73
Foreign government	723	18	—	—	723	18
Asset-backed securities	71	3	134	19	205	22
Total debt securities HTM	$9,716	$ 76	$7,322	$ 194	$17,038	$ 270

Note: Excluded from the gross unrecognized losses presented in the above table are $(653) million and $(117) million of net unrealized losses recorded in AOCI as of December 31, 2018 and 2017, respectively, primarily related to the difference between the amortized cost and carrying value of HTM debt securities that were reclassified from AFS. Substantially all of these net unrecognized losses relate to securities that have been in a loss position for 12 months or longer at December 31, 2018 and 2017.

The following table presents the carrying value and fair value of HTM debt securities by contractual maturity dates:

In millions of dollars	December 31, 2018 Carrying value	Fair value	2017 Carrying value	Fair value
Mortgage-backed securities				
Due within 1 year	$3	$3	$—	$—
After 1 but within 5 years	539	540	720	720
After 5 but within 10 years	997	1,011	148	149
After 10 years[1]	34,407	34,024	25,231	25,235
Total	$35,946	$35,578	$26,099	$26,104
State and municipal				
Due within 1 year	$37	$37	$407	$425
After 1 but within 5 years	168	174	259	270
After 5 but within 10 years	540	544	512	524
After 10 years[1]	6,883	6,902	7,719	7,983
Total	$7,628	$7,657	$8,897	$9,202
Foreign government				
Due within 1 year	$60	$36	$381	$381
After 1 but within 5 years	967	967	359	341
After 5 but within 10 years	—	—	—	—
After 10 years[1]	—	—	—	—
Total	$1,027	$1,003	$740	$722
All other[2]				
Due within 1 year	$—	$—	$—	$—
After 1 but within 5 years	—	—	—	—
After 5 but within 10 years	2,535	2,539	1,669	1,680
After 10 years[1]	16,221	16,113	15,915	16,044
Total	$18,756	$18,652	$17,584	$17,724
Total debt securities HTM	$63,357	$62,890	$53,320	$53,752

(1) Investments with no stated maturities are included as contractual maturities of greater than 10 years. Actual maturities may differ due to call or prepayment rights.

(2) Includes corporate and asset-backed securities.

Evaluating Investments for Other-Than-Temporary Impairment

Overview

The Company conducts periodic reviews of all securities with unrealized losses to evaluate whether the impairment is other-than-temporary. These reviews apply to all securities that are not measured at fair value through earnings. Effective January 1, 2018, the AFS category was eliminated for equity securities and, therefore, other-than-temporary impairment (OTTI) review is not required for those securities. See Note 1 to the Consolidated Financial Statements for additional details.

An unrealized loss exists when the current fair value of an individual security is less than its amortized cost basis. Unrealized losses that are determined to be temporary in nature are recorded, net of tax, in AOCI for AFS securities. Temporary losses related to HTM debt securities generally are not recorded, as these investments are carried at adjusted amortized cost basis. However, for HTM debt securities with credit-related impairment, the credit loss is recognized in earnings as OTTI, and any difference between the cost basis adjusted for the OTTI and fair value is recognized in AOCI and amortized as an adjustment of yield over the remaining contractual life of the security. For debt securities transferred to HTM from Trading account assets, amortized cost is defined as the fair value of the securities at the date of transfer, plus any accretion income and less any impairment recognized in earnings subsequent to transfer. For debt securities transferred to HTM from AFS, amortized cost is defined as the original purchase cost, adjusted for the cumulative accretion or amortization of any purchase discount or premium, plus or minus any cumulative fair value hedge adjustments, net of accretion or amortization, and less any impairment recognized in earnings.

Regardless of the classification of securities as AFS or HTM, the Company assesses each position with an unrealized loss for OTTI. Factors considered in determining whether a loss is temporary include:

- the length of time and the extent to which fair value has been below cost;
- the severity of the impairment;
- the cause of the impairment and the financial condition and near-term prospects of the issuer;
- activity in the market of the issuer that may indicate adverse credit conditions; and
- the Company’s ability and intent to hold the investment for a period of time sufficient to allow for any anticipated recovery.

The Company’s review for impairment generally entails:

- identification and evaluation of impaired investments;
- analysis of individual investments that have fair values less than amortized cost, including consideration of the length of time the investment has been in an unrealized loss position and the expected recovery period;
- consideration of evidential matter, including an evaluation of factors or triggers that could cause individual investments to qualify as having other-than-

temporary impairment and those that would not support other-than-temporary impairment; and
- documentation of the results of these analyses, as required under business policies.

Debt Securities

The difference between amortized cost basis and fair value is recognized in earnings as OTTI for impaired debt securities that the Company has an intent to sell, or for which the Company believes it will more-likely-than-not be required to sell prior to recovery of the amortized cost basis. However, for those securities that the Company does not intend to sell and is not likely to be required to sell, only the credit-related impairment is recognized in earnings and any non-credit-related impairment is recorded in AOCI.

For debt securities, credit impairment exists where management does not expect to receive contractual principal and interest cash flows sufficient to recover the entire amortized cost basis of a security.

AFS Equity Securities and Equity Method Investments

For AFS equity securities, prior to January 1, 2018, management considered the various factors described above, including its intent and ability to hold an equity security for a period of time sufficient for recovery to cost, or whether it was more-likely-than-not that the Company would have been required to sell the security prior to recovery of its cost basis. Where management lacked that intent or ability, the security's decline in fair value was deemed to be other-than-temporary and was recorded in earnings. Effective January 1, 2018, the AFS category has been eliminated for equity securities and, therefore, OTTI review is not required for those securities. See Note 1 to the Consolidated Financial Statements for additional details.

Management also assesses equity method investments that have fair values that are less than their respective carrying values for OTTI. Fair value is measured as price multiplied by quantity if the investee has publicly listed securities. If the investee is not publicly listed, other methods are used (see Note 24 to the Consolidated Financial Statements).

For impaired equity method investments that Citi plans to sell prior to recovery of value or would likely be required to sell, with no expectation that the fair value will recover prior to the expected sale date, the full impairment is recognized in earnings as OTTI regardless of severity and duration. The measurement of the OTTI does not include partial projected recoveries subsequent to the balance sheet date.

For impaired equity method investments that management does not plan to sell and is not likely to be required to sell prior to recovery of value, the evaluation of whether an impairment is other-than-temporary is based on (i) whether and when an equity method investment will recover in value and (ii) whether the investor has the intent and ability to hold that investment for a period of time sufficient to recover the value. The determination of whether the impairment is considered other-than-temporary considers the following indicators:

- the cause of the impairment and the financial condition and near-term prospects of the issuer, including any specific events that may influence the operations of the issuer;
- the intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value; and
- the length of time and extent to which fair value has been less than the carrying value.

The sections below describe the Company's process for identifying credit-related impairments for security types that have the most significant unrealized losses as of December 31, 2018.

Mortgage-Backed Securities

For U.S. mortgage-backed securities, credit impairment is assessed using a cash flow model that estimates the principal and interest cash flows on the underlying mortgages using the security-specific collateral and transaction structure. The model distributes the estimated cash flows to the various tranches of securities, considering the transaction structure and any subordination and credit enhancements that exist in that structure. The cash flow model incorporates actual cash flows on the mortgage-backed securities through the current period and then estimates the remaining cash flows using a number of assumptions, including default rates, prepayment rates, recovery rates (on foreclosed properties) and loss severity rates (on non-agency mortgage-backed securities).

Management develops specific assumptions using market data, internal estimates and estimates published by rating agencies and other third-party sources. Default rates are projected by considering current underlying mortgage loan performance, generally assuming the default of (i) 10% of

current loans, (ii) 25% of 30–59 day delinquent loans, (iii) 70% of 60–90 day delinquent loans and (iv) 100% of 91+ day delinquent loans. These estimates are extrapolated along a default timing curve to estimate the total lifetime pool default rate. Other assumptions contemplate the actual collateral attributes, including geographic concentrations, rating actions and current market prices.

Cash flow projections are developed using different stress test scenarios. Management evaluates the results of those stress tests (including the severity of any cash shortfall indicated and the likelihood of the stress scenarios actually occurring based on the underlying pool's characteristics and performance) to assess whether management expects to recover the amortized cost basis of the security. If cash flow projections indicate that the Company does not expect to recover its amortized cost basis, the Company recognizes the estimated credit loss in earnings.

State and Municipal Securities

The process for identifying credit impairments in Citigroup's AFS and HTM state and municipal bonds is primarily based on a credit analysis that incorporates third-party credit ratings. Citigroup monitors the bond issuers and any insurers providing default protection in the form of financial guarantee insurance. The average external credit rating, ignoring any insurance, is Aa3/AA-. In the event of an external rating downgrade or other indicator of credit impairment (i.e., based on instrument-specific estimates of cash flows or probability of issuer default), the subject bond is specifically reviewed for adverse changes in the amount or timing of expected contractual principal and interest payments.

For state and municipal bonds with unrealized losses that Citigroup plans to sell, or would be more-likely-than-not required to sell, the full impairment is recognized in earnings.

Recognition and Measurement of OTTI

The following tables present total OTTI recognized in earnings:

OTTI on Investments and Other Assets	Year ended December 31, 2018			
In millions of dollars	AFS[1]	HTM	Other assets	Total
Impairment losses related to debt securities that the Company does not intend to sell nor will likely be required to sell:				

Total OTTI losses recognized during the period	$—	$	~~$~~	~~$~~—
Less: portion of impairment loss recognized in AOCI (before taxes)	—	—	—	—
Net impairment losses recognized in earnings for debt securities that the Company does not intend to sell nor will likely be required to sell	$—	$	~~$~~	~~$~~—
Impairment losses recognized in earnings for debt securities that the Company intends to sell, would be more-likely-than-not required to sell or will be subject to an issuer call deemed probable of exercise	125	—	—	125
Total OTTI losses recognized in earnings	$125	$	~~$~~	~~$~~125

(1) For the year ended December 31, 2018, amounts represent AFS debt securities. Effective January 1, 2018, the AFS category was eliminated for equity securities. See Note 1 to the Consolidated Financial Statements for additional details.

OTTI on Investments and Other Assets	Year ended December 31, 2017			
In millions of dollars	AFS[1]	HTM	Other assets	Total
Impairment losses related to securities that the Company does not intend to sell nor will likely be required to sell:				
Total OTTI losses recognized during the period	$2	$ —	$ —	$2
Less: portion of impairment loss recognized in AOCI (before taxes)	—	—	—	—
Net impairment losses recognized in earnings for securities that the Company does not intend to sell nor will likely be required to sell	$2	$ —	$ —	$2
Impairment losses recognized in earnings for securities that the Company intends to sell, would be more-likely-than-not required to sell or will be subject to an issuer call deemed probable of exercise	59	2	—	61
Total OTTI losses recognized in earnings	$61	$ 2	$ —	$63

(1) Includes OTTI on non-marketable equity securities.

OTTI on Investments and Other Assets	Year ended December 31, 2016			
In millions of dollars	AFS[1][2]	HTM	Other assets[3]	Total
Impairment losses related to securities that the Company does not intend to sell nor will likely be required to sell:				
Total OTTI losses recognized during the period	$3	$ 1	$ —	$4
Less: portion of impairment loss recognized in AOCI (before taxes)	—	—	—	—
Net impairment losses recognized in earnings for securities that the Company does not intend to sell nor will likely be required to sell	$3	$ 1	$ —	$4
Impairment losses recognized in earnings for securities that the Company intends to sell or more-likely-than-not will be required to sell before recovery	246	38	332	616
Total OTTI losses recognized in earnings	$249	$ 39	$ 332	$620

(1) Includes OTTI on non-marketable equity securities.
(2) Includes a $160 million impairment related to AFS securities affected by changes in the Venezuela exchange rate during 2016.
(3) The impairment charge is related to the carrying value of an equity investment sold in 2016.

The following are 12-month rollforwards of the credit-related impairments recognized in earnings for AFS and HTM debt securities held that the Company does not intend to sell nor likely will be required to sell:

In millions of dollars	Cumulative OTTI credit losses recognized in earnings on debt securities still held				
	Dec. 31, 2017 balance	Credit impairments recognized in earnings on securities not previously impaired	Credit impairments recognized in earnings on securities that have been previously impaired	Reductions due to credit-impaired securities sold, transferred or matured[1]	Dec. 31, 2018 balance
AFS debt securities					
Mortgage-backed securities[2]	$38	$—	$—	$(37)	$1
State and municipal	4	—	—	(4)	—
Foreign government securities	—	—	—	—	—
Corporate	4	—	—	—	4
All other debt securities	2	—	—	(2)	—
Total OTTI credit losses recognized for AFS debt securities	$48	$—	$—	$(43)	$5
HTM debt securities					
Mortgage-backed securities[3]	$54	$—	$—	$(54)	$—
State and municipal	3	—	—	(3)	—
Total OTTI credit losses recognized for HTM debt securities	$57	$—	$—	$(57)	$—

(1) Includes $18 million in cumulative OTTI reclassified from HTM to AFS due to the transfer of the related debt securities from HTM to AFS. Citi adopted ASU 2017-12, Targeted Improvements to Accounting for Hedging Activities, on January 1, 2018 and transferred approximately $4 billion of HTM debt securities into AFS classification as permitted as a one-time transfer under the standard.

(2) Primarily consists of Prime securities.

(3) Primarily consists of Alt-A securities.

In millions of dollars	Cumulative OTTI credit losses recognized in earnings on debt securities still held				
	Dec. 31, 2016 balance	Credit impairments recognized in earnings on securities not previously impaired	Credit impairments recognized in earnings on securities that have been previously impaired	Reductions due to credit-impaired securities sold, transferred or matured[1]	Dec. 31, 2017 balance
AFS debt securities					
Mortgage-backed securities [1][2]	$—	$—	$—	$38	$38
State and municipal	4	—	—	—	4
Foreign government securities	—	—	—	—	—
Corporate	5	—	—	(1)	4
All other debt securities	22	—	2	(22)	2
	$31	$—	$2	$15	$48

Total OTTI credit losses recognized for AFS debt securities					
HTM debt securities					
Mortgage-backed securities[1] [3]	$101	$ —	$ —	$ (47)	$ 54
State and municipal	3	—	—	—	3
Total OTTI credit losses recognized for HTM debt securities	$104	$ —	$ —	$ (47)	$ 57

(1) Includes $38 million in cumulative OTTI reclassified from HTM to AFS due to the transfer of the related securities from HTM to AFS.
(2) Primarily consists of Prime securities.
(3) Primarily consists of Alt-A securities.

Non-Marketable Equity Securities Not Carried at Fair Value

Effective January 1, 2018, non-marketable equity securities are required to be measured at fair value with changes in fair value recognized in earnings unless (i) the measurement alternative is elected or (ii) the investment represents Federal Reserve Bank and Federal Home Loan Bank stock or certain exchange seats that continue to be carried at cost. See Note 1 to the Consolidated Financial Statements for additional details.

The election to measure a non-marketable equity security using the measurement alternative is made on an instrument-by-instrument basis. Under the measurement alternative, an equity security is carried at cost plus or minus changes resulting from observable prices in orderly transactions for the identical or a similar investment of the same issuer. The carrying value of the equity security is adjusted to fair value on the date of an observed transaction. Fair value may differ from the observed transaction price due to a number of factors, including marketability adjustments and differences in rights and obligations when the observed transaction is not for the identical investment held by Citi.

Equity securities under the measurement alternative are also assessed for impairment. On a quarterly basis, management qualitatively assesses whether each equity security under the measurement alternative is impaired. Impairment indicators that are considered include, but are not limited to, the following:

- a significant deterioration in the earnings performance, credit rating, asset quality or business prospects of the investee;
- a significant adverse change in the regulatory, economic or technological environment of the investee;
- a significant adverse change in the general market condition of either the geographical area or the industry in which the investee operates;
- a bona fide offer to purchase, an offer by the investee to sell or a completed auction process for the same or similar investment for an amount less than the carrying amount of that investment; and
- factors that raise significant concerns about the investee's ability to continue as a going concern, such as negative cash flows from operations, working capital deficiencies or noncompliance with statutory capital requirements or debt covenants.

When the qualitative assessment indicates that impairment exists, the investment is written down to fair value, with the full difference between the fair value of the investment and its carrying amount recognized in earnings.

Below is the carrying value of non-marketable equity securities measured using the measurement alternative at December 31, 2018, and amounts recognized in earnings for the year ended December 31, 2018:

In millions of dollars	Year Ended December 31, 2018
Measurement alternative:	
Balance as of December 31, 2018	$ 538
Impairment losses[1]	7
Downward changes for observable prices[1]	18
Upward changes for observable prices[1]	219

(1) See Note 24 to the Consolidated Financial Statements for additional information on these nonrecurring fair value measurements.

A similar impairment analysis is performed for non-marketable equity securities carried at cost. For the year ended December 31, 2018, there was no impairment loss recognized in earnings for non-marketable equity securities carried at cost.

Investments in Alternative Investment Funds That Calculate Net Asset Value

The Company holds investments in certain alternative investment funds that calculate net asset value (NAV), or its equivalent, including hedge funds, private equity funds, funds of funds and real estate funds, as provided by third-party asset managers. Investments in such funds are generally classified as non-marketable equity securities carried at fair value. The fair values of these investments are estimated using the NAV of the Company's ownership interest in the funds. Some of these investments are in "covered funds" for purposes of the

Volcker Rule, which prohibits certain proprietary investment activities and limits the ownership of, and relationships with, covered funds. On April 21, 2017, Citi's request for extension of the permitted holding period under the Volcker Rule for certain of its investments in illiquid funds was approved, allowing the Company to hold such investments until the earlier of five years from the July 21, 2017 expiration date of the general conformance period, or the date such investments mature or are otherwise conformed with the Volcker Rule.

	Fair value		Unfunded commitments		Redemption frequency (if currently eligible) monthly, quarterly, annually	Redemption notice period
In millions of dollars	December 31, 2018	December 31, 2017	December 31, 2018	December 31, 2017		
Hedge funds	$ —	$ 1	$ —	$ —	Generally quarterly	10–95 days
Private equity funds[1]	168	372	62	62	—	—
Real estate funds[2]	14	31	19	20	—	—
Mutual/collective investment funds	25	—	—	—		
Total	$ 207	$ 404	$ 81	$ 82	—	—

(1) Private equity funds include funds that invest in infrastructure, emerging markets and venture capital.

(2) Includes several real estate funds that invest primarily in commercial real estate in the U.S., Europe and Asia.

14. LOANS

Citigroup loans are reported in two categories: consumer and corporate. These categories are classified primarily according to the segment and subsegment that manage the loans.

Consumer Loans

Consumer loans represent loans and leases managed primarily by GCB and Corporate/Other. The following table provides Citi's consumer loans by loan type:

	December 31,	
In millions of dollars	2018	2017
In U.S. offices		
Mortgage and real estate[1]	$60,127	$65,467
Installment, revolving credit and other	3,398	3,398
Cards	143,788	139,006
Commercial and industrial	8,256	7,840
Total	$215,569	$215,711
In offices outside the U.S.		
Mortgage and real estate[1]	$43,379	$44,081
Installment, revolving credit and other	27,609	26,556
Cards	25,400	26,257
Commercial and industrial	17,773	20,238
Lease financing	49	76
Total	$114,210	$117,208
Total consumer loans	$329,779	$332,919
Net unearned income	$708	$737
Consumer loans, net of unearned income	$330,487	$333,656

(1) Loans secured primarily by real estate.

Citigroup has established a risk management process to monitor, evaluate and manage the principal risks associated with its consumer loan portfolio. Credit quality indicators that are actively monitored include delinquency status, consumer credit scores (FICO) and loan to value (LTV) ratios, each as discussed in more detail below.

Included in the loan table above are lending products whose terms may give rise to greater credit issues. Credit cards with below-market introductory interest rates and interest-only loans are examples of such products. These products are closely managed using credit techniques that are intended to mitigate their higher inherent risk.

During the years ended December 31, 2018 and 2017, the Company sold and/or reclassified to HFS $3.2 billion and $4.9 billion, respectively, of consumer loans.

Delinquency Status

Delinquency status is monitored and considered a key indicator of credit quality of consumer loans. Principally, the U.S. residential first mortgage loans use the Mortgage Bankers Association (MBA) method of reporting delinquencies, which considers a loan delinquent if a monthly payment has not been received by the end of the day immediately preceding the loan's next due date. All other loans use a method of reporting delinquencies that considers a loan delinquent if a monthly payment has not been received by the close of business on the loan's next due date.

As a general policy, residential first mortgages, home equity loans and installment loans are classified as non-accrual when loan payments are 90 days contractually past due. Credit cards and unsecured revolving loans generally accrue interest until payments are 180 days past due. Home equity loans in regulated bank entities are classified as non-accrual if the related residential first mortgage is 90 days or more past due. Mortgage loans, other than Federal Housing Administration (FHA)-insured loans, are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy. Commercial banking loans are placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due.

The policy for re-aging modified U.S. consumer loans to current status varies by product. Generally, one of the conditions to qualify for these modifications is that a minimum number of payments (typically ranging from one to three) be made. Upon modification, the loan is re-aged to current status. However, re-aging practices for certain open-ended consumer loans, such as credit cards, are governed by Federal Financial Institutions Examination Council (FFIEC) guidelines. For open-ended consumer loans subject to FFIEC guidelines, one of the conditions for a loan to be re-aged to current status is that at least three consecutive minimum monthly payments, or the equivalent amount, must be received. In addition, under FFIEC guidelines, the number of times that such a loan can be re-aged is subject to limitations (generally once in 12 months and twice in five years). Furthermore, FHA and Department of Veterans Affairs (VA) loans are modified under those respective agencies' guidelines and payments are not always required in order to re-age a modified loan to current.

Consumer Loan Delinquency and Non-Accrual Details at December 31, 2018

In millions of dollars	Total current[1][2]	30–89 days past due[3]	≥ 90 days past due[3]	Past due government guaranteed[4]	Total loans[2]	Total non-accrual	90 days past due and accruing
In North America offices							
Residential first mortgages[5]	$ 45,953	$ 420	$ 253	$ 786	$47,412	$ 583	$ 549
Home equity loans[6][7]	11,135	161	247	—	11,543	527	—
Credit cards	141,106	1,687	1,764	—	144,557	—	1,764
Installment and other	3,394	43	16	—	3,453	22	—
Commercial banking loans	9,662	20	46	—	9,728	109	—
Total	$ 211,250	$ 2,331	$ 2,326	$ 786	$216,693	$ 1,241	$ 2,313
In offices outside North America							
Residential first mortgages[5]	$ 35,624	$ 203	$ 145	$ —	$35,972	$ 383	$ —
Credit cards	24,131	425	370	—	24,926	312	235
Installment and other	25,085	254	107	—	25,446	152	—
Commercial banking loans	27,345	51	53	—	27,449	138	—
Total	$ 112,185	$ 933	$ 675	$ —	$113,793	$ 985	$ 235
Total GCB and Corporate/Other—Consumer	$ 323,435	$ 3,264	$ 3,001	$ 786	$330,486	$ 2,226	$ 2,548
Other[8]	1	—	—	—	1	—	—
Total Citigroup	$ 323,436	$ 3,264	$ 3,001	$ 786	$330,487	$ 2,226	$ 2,548

(1) Loans less than 30 days past due are presented as current.

(2) Includes $20 million of residential first mortgages recorded at fair value.

(3) Excludes loans guaranteed by U.S. government-sponsored entities.

(4) Consists of residential first mortgages that are guaranteed by U.S. government-sponsored entities that are 30–89 days past due of $0.2 billion and 90 days or more past due of $0.6 billion.

(5) Includes approximately $0.1 billion of residential first mortgage loans in process of foreclosure.

(6) Includes approximately $0.1 billion of home equity loans in process of foreclosure.

(7) Fixed-rate home equity loans and loans extended under home equity lines of credit, which are typically in junior lien positions.

(8) Represents loans classified as consumer loans on the Consolidated Balance Sheet that are not included in Corporate/Other consumer credit metrics.

Consumer Loan Delinquency and Non-Accrual Details at December 31, 2017

In millions of dollars	Total current[1][2]	30–89 days past due[3]	≥ 90 days past due[3]	Past due government guaranteed[4]	Total loans[2]	Total non-accrual	90 days past due and accruing
In North America offices							
Residential first mortgages[5]	$ 47,366	$ 505	$ 280	$ 1,225	$49,376	$ 665	$ 941
Home equity loans[6][7]	14,268	207	352	—	14,827	750	—
Credit cards	136,588	1,528	1,613	—	139,729	—	1,596
Installment and other	3,395	45	16	—	3,456	22	1
Commercial banking loans	9,395	51	65	—	9,511	213	—
Total	$ 211,012	$ 2,336	$ 2,326	$ 1,225	$216,899	$ 1,650	$ 2,538
In offices outside North America							
Residential first mortgages[5]	$ 37,062	$ 209	$ 148	$ —	$37,419	$ 400	$ —
Credit cards	24,934	427	366	—	25,727	323	259
Installment and other	25,634	275	123	—	26,032	157	—
Commercial banking loans	27,449	57	72	—	27,578	160	—
Total	$ 115,079	$ 968	$ 709	$ —	$116,756	$ 1,040	$ 259
Total GCB and Corporate/Other—Consumer	$ 326,091	$ 3,304	$ 3,035	$ 1,225	$333,655	$ 2,690	$ 2,797
Other[8]	1	—	—	—	1	—	—
Total Citigroup	$ 326,092	$ 3,304	$ 3,035	$ 1,225	$333,656	$ 2,690	$ 2,797

(1) Loans less than 30 days past due are presented as current.
(2) Includes $25 million of residential first mortgages recorded at fair value.
(3) Excludes loans guaranteed by U.S. government-sponsored entities.
(4) Consists of residential first mortgages that are guaranteed by U.S. government-sponsored entities that are 30–89 days past due of $0.2 billion and 90 days or more past due of $1.0 billion.
(5) Includes approximately $0.1 billion of residential first mortgage loans in process of foreclosure.
(6) Includes approximately $0.1 billion of home equity loans in process of foreclosure.
(7) Fixed-rate home equity loans and loans extended under home equity lines of credit, which are typically in junior lien positions.
(8) Represents loans classified as consumer loans on the Consolidated Balance Sheet that are not included in the Corporate/Other consumer credit metrics.

Consumer Credit Scores (FICO)

In the U.S., independent credit agencies rate an individual's risk for assuming debt based on the individual's credit history and assign every consumer a "FICO" (Fair Isaac Corporation) credit score. These scores are continually updated by the agencies based upon an individual's credit actions (e.g., taking out a loan or missed or late payments).

The following tables provide details on the FICO scores for Citi's U.S. consumer loan portfolio based on end-of-period receivables (commercial banking loans are excluded from the tables since the customers are businesses and FICO scores are not a primary driver in their credit evaluation). FICO scores are updated monthly for substantially all of the portfolio or, otherwise, on a quarterly basis for the remaining portfolio.

FICO score distribution in U.S. portfolio[1][2]	December 31, 2018		
In millions of dollars	Less than 680	680 to 760	Greater than 760
Residential first mortgages	$4,530	$13,848	$26,546
Home equity loans	2,438	4,296	4,471
Credit cards	32,686	58,722	51,299

Installment and other	625	1,097	1,121
Total	$40,279	$77,963	$83,437

FICO score distribution in U.S. portfolio[1][2]	December 31, 2017		
In millions of dollars	Less than 680	680 to 760	Greater than 760
Residential first mortgages	$5,603	$14,423	$26,271
Home equity loans	3,347	5,439	5,650
Credit cards	30,875	56,443	48,989
Installment and other	716	1,020	1,275
Total	$40,541	$77,325	$82,185

(1) Excludes loans guaranteed by U.S. government entities, loans subject to long-term standby commitments (LTSC) with U.S. government-sponsored entities and loans recorded at fair value.

(2) Excludes balances where FICO was not available. Such amounts are not material.

Loan to Value (LTV) Ratios

LTV ratios (loan balance divided by appraised value) are calculated at origination and updated by applying market price data.

The following tables provide details on the LTV ratios for Citi's U.S. consumer mortgage portfolios. LTV ratios are updated monthly using the most recent Core Logic Home Price Index data available for substantially all of the portfolio applied at the Metropolitan Statistical Area level, if available, or the state level if not. The remainder of the portfolio is updated in a similar manner using the Federal Housing Finance Agency indices.

LTV distribution in U.S. portfolio[1][2]	December 31, 2018		
In millions of dollars	Less than or equal to 80%	> 80% but less than or equal to 100%	Greater than 100%
Residential first mortgages	$42,379	$2,474	$ 197
Home equity loans	9,465	1,287	390
Total	$51,844	$3,761	$ 587

LTV distribution in U.S. portfolio[1][2]	December 31, 2017		
In millions of dollars	Less than or equal to 80%	> 80% but less than or equal to 100%	Greater than 100%
Residential first mortgages	$43,626	$2,578	$ 247
Home equity loans	11,403	2,147	800
Total	$55,029	$4,725	$1,047

(1) Excludes loans guaranteed by U.S. government entities, loans subject to LTSCs with U.S. government-sponsored entities and loans recorded at fair value.

(2) Excludes balances where LTV was not available. Such amounts are not material.

Impaired Consumer Loans

A loan is considered impaired when Citi believes it is probable that all amounts due according to the original contractual terms of the loan will not be collected. Impaired consumer loans include non-accrual commercial banking loans, as well as smaller-balance homogeneous loans whose terms have been modified due to the borrower's financial difficulties and where Citi has granted a concession to the borrower. These

modifications may include interest rate reductions and/or principal forgiveness. Impaired consumer loans exclude smaller-balance homogeneous loans that have not been modified and are carried on a non-accrual basis.

The following tables present information about impaired consumer loans and interest income recognized on impaired consumer loans:

	At and for the year ended December 31, 2018				
In millions of dollars	Recorded investment[1][2]	Unpaid principal balance	Related specific allowance[3]	Average carrying value[4]	Interest income recognized[5]
Mortgage and real estate					
Residential first mortgages	$2,130	$ 2,329	$ 178	$ 2,483	$ 81
Home equity loans	684	946	122	698	12
Credit cards	1,818	1,842	677	1,815	105
Installment and other					
Individual installment and other	400	434	146	414	22
Commercial banking	252	432	55	286	14
Total	$5,284	$ 5,983	$ 1,178	$ 5,696	$ 234

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount and direct write-downs and includes accrued interest only on credit card loans.

(2) $484 million of residential first mortgages, $263 million of home equity loans and $2 million of commercial banking loans do not have a specific allowance.

(3) Included in the Allowance for loan losses.

(4) Average carrying value represents the average recorded investment ending balance for the last four quarters and does not include the related specific allowance.

(5) Includes amounts recognized on both an accrual and cash basis.

	At and for the year ended December 31, 2017				
In millions of dollars	Recorded investment[1][2]	Unpaid principal balance	Related specific allowance[3]	Average carrying value[4]	Interest income recognized[5][6]
Mortgage and real estate					
Residential first mortgages	$2,877	$ 3,121	$ 278	$ 3,155	$ 119
Home equity loans	1,151	1,590	216	1,181	28
Credit cards	1,787	1,819	614	1,803	150
Installment and other					
Individual installment and other	431	460	175	415	25
Commercial banking	334	541	51	429	20
Total	$6,580	$ 7,531	$ 1,334	$ 6,983	$ 342

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount and direct write-downs and includes accrued interest only on credit card loans.

(2) $607 million of residential first mortgages, $370 million of home equity loans and $10 million of commercial banking loans do not have a specific allowance.

(3) Included in the Allowance for loan losses.

(4)

Average carrying value represents the average recorded investment ending balance for the last four quarters and does not include the related specific allowance.

(5) Includes amounts recognized on both an accrual and cash basis.

(6) Interest income recognized for the year ended December 31, 2016 was $402 million.

Consumer Troubled Debt Restructurings

In millions of dollars, except number of loans modified	At and for the year ended December 31, 2018 Number of loans modified	Post-modification recorded investment[1][2]	Deferred principal[3]	Contingent principal forgiveness[4]	Principal forgiveness[5]	Average interest rate reduction
North America						
Residential first mortgages	2,019	$ 300	$ 2	$ —	$ —	— %
Home equity loans	1,381	130	5	—	—	1
Credit cards	243,253	978	—	—	—	18
Installment and other revolving	1,320	10	—	—	—	5
Commercial banking[6]	43	6	—	—	—	—
Total[8]	248,016	$ 1,424	$ 7	$ —	$ —	
International						
Residential first mortgages	2,572	$ 85	$ —	$ —	$ —	— %
Credit cards	77,823	323	—	—	9	16
Installment and other revolving	30,344	182	—	—	7	10
Commercial banking[6]	526	70	—	—	—	1
Total[8]	111,265	$ 660	$ —	$ —	$ 16	

In millions of dollars, except number of loans modified	At and for the year ended December 31, 2017 Number of loans modified	Post-modification recorded investment[1][7]	Deferred principal[3]	Contingent principal forgiveness[4]	Principal forgiveness[5]	Average interest rate reduction
North America						
Residential first mortgages	4,063	$ 580	$ 6	$ —	$ 2	1 %
Home equity loans	2,807	247	16	—	1	1
Credit cards	230,042	880	—	—	—	17
Installment and other revolving	1,088	8	—	—	—	5
Commercial banking[6]	112	117	—	—	—	—
Total[8]	238,112	$ 1,832	$ 22	$ —	$ 3	
International						
Residential first mortgages	4,477	$ 123	$ —	$ —	$ —	— %
Credit cards	115,941	399	—	—	7	11
Installment and other revolving	44,880	254	—	—	11	9
Commercial banking[6]	370	50	—	—	—	—
Total[8]	165,668	$ 826	$ —	$ —	$ 18	

(1) Post-modification balances include past due amounts that are capitalized at the modification date.

(2) Post-modification balances in North America include $38 million of residential first mortgages and $12 million of home equity loans to borrowers who have gone through Chapter 7 bankruptcy in the year ended December 31, 2018. These amounts include $27 million of residential first mortgages and $10 million of home equity loans that were newly classified as TDRs during 2018, based on previously received OCC guidance.

(3) Represents portion of contractual loan principal that is non-interest bearing, but still due from the borrower. Such deferred principal is charged off at the time of permanent modification to the extent that the related loan balance exceeds the underlying collateral value.

(4) Represents portion of contractual loan principal that is non-interest bearing and, depending upon borrower performance, eligible for forgiveness.

(5) Represents portion of contractual loan principal that was forgiven at the time of permanent modification.

(6) Commercial banking loans are generally borrower-specific modifications and incorporate changes in the amount and/or timing of principal and/or interest.

(7) Post-modification balances in North America include $53 million of residential first mortgages and $21 million of home equity loans to borrowers who have gone through Chapter 7 bankruptcy in the year ended December 31, 2017. These amounts include $36 million of residential first mortgages and $18 million of home equity loans that were newly classified as TDRs during 2017, based on previously received OCC guidance.

(8) The above tables reflect activity for loans outstanding that were considered TDRs as of the end of the reporting period.

The following table presents consumer TDRs that defaulted for which the payment default occurred within one year of a permanent modification. Default is defined as 60 days past due, except for classifiably managed commercial banking loans, where default is defined as 90 days past due.

	Years ended December 31,	
In millions of dollars	2018	2017
North America		
Residential first mortgages	$136	$253
Home equity loans	23	46
Credit cards	241	221
Installment and other revolving	3	2
Commercial banking	22	2
Total	$425	$524
International		
Residential first mortgages	$9	$11
Credit cards	198	185
Installment and other revolving	80	96
Commercial banking	17	1
Total	$304	$293

Corporate Loans

Corporate loans represent loans and leases managed by ICG. The following table presents information by corporate loan type:

In millions of dollars	December 31, 2018	December 31, 2017
In U.S. offices		
Commercial and industrial	$ 52,063	$ 51,319
Financial institutions	48,447	39,128
Mortgage and real estate[1]	50,124	44,683
Installment, revolving credit and other	33,247	33,181
Lease financing	1,429	1,470
Total	$ 185,310	$ 169,781
In offices outside the U.S.		
Commercial and industrial	$ 94,701	$ 93,750
Financial institutions	36,837	35,273
Mortgage and real estate[1]	7,376	7,309
Installment, revolving credit and other	25,684	22,638
Lease financing	103	190
Governments and official institutions	4,520	5,200
Total	$ 169,221	$ 164,360
Total corporate loans	$ 354,531	$ 334,141
Net unearned income	$ (822)	$ (763)
Corporate loans, net of unearned income	$ 353,709	$ 333,378

(1) Loans secured primarily by real estate.

The Company sold and/or reclassified to held-for-sale $1.0 billion of corporate loans during each of the years ended December 31, 2018 and 2017, respectively. The Company did not have significant purchases of corporate loans classified as held-for-investment for the years ended December 31, 2018 or 2017.

Delinquency Status

Citi generally does not manage corporate loans on a delinquency basis. Corporate loans are identified as impaired and placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due, except when the loan is well collateralized and in the process of collection. Any interest accrued on impaired corporate loans and leases is reversed at 90 days and charged against current earnings, and interest is thereafter included in earnings only to the extent actually received in cash. When there is doubt regarding the ultimate collectability of principal, all cash receipts are thereafter applied to reduce the recorded investment in the loan. While corporate loans are generally managed based on their internally assigned risk rating (see further discussion below), the following tables present delinquency information by corporate loan type.

Corporate Loan Delinquency and Non-Accrual Details at December 31, 2018

In millions of dollars	30–89 days past due and accruing[1]	≥ 90 days past due and accruing[1]	Total past due and accruing	Total non-accrual[2]	Total current[3]	Total loans[4]
Commercial and industrial	$ 365	$ 42	$ 407	$ 919	$143,960	$145,286
Financial institutions	87	7	94	102	83,672	83,868
Mortgage and real estate	128	5	133	215	57,116	57,464
Leases	5	10	15	—	1,516	1,531
Other	151	52	203	75	62,079	62,357
Loans at fair value						3,203
Total	$ 736	$ 116	$ 852	$ 1,311	$348,343	$353,709

Corporate Loan Delinquency and Non-Accrual Details at December 31, 2017

In millions of dollars	30–89 days past due and accruing[1]	≥ 90 days past due and accruing[1]	Total past due and accruing	Total non-accrual[2]	Total current[3]	Total loans[4]
Commercial and industrial	$ 249	$ 13	$ 262	$ 1,506	$139,554	$141,322
Financial institutions	93	15	108	92	73,557	73,757
Mortgage and real estate	147	59	206	195	51,563	51,964
Leases	68	8	76	46	1,533	1,655
Other	70	13	83	103	60,145	60,331
Loans at fair value						4,349
Total	$ 627	$ 108	$ 735	$ 1,942	$326,352	$333,378

(1) Corporate loans that are 90 days past due are generally classified as non-accrual. Corporate loans are considered past due when principal or interest is contractually due but unpaid.

(2) Non-accrual loans generally include those loans that are ≥ 90 days past due or those loans for which Citi believes, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful.

(3) Loans less than 30 days past due are presented as current.

(4) Total loans include loans at fair value, which are not included in the various delinquency columns.

Citigroup has a risk management process to monitor, evaluate and manage the principal risks associated with its corporate loan portfolio. As part of its risk management process, Citi assigns numeric risk ratings to its corporate loan facilities based on quantitative and qualitative assessments of the obligor and facility. These risk ratings are reviewed at least annually or more often if material events related to the obligor or facility warrant. Factors considered in assigning the risk ratings include financial condition of the obligor, qualitative assessment of management and strategy, amount and sources of repayment, amount and type of collateral and guarantee arrangements, amount and type of any contingencies associated with the obligor and the obligor's industry and geography.

The obligor risk ratings are defined by ranges of default probabilities. The facility risk ratings are defined by ranges of loss norms, which are the product of the probability of default and the loss given default. The investment grade rating categories are similar to the category BBB-/Baa3 and above as defined by S&P and Moody's. Loans classified according to the bank regulatory definitions as special mention, substandard and doubtful will have risk ratings within the non-investment grade categories.

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Corporate Loans Credit Quality Indicators

In millions of dollars	Recorded investment in loans[1] December 31, 2018	December 31, 2017
Investment grade[2]		
Commercial and industrial	$102,722	$ 101,313
Financial institutions	73,080	60,404
Mortgage and real estate	25,855	23,213
Leases	1,036	1,090
Other	57,299	56,306
Total investment grade	$259,992	$ 242,326
Non-investment grade[2]		
Accrual		
Commercial and industrial	$41,645	$ 38,503
Financial institutions	10,686	13,261
Mortgage and real estate	3,793	2,881
Leases	496	518
Other	4,981	3,924
Non-accrual		
Commercial and industrial	919	1,506
Financial institutions	102	92
Mortgage and real estate	215	195
Leases	—	46
Other	75	103
Total non-investment grade	$62,912	$ 61,029
Non-rated private bank loans managed on a delinquency basis[2]	$27,602	$ 25,674
Loans at fair value	3,203	4,349
Corporate loans, net of unearned income	$353,709	$ 333,378

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount, less any direct write-downs.

(2) Held-for-investment loans are accounted for on an amortized cost basis.

Impaired collateral-dependent loans and leases, where repayment is expected to be provided solely by the sale of the underlying collateral and there are no other available and reliable sources of repayment, are written down to the lower of carrying value or collateral value, less cost to sell. Cash-basis loans are returned to an accrual status when all contractual principal and interest amounts are reasonably assured of repayment and there is a sustained period of repayment performance, generally six months, in accordance with the contractual terms of the loan.

Non-Accrual Corporate Loans

The following tables present non-accrual loan information by corporate loan type and interest income recognized on non-accrual corporate loans:

	At and for the year ended December 31, 2018				
In millions of dollars	Recorded investment[1]	Unpaid principal balance	Related specific allowance	Average carrying value[2]	Interest income recognized[3]
Non-accrual corporate loans					
Commercial and industrial	$ 919	$ 1,070	$ 183	$ 1,099	$ 35
Financial institutions	102	123	35	99	—
Mortgage and real estate	215	323	39	233	1
Lease financing	—	28	—	21	—
Other	75	165	6	83	6
Total non-accrual corporate loans	$ 1,311	$ 1,709	$ 263	$ 1,535	$ 42

	At and for the year ended December 31, 2017				
In millions of dollars	Recorded investment[1]	Unpaid principal balance	Related specific allowance	Average carrying value[2]	Interest income recognized[3]
Non-accrual corporate loans					
Commercial and industrial	$ 1,506	$ 1,775	$ 368	$ 1,547	$ 23
Financial institutions	92	102	41	212	1
Mortgage and real estate	195	324	11	183	10
Lease financing	46	46	4	59	—
Other	103	212	2	108	1
Total non-accrual corporate loans	$ 1,942	$ 2,459	$ 426	$ 2,109	$ 35

	December 31, 2018		December 31, 2017	
In millions of dollars	Recorded investment[1]	Related specific allowance	Recorded investment[1]	Related specific allowance
Non-accrual corporate loans with valuation allowances				
Commercial and industrial	$ 603	$ 183	$ 1,017	$ 368
Financial institutions	76	35	88	41
Mortgage and real estate	100	39	51	11
Lease financing	—	—	46	4
Other	24	6	13	2
Total non-accrual corporate loans with specific allowance	$ 803	$ 263	$ 1,215	$ 426
Non-accrual corporate loans without specific allowance				
Commercial and industrial	$ 316		$ 489	
Financial institutions	26		4	
Mortgage and real estate	115		144	
Lease financing	—		—	
Other	51		90	
Total non-accrual corporate loans without specific allowance	$ 508	N/A	$ 727	N/A

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount, less any direct write-downs.

(2) Average carrying value represents the average recorded investment balance and does not include related specific allowance.

(3) Interest income recognized for the year ended December 31, 2016 was $40 million.

N/A Not applicable

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Corporate Troubled Debt Restructurings

The following table presents corporate TDR activity at and for the year ended December 31, 2018:

In millions of dollars	Carrying value of TDRs modified during the period	TDRs involving changes in the amount and/or timing of principal payments[1]	TDRs involving changes in the amount and/or timing of interest payments[2]	TDRs involving changes in the amount and/or timing of both principal and interest payments
Commercial and industrial	$ 113	$ 5	$ 8	$ 100
Mortgage and real estate	60	3	—	57
Total	$ 173	$ 8	$ 8	$ 157

The following table presents corporate TDR activity at and for the year ended December 31, 2017:

In millions of dollars	Carrying value of TDRs modified during the period	TDRs involving changes in the amount and/or timing of principal payments[1]	TDRs involving changes in the amount and/or timing of interest payments[2]	TDRs involving changes in the amount and/or timing of both principal and interest payments
Commercial and industrial	$ 509	$ 131	$ 7	$ 371
Financial institutions	15	—	—	15
Mortgage and real estate	36	—	—	36
Total	$ 560	$ 131	$ 7	$ 422

(1) TDRs involving changes in the amount or timing of principal payments may involve principal forgiveness or deferral of periodic and/or final principal payments. Because forgiveness of principal is rare for corporate loans, modifications typically have little to no impact on the loans' projected cash flows and thus little to no impact on the allowance established for the loans. Charge-offs for amounts deemed uncollectable may be recorded at the time of the restructuring or may have already been recorded in prior periods such that no charge-off is required at the time of the modification.

(2) TDRs involving changes in the amount or timing of interest payments may involve a below-market interest rate.

The following table presents total corporate loans modified in a TDR as well as those TDRs that defaulted and for which the payment default occurred within one year of a permanent modification. Default is defined as 60 days past due, except for classifiably managed commercial banking loans, where default is defined as 90 days past due.

In millions of dollars	TDR balances at December	TDR loans in payment	TDR balances at	TDR loans in payment

	31, 2018	default during the year ended December 31, 2018	December 31, 2017	default during the year ended December 31, 2017
Commercial and industrial	$ 414	$ 70	$ 617	$ 72
Financial institutions	25	—	48	—
Mortgage and real estate	123	—	101	—
Lease financing	—	—	7	—
Other	2	—	45	—
Total[(1)]	$ 564	$ 70	$ 818	$ 72

(1) The above tables reflect activity for loans outstanding that were considered TDRs as of the end of the reporting period.

15. ALLOWANCE FOR CREDIT LOSSES

In millions of dollars	2018	2017	2016
Allowance for loan losses at beginning of period	$12,355	$12,060	$12,626
Gross credit losses	(8,665)	(8,673)	(8,222)
Gross recoveries[1]	1,552	1,597	1,661
Net credit losses (NCLs)	$(7,113)	$(7,076)	$(6,561)
NCLs	$7,113	$7,076	$6,561
Net reserve builds (releases)	394	544	340
Net specific reserve releases	(153)	(117)	(152)
Total provision for loan losses	$7,354	$7,503	$6,749
Other, net (see table below)	(281)	(132)	(754)
Allowance for loan losses at end of period	$12,315	$12,355	$12,060
Allowance for credit losses on unfunded lending commitments at beginning of period	$1,258	$1,418	$1,402
Provision (release) for unfunded lending commitments	113	(161)	29
Other, net	(4)	1	(13)
Allowance for credit losses on unfunded lending commitments at end of period[2]	$1,367	$1,258	$1,418
Total allowance for loans, leases and unfunded lending commitments	$13,682	$13,613	$13,478

(1) Recoveries have been reduced by certain collection costs that are incurred only if collection efforts are successful.

(2) Represents additional credit loss reserves for unfunded lending commitments and letters of credit recorded in Other liabilities on the Consolidated Balance Sheet.

Other, net details

In millions of dollars	2018	2017	2016
Sales or transfers of various consumer loan portfolios to HFS			
Transfer of real estate loan portfolios	$(91)	$(106)	$(106)
Transfer of other loan portfolios	(110)	(155)	(468)
Sales or transfers of various consumer loan portfolios to HFS	$(201)	$(261)	$(574)
FX translation, consumer	(60)	115	(199)
Other	(20)	14	19
Other, net	$(281)	$(132)	$(754)

Allowance for Credit Losses and End-of-Period Loans at December 31, 2018

In millions of dollars	Corporate	Consumer	Total
Allowance for loan losses at beginning of year	$2,486	$9,869	$12,355
Charge-offs	(271)	(8,394)	(8,665)
Recoveries	102	1,450	1,552
Replenishment of net charge-offs	169	6,944	7,113
Net reserve builds (releases)	56	338	394
Net specific reserve builds (releases)	(159)	6	(153)
Other	(18)	(263)	(281)
Ending balance	$2,365	$9,950	$12,315
Allowance for loan losses			
Collectively evaluated in accordance with ASC 450	$2,102	$8,770	$10,872
Individually evaluated in accordance with ASC 310-10-35	263	1,178	1,441
Purchased credit impaired in accordance with ASC 310-30	—	2	2
Total allowance for loan losses	$2,365	$9,950	$12,315
Loans, net of unearned income			
Collectively evaluated in accordance with ASC 450	$349,292	$325,055	$674,347
Individually evaluated in accordance with ASC 310-10-35	1,214	5,284	6,498
Purchased credit impaired in accordance with ASC 310-30	—	128	128
Held at fair value	3,203	20	3,223
Total loans, net of unearned income	$353,709	$330,487	$684,196

Allowance for Credit Losses and End-of-Period Loans at December 31, 2017

In millions of dollars	Corporate	Consumer	Total
Allowance for loan losses at beginning of year	$2,702	$9,358	$12,060
Charge-offs	(491)	(8,182)	(8,673)
Recoveries	112	1,485	1,597
Replenishment of net charge-offs	379	6,697	7,076
Net reserve builds (releases)	(267)	811	544
Net specific reserve builds (releases)	28	(145)	(117)
Other	23	(155)	(132)
Ending balance	$2,486	$9,869	$12,355
Allowance for loan losses			
Collectively evaluated in accordance with ASC 450	$2,060	$8,531	$10,591
Individually evaluated in accordance with ASC 310-10-35	426	1,334	1,760
Purchased credit impaired in accordance with ASC 310-30	—	4	4
Total allowance for loan losses	$2,486	$9,869	$12,355
Loans, net of unearned income			
Collectively evaluated in accordance with ASC 450	$327,142	$326,884	$654,026
Individually evaluated in accordance with ASC 310-10-35	1,887	6,580	8,467
Purchased credit impaired in accordance with ASC 310-30	—	167	167
Held at fair value	4,349	25	4,374
Total loans, net of unearned income	$333,378	$333,656	$667,034

Allowance for Credit Losses at December 31, 2016

In millions of dollars	Corporate	Consumer	Total
Allowance for loan losses at beginning of year	$ 2,791	$ 9,835	$ 12,626
Charge-offs	(580)	(7,642)	(8,222)
Recoveries	67	1,594	1,661
Replenishment of net charge-offs	513	6,048	6,561
Net reserve builds (releases)	(85)	425	340
Net specific reserve builds (releases)	—	(152)	(152)
Other	(4)	(750)	(754)
Ending balance	$ 2,702	$ 9,358	$ 12,060

16. GOODWILL AND INTANGIBLE ASSETS

Goodwill

The changes in Goodwill were as follows:

In millions of dollars	
Balance at December 31, 2015	$22,349
Foreign exchange translation and other	$(613)
Divestitures[1]	(77)
Balance at December 31, 2016	$21,659
Foreign exchange translation and other	$729
Divestitures[2]	(104)
Impairment of goodwill [3]	(28)
Balance at December 31, 2017	$22,256
Foreign exchange translation and other	$(194)
Divestitures[4]	(16)
Balance at December 31, 2018	$22,046

The changes in Goodwill by segment were as follows:

In millions of dollars	Global Consumer Banking	Institutional Clients Group	Corporate/Other	Total
Balance at December 31, 2016	$ 12,530	$ 9,085	$ 44	$21,659
Foreign exchange translation and other	$ 286	$ 443	$ —	$729
Divestitures[2]	(32)	(72)	—	(104)
Impairment of goodwill[3]	—	—	(28)	(28)
Balance at December 31, 2017	$ 12,784	$ 9,456	$ 16	$22,256
Foreign exchange translation and other	$ (41)	$ (153)	$ —	$(194)
Divestitures[4]	—	—	(16)	(16)
Balance at December 31, 2018	$ 12,743	$ 9,303	$ —	$22,046

(1) Primarily related to the sale of the private equity services business completed in 2016 and agreements to sell Argentina and Brazil consumer operations as of December 31, 2016.

(2) Primarily related to the sale of a fixed income analytics business and a fixed income index business completed in 2017 and agreement to sell a Mexico asset management business as of December 31, 2017. See Note 2 to the Consolidated Financial Statements.

(3) Related to the transfer of the mortgage servicing business from North America GCB to Corporate/Other effective January 1, 2017.

(4) Primarily related to the sale of consumer operations in Colombia in 2018.

Goodwill impairment testing is performed at the level below each business segment (referred to as a reporting unit). See Note 3 for further information on business segments.

The Company performed its annual goodwill impairment test as of July 1, 2018. The fair values of the Company's reporting units exceeded their carrying values by approximately 14% to 243% and no reporting unit is at risk of impairment. Further, there were no triggering events identified and no goodwill was impaired during the year.

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Intangible Assets

The components of intangible assets were as follows:

In millions of dollars	December 31, 2018 Gross carrying amount	Accumulated amortization	Net carrying amount	December 31, 2017 Gross carrying amount	Accumulated amortization	Net carrying amount
Purchased credit card relationships	$5,733	$ 3,936	$ 1,797	$5,375	$ 3,836	$ 1,539
Credit card contract related intangibles[1]	5,225	2,791	2,434	5,045	2,456	2,589
Core deposit intangibles	419	415	4	639	628	11
Other customer relationships	470	299	171	459	272	187
Present value of future profits	32	29	3	32	28	4
Indefinite-lived intangible assets	218	—	218	244	—	244
Other	84	75	9	100	86	14
Intangible assets (excluding MSRs)	$12,181	$ 7,545	$ 4,636	$11,894	$ 7,306	$ 4,588
Mortgage servicing rights (MSRs)[2]	584	—	584	558	—	558
Total intangible assets	$12,765	$ 7,545	$ 5,220	$12,452	$ 7,306	$ 5,146

(1) Primarily reflects contract-related intangibles associated with the American Airlines, The Home Depot, Costco, Sears and AT&T credit card program agreements, which represented 97% of the aggregate net carrying amount as of December 31, 2018.

(2) For additional information on Citi's MSRs, see Note 21 to the Consolidated Financial Statements.

Intangible assets amortization expense was $557 million, $603 million and $595 million for 2018, 2017 and 2016, respectively. Intangible assets amortization expense is estimated to be $533 million in 2019, $394 million in 2020, $376 million in 2021, $915 million in 2022 and $214 million in 2023.

The changes in intangible assets were as follows:

In millions of dollars	Net carrying amount at December 31, 2017	Acquisitions/ divestitures	Amortization	FX translation and other	Net carrying amount at December 31, 2018
Purchased credit card relationships[1]	$ 1,539	$ 429	$ (173)	$ 2	$ 1,797
Credit card contract-related intangibles[2]	2,589	185	(339)	(1)	2,434
Core deposit intangibles	11	—	(8)	1	4
Other customer relationships	187	—	(25)	9	171
Present value of future profits	4	—	—	(1)	3
Indefinite-lived intangible assets	244	—	—	(26)	218
Other	14	—	(12)	7	9
Intangible assets (excluding MSRs)	$ 4,588	$ 614	$ (557)	$ (9)	$ 4,636
Mortgage servicing rights (MSRs)[3]	558				584
Total intangible assets	$ 5,146				$ 5,220

(1) Reflects intangibles for the value of cardholder relationships, which are discrete from partner contract intangibles and include credit card accounts primarily in the Costco, Macy's and Sears portfolios. The increase since December 31, 2017 reflects the purchase of certain rights related to credit card accounts in the Sears portfolio.

(2) Primarily reflects contract-related intangibles associated with the American Airlines, Costco, The Home Depot, Sears and AT&T credit card program agreements, which represent 97% of the aggregate net carrying amount as of December 31, 2018.

(3)

For additional information on Citi's MSRs, including the rollforward from 2017 to 2018, see Note 21 to the Consolidated Financial Statements.

17. DEBT

Short-Term Borrowings

	December 31, 2018		2017	
In millions of dollars	Balance	Weighted average coupon	Balance	Weighted average coupon
Commercial paper	$13,238	1.95 %	$9,940	1.28 %
Other borrowings[1]	19,108	2.99	34,512	1.62
Total	$32,346		$44,452	

(1) Includes borrowings from the Federal Home Loan Banks and other market participants. At December 31, 2018 and 2017, collateralized short-term advances from the Federal Home Loan Banks were $9.5 billion and $23.8 billion, respectively.

Borrowings under bank lines of credit may be at interest rates based on LIBOR, CD rates, the prime rate or bids submitted by the banks. Citigroup pays commitment fees for its lines of credit.

Some of Citigroup's non-bank subsidiaries have credit facilities with Citigroup's subsidiary depository institutions, including Citibank. Borrowings under these facilities are secured in accordance with Section 23A of the Federal Reserve Act.

Citigroup Global Markets Holdings Inc. (CGMHI) has borrowing agreements consisting of facilities that CGMHI has been advised are available, but where no contractual lending obligation exists. These arrangements are reviewed on an ongoing basis to ensure flexibility in meeting CGMHI's short-term requirements.

Long-Term Debt

			Balances at December 31,	
In millions of dollars	Weighted average coupon[1]	Maturities	2018	2017
Citigroup Inc.[2]				
Senior debt	3.40 %	2019-2098	$117,511	$123,488
Subordinated debt[3]	4.70	2019-2048	24,545	26,963
Trust preferred securities	8.44	2036-2067	1,711	1,712
Bank[4]				
Senior debt	2.71	2019-2038	61,237	65,856
Broker-dealer[5]				
Senior debt	3.25	2019-2067	26,947	18,666
Subordinated debt[3]	5.35	2021-2047	48	24
Total	3.87 %		$231,999	$236,709
Senior debt			$205,695	$208,010
Subordinated debt[3]			24,593	26,987
Trust preferred securities			1,711	1,712
Total			$231,999	$236,709

(1) The weighted average contractual rates exclude structured notes accounted for at fair value.
(2) Represents the parent holding company.
(3) Includes notes that are subordinated within certain countries, regions or subsidiaries.

(4) Represents Citibank entities as well as other bank entities. At December 31, 2018 and 2017, collateralized long-term advances from the Federal Home Loan Banks were $10.5 billion and $19.3 billion, respectively.

(5) Represents broker-dealer and other non-bank subsidiaries that are consolidated into Citigroup Inc., the parent holding company.

The Company issues both fixed- and variable-rate debt in a range of currencies. It uses derivative contracts, primarily interest rate swaps, to effectively convert a portion of its fixed-rate debt to variable-rate debt. The maturity structure of the derivatives generally corresponds to the maturity structure of the debt being hedged. In addition, the Company uses other derivative contracts to manage the foreign exchange impact of certain debt issuances. At December 31, 2018, the Company’s overall weighted average interest rate for long-term debt, excluding structured notes accounted for at fair value, was 3.87% on a contractual basis and 3.84% including the effects of derivative contracts.

Aggregate annual maturities of long-term debt obligations (based on final maturity dates) including trust preferred securities are as follows:

In millions of dollars	2019	2020	2021	2022	2023	Thereafter	Total
Citigroup Inc.	$14,144	$9,266	$14,758	$9,944	$14,361	$ 81,295	$143,768
Bank	18,809	21,620	10,877	2,595	2,572	4,764	61,237
Broker-dealer	5,637	6,417	2,907	1,556	2,128	8,349	26,994
Total	$38,590	$37,303	$28,542	$14,095	$19,061	$ 94,408	$231,999

The following table summarizes the Company's outstanding trust preferred securities at December 31, 2018:

						Junior subordinated debentures owned by trust		
Trust	Issuance date	Securities issued	Liquidation value[1]	Coupon rate[2]	Common shares issued to parent	Amount	Maturity	Redeemable by issuer beginning
In millions of dollars, except share amounts								
Citigroup Capital III	Dec. 1996	194,053	$ 194	7.625 %	6,003	$200	Dec. 1, 2036	Not redeemable
Citigroup Capital XIII	Sept. 2010	89,840,000	2,246	3 mo LIBOR + 637 bps	1,000	2,246	Oct. 30, 2040	Oct. 30, 2015
Citigroup Capital XVIII	June 2007	99,901	127	3 mo LIBOR + 88.75 bps	50	127	June 28, 2067	June 28, 2017
Total obligated			$ 2,567			$2,573		

Note: Distributions on the trust preferred securities and interest on the subordinated debentures are payable semiannually for Citigroup Capital III and Citigroup Capital XVIII and quarterly for Citigroup Capital XIII.

(1) Represents the notional value received by investors from the trusts at the time of issuance.

(2) In each case, the coupon rate on the subordinated debentures is the same as that on the trust preferred securities.

18. REGULATORY CAPITAL

Citigroup is subject to risk-based capital and leverage standards issued by the Federal Reserve Board, which constitute the U.S. Basel III rules. Citi's U.S.-insured depository institution subsidiaries, including Citibank, are subject to similar standards issued by their respective primary federal bank regulatory agencies. These standards are used to evaluate capital adequacy and include the required minimums

shown in the following table. The regulatory agencies are required by law to take specific, prompt corrective actions with respect to institutions that do not meet minimum capital standards.

The following table sets forth for Citigroup and Citibank the regulatory capital tiers, total risk-weighted assets, quarterly adjusted average total assets, Total Leverage Exposure, risk-based capital ratios and leverage ratios:

In millions of dollars, except ratios	Citigroup			Citibank		
	Stated minimum	Well-capitalized minimum	December 31, 2018	Well-capitalized minimum	December 31, 2018
Common Equity Tier 1 Capital			$139,252		$129,217
Tier 1 Capital			158,122		131,341
Total Capital (Tier 1 Capital + Tier 2 Capital)—Standardized Approach			195,440		155,280
Total Capital (Tier 1 Capital + Tier 2 Capital)—Advanced Approaches			183,144		144,485
Total risk-weighted assets—Standardized Approach			1,174,448		1,030,514
Total risk-weighted assets—Advanced Approaches			1,131,933		927,931
Quarterly adjusted average total assets[1]			1,896,959		1,399,029
Total Leverage Exposure[2]			2,465,641		1,914,817
Common Equity Tier 1 Capital ratio[3]	4.5 %	N/A	11.86 %	6.5 %	12.54 %
Tier 1 Capital ratio[3]	6.0	6.0 %	13.46	8.0	12.75
Total Capital ratio[3]	8.0	10.0	16.18	10.0	15.07
Tier 1 Leverage ratio	4.0	N/A	8.34	5.0	9.39
Supplementary Leverage ratio	3.0	N/A	6.41	6.0	6.86

(1) Tier 1 Leverage ratio denominator.

(2) Supplementary Leverage ratio denominator.

(3) As of December 31, 2018, Citigroup's reportable Common Equity Tier 1 Capital and Tier 1 Capital ratios were the lower derived under the Basel III Standardized Approach, whereas the reportable Total Capital ratios were the lower derived under the Basel III Advanced Approaches framework. Citibank's reportable Common Equity Tier 1 Capital, Tier 1 Capital and Total Capital ratios were the lower derived under the Basel III Standardized Approach.

N/A Not applicable

As indicated in the table above, Citigroup and Citibank were "well capitalized" under the current federal bank regulatory agency definitions as of December 31, 2018.

Banking Subsidiaries—Constraints on Dividends

There are various legal limitations on the ability of Citigroup's subsidiary depository institutions to extend credit, pay dividends, or otherwise supply funds to Citigroup and its non-bank subsidiaries. The approval of the Office of the Comptroller of the Currency is required if total dividends declared in any calendar year were to exceed amounts specified by the agency's regulations.

In determining the dividends, each subsidiary depository institution must also consider its effect on applicable risk-based capital and leverage ratio requirements, as well as policy statements of the federal bank regulatory agencies

that indicate that banking organizations should generally pay dividends out of current operating earnings. Citigroup received $8.3 billion and $7.5 billion in dividends from Citibank during 2018 and 2017, respectively.

19. CHANGES IN ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS) (AOCI)

Changes in each component of Citigroup's Accumulated other comprehensive income (loss) were as follows:

In millions of dollars	Net unrealized gains (losses) on investment securities	Debt valuation adjustment (DVA)[1]	Cash flow hedges[2]	Benefit plans[3]	Foreign currency translation adjustment (CTA), net of hedges[4]	Excluded component of fair value hedges[5]	Accumulated other comprehensive income (loss)
Balance, December 31, 2015	$ (907)	$ —	$ (617)	$ (5,116)	$ (22,704)	$ —	$ (29,344)
Adjustment to opening balance, net of taxes[1]	$ —	$ (15)	$ —	$ —	$ —	$ —	$ (15)
Adjusted balance, beginning of period	$ (907)	$ (15)	$ (617)	$ (5,116)	$ (22,704)	$ —	$ (29,359)
Other comprehensive income before reclassifications	$ 531	$ (335)	$ (88)	$ (208)	$ (2,802)	$ —	$ (2,902)
Increase (decrease) due to amounts reclassified from AOCI	(423)	(2)	145	160	—	—	(120)
Change, net of taxes	$ 108	$ (337)	$ 57	$ (48)	$ (2,802)	$ —	$ (3,022)
Balance, December 31, 2016	$ (799)	$ (352)	$ (560)	$ (5,164)	$ (25,506)	$ —	$ (32,381)
Adjustment to opening balance, net of taxes[6]	$ 504	$ —	$ —	$ —	$ —	$ —	$ 504
Adjusted balance, beginning of period	$ (295)	$ (352)	$ (560)	$ (5,164)	$ (25,506)	$ —	$ (31,877)
Impact of Tax Reform[7]	(223)	(139)	(113)	(1,020)	(1,809)	—	(3,304)
Other comprehensive income before reclassifications	(186)	(426)	(111)	(158)	1,607	—	726
Increase (decrease) due to amounts reclassified from AOCI	(454)	(4)	86	159	—	—	(213)
Change, net of taxes	$ (863)	$ (569)	$ (138)	$ (1,019)	$ (202)	$ —	$ (2,791)
Balance at December 31, 2017	$ (1,158)	$ (921)	$ (698)	$ (6,183)	$ (25,708)	$ —	$ (34,668)
Adjustment to opening balance, net of taxes[8]	(3)	—	—	—	—	—	(3)
Adjusted balance, beginning of period	$ (1,161)	$ (921)	$ (698)	$ (6,183)	$ (25,708)	$ —	$ (34,671)
Other comprehensive income before reclassifications	(866)	1,081	(135)	(240)	(2,607)	(57)	(2,824)
Increase (decrease) due to amounts reclassified from AOCI[9]	(223)	32	105	166	245	—	325
Change, net of taxes	$ (1,089)	$ 1,113	$ (30)	$ (74)	$ (2,362)	$ (57)	$ (2,499)
Balance at December 31, 2018	$ (2,250)	$ 192	$ (728)	$ (6,257)	$ (28,070)	$ (57)	$ (37,170)

(1) Changes in DVA are reflected as a component of AOCI, pursuant to the adoption of only the provisions of ASU 2016-01 relating to the presentation of DVA on fair value option liabilities. See Note 1 to the Consolidated Financial Statements.

(2) Primarily driven by Citi's pay fixed/receive floating interest rate swap programs that hedge the floating rates on liabilities.

(3) Primarily reflects adjustments based on the quarterly actuarial valuations of Citi's significant pension and postretirement plans, annual actuarial valuations of all other plans and amortization of amounts previously recognized in Other comprehensive income.

(4) Primarily reflects the movements in (by order of impact) the Brazilian real, Indian rupee, Mexican peso, and Australian dollar against the U.S. dollar and changes in related tax effects and hedges for the year ended December 31, 2018. Primarily reflects the movements in (by order of impact) the Euro, Mexican peso, Polish zloty and Korean won against the U.S. dollar and changes in related tax effects and hedges for the year ended

December 31, 2017. Primarily reflects the movements in (by order of impact) the Mexican peso, Euro, British pound and Indian rupee against the U.S. dollar and changes in related tax effects and hedges for the year ended December 31, 2016.

(5) Beginning in the first quarter of 2018, changes in the excluded component of fair value hedges are reflected as a component of AOCI, pursuant to the early adoption of ASU No. 2017-12, Targeted Improvements to Accounting for Hedging Activities. See Note 1 of the Consolidated Financial Statements for further information regarding this change.

(6) In the second quarter of 2017, Citi early adopted ASU No. 2017-08. Upon adoption, a cumulative effect adjustment was recorded to reduce Retained earnings, effective January 1, 2017, for the incremental amortization of cumulative fair value hedge adjustments on callable state and municipal debt securities. See Note 1 to the Consolidated Financial Statements.

(7) In the fourth quarter of 2017, Citi adopted ASU 2018-02, which transferred these amounts from AOCI to Retained earnings. See Note 1 to the Consolidated Financial Statements.

(8) Citi adopted ASU 2016-01 and ASU 2018-03 on January 1, 2018. Upon adoption, a cumulative effect adjustment was recorded from AOCI to Retained earnings for net unrealized gains on former AFS equity securities. For additional information, see Note 1 to the Consolidated Financial Statements.

(9) Includes the impact of the release upon meeting the accounting trigger for substantial liquidation of Citi’s Japan Consumer Finance business during the fourth quarter of 2018. See Note 1 to the Consolidated Financial Statements.

The pretax and after-tax changes in each component of Accumulated other comprehensive income (loss) were as follows:

In millions of dollars	Pretax	Tax effect[1]	After-tax
Balance, December 31, 2015	$(38,440)	$9,096	$(29,344)
Adjustment to opening balance[2]	(26)	11	(15)
Adjusted balance, beginning of period	$(38,466)	$9,107	$(29,359)
Change in net unrealized gains (losses) on investment securities	167	(59)	108
Debt valuation adjustment (DVA)	(538)	201	(337)
Cash flow hedges	84	(27)	57
Benefit plans	(78)	30	(48)
Foreign currency translation adjustment	(3,204)	402	(2,802)
Change	$(3,569)	$547	$(3,022)
Balance, December 31, 2016	$(42,035)	$9,654	$(32,381)
Adjustment to opening balance[3]	803	(299)	504
Adjusted balance, beginning of period	$(41,232)	$9,355	$(31,877)
Change in net unrealized gains (losses) on investment securities	(1,088)	225	(863)
Debt valuation adjustment (DVA)	(680)	111	(569)
Cash flow hedges	(37)	(101)	(138)
Benefit plans	14	(1,033)	(1,019)
Foreign currency translation adjustment	1,795	(1,997)	(202)
Change	$4	$(2,795)	$(2,791)
Balance, December 31, 2017	$(41,228)	$6,560	$(34,668)
Adjustment to opening balance[4]	(4)	1	(3)
Adjusted balance, beginning of period	$(41,232)	$6,561	$(34,671)
Change in net unrealized gains (losses) on AFS debt securities	(1,435)	346	(1,089)
Debt valuation adjustment (DVA)	1,415	(302)	1,113
Cash flow hedges	(38)	8	(30)
Benefit plans	(94)	20	(74)
Foreign currency translation adjustment	(2,624)	262	(2,362)
Excluded component of fair value hedges	(74)	17	(57)
Change	$(2,850)	$351	$(2,499)
Balance, December 31, 2018	$(44,082)	$6,912	$(37,170)

(1) In the fourth quarter of 2017, Citi adopted ASU 2018-02, which transferred these amounts from AOCI to Retained earnings. See Note 1 to the Consolidated Financial Statements.

(2) Represents the $(15) million adjustment related to the initial adoption of ASU 2016-01. See Note 1 to the Consolidated Financial Statements.

(3) In the second quarter of 2017, Citi early adopted ASU 2017-08. Upon adoption, a cumulative effect adjustment was recorded to reduce Retained earnings, effective January 1, 2017, for the incremental amortization of cumulative fair value hedge adjustments on callable state and municipal debt securities. See Note 1 to the Consolidated Financial Statements.

(4) Citi adopted ASU 2016-01 and ASU 2018-03 on January 1, 2018. Upon adoption, a cumulative effect adjustment was recorded from AOCI to Retained earnings for net unrealized gains on former AFS equity securities. For additional information, see Note 1 to the Consolidated Financial Statements.

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The Company recognized pretax gains (losses) related to amounts in AOCI reclassified to the Consolidated Statement of Income as follows:

	Increase (decrease) in AOCI due to amounts reclassified to Consolidated Statement of Income Year ended December 31,		
In millions of dollars	2018	2017	2016
Realized (gains) losses on sales of investments	$(421)	$(778)	$(949)
Gross impairment losses	125	63	288
Subtotal, pretax	$(296)	$(715)	$(661)
Tax effect	73	261	238
Net realized (gains) losses on investments, after-tax[1]	$(223)	$(454)	$(423)
Realized DVA (gains) losses on fair value option liabilities	$41	$(7)	$(3)
Subtotal, pretax	$41	$(7)	$(3)
Tax effect	(9)	3	1
Net realized DVA, after-tax	$32	$(4)	$(2)
Interest rate contracts	$131	$126	$140
Foreign exchange contracts	7	10	93
Subtotal, pretax	$138	$136	$233
Tax effect	(33)	(50)	(88)
Amortization of cash flow hedges, after-tax[2]	$105	$86	$145
Amortization of unrecognized			
Prior service cost (benefit)	$(34)	$(42)	$(40)
Net actuarial loss	248	271	272
Curtailment/settlement impact[3]	6	17	18
Subtotal, pretax	$220	$246	$250
Tax effect	(54)	(87)	(90)
Amortization of benefit plans, after-tax[3]	$166	$159	$160
Foreign currency translation adjustment[4]	$34	$—	$—
Tax effect[4]	211	—	—
Foreign currency translation adjustment	$245	$—	$—
Total amounts reclassified out of AOCI, pretax	$137	$(340)	$(181)
Total tax effect	188	127	61
Total amounts reclassified out of AOCI, after-tax	$325	$(213)	$(120)

(1) The pretax amount is reclassified to Realized gains (losses) on sales of investments, net and Gross impairment losses in the Consolidated Statement of Income. See Note 13 to the Consolidated Financial Statements for additional details.

(2) See Note 22 to the Consolidated Financial Statements for additional details.

(3) See Note 8 to the Consolidated Financial Statements for additional details.

(4) Includes the impact of the release upon meeting the accounting trigger for substantial liquidation of Citi’s Japan Consumer Finance business during the fourth quarter of 2018. See Note 1 to the Consolidated Financial Statements.

20. PREFERRED STOCK

The following table summarizes the Company's preferred stock outstanding:

	Issuance date	Redeemable by issuer beginning	Dividend rate	Redemption price per depositary share/preference share	Number of depositary shares	Carrying value in millions of dollars December 31, 2018	December 31, 2017
Series AA[1]	January 25, 2008	February 15, 2018	8.125 %	$ 25	3,870,330	$—	$ 97
Series E[2]	April 28, 2008	April 30, 2018	8.400	1,000	121,254	—	121
Series A[3]	October 29, 2012	January 30, 2023	5.950	1,000	1,500,000	1,500	1,500
Series B[4]	December 13, 2012	February 15, 2023	5.900	1,000	750,000	750	750
Series C[5]	March 26, 2013	April 22, 2018	5.800	25	23,000,000	—	575
Series D[6]	April 30, 2013	May 15, 2023	5.350	1,000	1,250,000	1,250	1,250
Series J[7]	September 19, 2013	September 30, 2023	7.125	25	38,000,000	950	950
Series K[8]	October 31, 2013	November 15, 2023	6.875	25	59,800,000	1,495	1,495
Series L[9]	February 12, 2014	February 12, 2019	6.875	25	19,200,000	480	480
Series M[10]	April 30, 2014	May 15, 2024	6.300	1,000	1,750,000	1,750	1,750
Series N[11]	October 29, 2014	November 15, 2019	5.800	1,000	1,500,000	1,500	1,500
Series O[12]	March 20, 2015	March 27, 2020	5.875	1,000	1,500,000	1,500	1,500
Series P[13]	April 24, 2015	May 15, 2025	5.950	1,000	2,000,000	2,000	2,000
Series Q[14]	August 12, 2015	August 15, 2020	5.950	1,000	1,250,000	1,250	1,250
Series R[15]	November 13, 2015	November 15, 2020	6.125	1,000	1,500,000	1,500	1,500
Series S[16]	February 2, 2016	February 12, 2021	6.300	25	41,400,000	1,035	1,035
Series T[17]	April 25, 2016	August 15, 2026	6.250	1,000	1,500,000	1,500	1,500
						$18,460	$ 19,253

(1) The Series AA preferred stock was redeemed in full on February 15, 2018.

(2) The Series E preferred stock was redeemed in full on April 30, 2018.

(3) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on January 30 and July 30 at a fixed rate until January 30, 2023, thereafter payable quarterly on January 30, April 30, July 30 and October 30 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(4) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on February 15 and August 15 at a fixed rate until February 15, 2023, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(5) The Series C preferred stock was redeemed in full on November 1, 2018.

(6) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until May 15, 2023, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(7) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on March 30, June 30, September 30 and December 30 at a fixed rate until September 30, 2023, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(8) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 15, May 15, August 15 and

November 15 at a fixed rate until November 15, 2023, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(9) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 12, May 12, August 12 and November 12 at a fixed rate, in each case when, as and if declared by the Citi Board of Directors.

(10) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until May 15, 2024, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(11) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, November 15, 2019, and thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(12) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on March 27 and September 27 at a fixed rate until, but excluding, March 27, 2020, and thereafter payable quarterly on March 27, June 27, September 27 and December 27 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(13) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, May 15, 2025, and thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(14) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on February 15 and August 15 at a fixed rate until, but excluding, August 15, 2020, and thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(15) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, November 15, 2020, and thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(16) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 12, May 12, August 12 and November 12 at a fixed rate, in each case when, as and if declared by the Citi Board of Directors.

(17) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on February 15 and August 15 at a fixed rate until August 15, 2026, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

During 2018, Citi distributed $1,173 million in dividends on its outstanding preferred stock. Based on its preferred stock outstanding as of December 31, 2018, Citi estimates it will distribute preferred dividends of approximately $1,109 million during 2019, assuming such dividends are declared by the Citi Board of Directors.

21. SECURITIZATIONS AND VARIABLE INTEREST ENTITIES

Uses of Special Purpose Entities

A special purpose entity (SPE) is an entity designed to fulfill a specific limited need of the company that organized it. The principal uses of SPEs by Citi are to obtain liquidity and favorable capital treatment by securitizing certain financial assets, to assist clients in securitizing their financial assets and to create investment products for clients. SPEs may be organized in various legal forms, including trusts, partnerships or corporations. In a securitization, through the SPE's issuance of debt and equity instruments, certificates, commercial paper or other notes of indebtedness, the company transferring assets to the SPE converts all (or a portion) of those assets into cash before they would have been realized in the normal course of business. These issuances are recorded on the balance sheet of the SPE, which may or may not be consolidated onto the balance sheet of the company that organized the SPE. Investors usually have recourse only to the assets in the SPE, but may also benefit from other credit enhancements, such as a collateral account, a line of credit or a liquidity facility, such as a liquidity put option or asset purchase agreement. Because of these enhancements, the SPE issuances typically obtain a more favorable credit rating than the transferor could obtain for its own debt issuances. This results in less expensive financing costs than unsecured debt. The SPE may also enter into derivative contracts in order to convert the yield or currency of the underlying assets to match the needs of the SPE investors or to limit or change the credit risk of the SPE. Citigroup may be the provider of certain credit enhancements as well as the counterparty to any related derivative contracts.

Most of Citigroup's SPEs are variable interest entities (VIEs), as described below.

Variable Interest Entities

VIEs are entities that have either a total equity investment that is insufficient to permit the entity to finance its activities without additional subordinated financial support or whose equity investors lack the characteristics of a controlling financial interest (i.e., ability to make significant decisions through voting rights or similar rights and a right to receive the expected residual returns of the entity or an obligation to absorb the expected losses of the entity). Investors that finance the VIE through debt or equity interests or other counterparties providing other forms of support, such as guarantees, certain fee arrangements or certain types of derivative contracts, are variable interest holders in the entity.

The variable interest holder, if any, that has a controlling financial interest in a VIE is deemed to be the primary beneficiary and must consolidate the VIE. Citigroup would be deemed to have a controlling financial interest and be the primary beneficiary if it has both of the following characteristics:

- power to direct the activities of the VIE that most significantly impact the entity's economic performance; and
- an obligation to absorb losses of the entity that could potentially be significant to the VIE, or a right to receive benefits from the entity that could potentially be significant to the VIE.

The Company must evaluate each VIE to understand the purpose and design of the entity, the role the Company had in the entity's design and its involvement in the VIE's ongoing activities. The Company then must evaluate which activities most significantly impact the economic performance of the VIE and who has the power to direct such activities.

For those VIEs where the Company determines that it has the power to direct the activities that most significantly impact the VIE's economic performance, the Company must then evaluate its economic interests, if any, and determine whether it could absorb losses or receive benefits that could potentially be significant to the VIE. When evaluating whether the Company has an obligation to absorb losses that could potentially be significant, it considers the maximum exposure to such loss without consideration of probability. Such obligations could be in various forms, including, but not limited to, debt and equity investments, guarantees, liquidity agreements and certain derivative contracts.

In various other transactions, the Company may (i) act as a derivative counterparty (for example, interest rate swap, cross-currency swap or purchaser of credit protection under a credit default swap or total return swap where the

Company pays the total return on certain assets to the SPE), (ii) act as underwriter or placement agent, (iii) provide administrative, trustee or other services or (iv) make a market in debt securities or other instruments issued by VIEs. The Company generally considers such involvement, by itself, not to be variable interests and thus not an indicator of power or potentially significant benefits or losses.

Citigroup's involvement with consolidated and unconsolidated VIEs with which the Company holds significant variable interests or has continuing involvement through servicing a majority of the assets in a VIE is presented below:

	As of December 31, 2018							
				Maximum exposure to loss in significant unconsolidated VIEs[1]				
				Funded exposures[2]		Unfunded exposures		
In millions of dollars	Total involvement with SPE assets	Consolidated VIE/SPE assets	Significant unconsolidated VIE assets[3]	Debt investments	Equity investments	Funding commitments	Guarantees and derivatives	Total
Credit card securitizations	$46,232	$ 46,232	$ —	$—	$ —	$—	$ —	$—
Mortgage securitizations[4]								
U.S. agency-sponsored	116,563	—	116,563	3,038	—	—	60	3,098
Non-agency-sponsored	30,886	1,498	29,388	431	—	—	1	432
Citi-administered asset-backed commercial paper conduits (ABCP)	18,750	18,750	—	—	—	—	—	—
Collateralized loan obligations (CLOs)	21,837	—	21,837	5,891	—	—	9	5,900
Asset-based financing	73,199	628	72,571	21,640	715	9,757	—	32,112
Municipal securities tender option bond trusts (TOBs)	7,998	1,776	6,222	9	—	4,262	—	4,271
Municipal investments	18,044	3	18,041	2,813	3,922	2,738	—	9,473
Client intermediation	858	614	244	172	—	—	2	174
Investment funds	1,272	440	832	12	—	1	1	14
Other	63	3	60	37	—	23	—	60
Total	$335,702	$ 69,944	$ 265,758	$34,043	$ 4,637	$16,781	$ 73	$55,534

	As of December 31, 2017							
				Maximum exposure to loss in significant unconsolidated VIEs[1]				
				Funded exposures[2]		Unfunded exposures		
In millions of dollars	Total involvement with SPE assets	Consolidated VIE/SPE assets	Significant unconsolidated VIE assets[3]	Debt investments	Equity investments	Funding commitments	Guarantees and derivatives	Total
Credit card securitizations	$50,795	$ 50,795	$ —	$—	$ —	$—	$ —	$—
Mortgage securitizations[4]								
U.S. agency-sponsored	116,610	—	116,610	2,647	—	—	74	2,721
Non-agency-sponsored	22,251	2,035	20,216	330	—	—	1	331
Citi-administered asset-backed commercial paper conduits (ABCP)	19,282	19,282	—	—	—	—	—	—
Collateralized loan obligations (CLOs)	20,588	—	20,588	5,956	—	—	9	5,965
Asset-based financing	60,472	633	59,839	19,478	583	5,878	—	25,939
Municipal securities tender option bond trusts (TOBs)	6,925	2,166	4,759	138	—	3,035	—	3,173
Municipal investments	19,119	7	19,112	2,709	3,640	2,344	—	8,693
Client intermediation	958	824	134	32	—	—	9	41
Investment funds	1,892	616	1,276	14	7	13	—	34
Other	677	36	641	27	9	34	47	117

Total	$319,569	$ 76,394	$ 243,175	$31,331	$ 4,239	$11,304	$ 140	$47,014

(1) The definition of maximum exposure to loss is included in the text that follows this table.
(2) Included on Citigroup's December 31, 2018 and 2017 Consolidated Balance Sheet.
(3) A significant unconsolidated VIE is an entity in which the Company has any variable interest or continuing involvement considered to be significant, regardless of the likelihood of loss.
(4) Citigroup mortgage securitizations also include agency and non-agency (private label) re-securitization activities. These SPEs are not consolidated. See "Re-securitizations" below for further discussion.

The previous tables do not include the following:

- certain venture capital investments made by some of the Company's private equity subsidiaries, as the Company accounts for these investments in accordance with the Investment Company Audit Guide (codified in ASC Topic 946);
- certain investment funds for which the Company provides investment management services and personal estate trusts for which the Company provides administrative, trustee and/or investment management services;
- certain VIEs structured by third parties in which the Company holds securities in inventory, as these investments are made on arm's-length terms;
- certain positions in mortgage- and asset-backed securities held by the Company, which are classified as Trading account assets or Investments, in which the Company has no other involvement with the related securitization entity deemed to be significant (for more information on these positions, see Notes 13 and 24 to the Consolidated Financial Statements);
- certain representations and warranties exposures in legacy ICG-sponsored mortgage- and asset-backed securitizations, in which the Company has no variable interest or continuing involvement as servicer. The outstanding balance of mortgage loans securitized during 2005 to 2008 in which the Company has no variable interest or continuing involvement as servicer was approximately $7 billion and $9 billion at December 31, 2018 and 2017, respectively;
- certain representations and warranties exposures in Citigroup residential mortgage securitizations, in which the original mortgage loan balances are no longer outstanding; and
- VIEs such as trust preferred securities trusts used in connection with the Company's funding activities. The Company does not have a variable interest in these trusts.

The asset balances for consolidated VIEs represent the carrying amounts of the assets consolidated by the Company. The carrying amount may represent the amortized cost or the current fair value of the assets depending on the legal form of the asset (e.g., loan or security) and the Company's standard accounting policies for the asset type and line of business.

The asset balances for unconsolidated VIEs in which the Company has significant involvement represent the most current information available to the Company. In most cases, the asset balances represent an amortized cost basis without regard to impairments, unless fair value information is readily available to the Company.

The maximum funded exposure represents the balance sheet carrying amount of the Company's investment in the VIE. It reflects the initial amount of cash invested in the VIE adjusted for any accrued interest and cash principal payments received. The carrying amount may also be adjusted for increases or declines in fair value or any impairment in value recognized in earnings. The maximum exposure of unfunded positions represents the remaining undrawn committed amount, including liquidity and credit facilities provided by the Company or the notional amount of a derivative instrument considered to be a variable interest. In certain transactions, the Company has entered into derivative instruments or other arrangements that are not considered variable interests in the VIE (e.g., interest rate swaps, cross-currency swaps or where the Company is the purchaser of credit protection under a credit default swap or total return swap where the Company pays the total return on certain assets to the SPE). Receivables under such arrangements are not included in the maximum exposure amounts.

Funding Commitments for Significant Unconsolidated VIEs—Liquidity Facilities and Loan Commitments
The following table presents the notional amount of liquidity facilities and loan commitments that are classified as funding commitments in the VIE tables above:

In millions of dollars	December 31, 2018		December 31, 2017	
	Liquidity facilities	Loan/equity commitments	Liquidity facilities	Loan/equity commitments
Asset-based financing	$—	$ 9,757	$—	$ 5,878
Municipal securities tender option bond trusts (TOBs)	4,262	—	3,035	—
Municipal investments	—	2,738	—	2,344
Investment funds	—	1	—	13
Other	—	23	—	34
Total funding commitments	$4,262	$ 12,519	$3,035	$ 8,269

Consolidated VIEs
The Company engages in on-balance sheet securitizations, which are securitizations that do not qualify for sales treatment; thus, the assets remain on Citi's Consolidated Balance Sheet, and any proceeds received are recognized as secured liabilities. The consolidated VIEs represent more than a hundred separate entities with which the Company is involved. In general, the third-party investors in the obligations of consolidated VIEs have legal recourse only to the assets of the respective VIEs and do not have such recourse to the Company, except where Citi has provided a guarantee to the investors or is the counterparty to certain

derivative transactions involving the VIE. Thus, Citigroup's maximum legal exposure to loss related to consolidated VIEs is significantly less than the carrying value of the consolidated VIE assets due to outstanding third-party financing. Intercompany assets and liabilities are excluded from Citi's Consolidated Balance Sheet. All VIE assets are restricted from being sold or pledged as collateral. The cash flows from these assets are the only source used to pay down the associated liabilities, which are non-recourse to Citi's general assets. See the Consolidated Balance Sheet for more information about these Consolidated VIE assets and liabilities.

Significant Interests in Unconsolidated VIEs—Balance Sheet Classification
The following table presents the carrying amounts and classification of significant variable interests in unconsolidated VIEs:

In billions of dollars	December 31, 2018	December 31, 2017
Cash	$ —	$ —
Trading account assets	8.7	8.5
Investments	5.0	4.4
Total loans, net of allowance	24.5	22.2
Other	0.5	0.5
Total assets	$ 38.7	$ 35.6

Credit Card Securitizations

The Company securitizes credit card receivables through trusts established to purchase the receivables. Citigroup transfers receivables into the trusts on a non-recourse basis. Credit card securitizations are revolving securitizations; as customers pay their credit card balances, the cash proceeds are used to purchase new receivables and replenish the receivables in the trust.

Substantially all of the Company's credit card securitization activity is through two trusts—Citibank Credit Card Master Trust (Master Trust) and Citibank Omni Master Trust (Omni Trust), with the substantial majority through the Master Trust. These trusts are consolidated entities because, as

servicer, Citigroup has the power to direct the activities that most significantly impact the economic performance of the trusts. Citigroup holds a seller's interest and certain securities issued by the trusts, which could result in exposure to potentially significant losses or benefits from the trusts. Accordingly, the transferred credit card receivables remain on Citi's Consolidated Balance Sheet with no gain or loss recognized. The debt issued by the trusts to third parties is included on Citi's Consolidated Balance Sheet.

Citi utilizes securitizations as one of the sources of funding for its business in North America. The following table reflects amounts related to the Company's securitized credit card receivables:

In billions of dollars	December 31, 2018	December 31, 2017
Ownership interests in principal amount of trust credit card receivables		
Sold to investors via trust-issued securities	$ 27.3	$ 28.8
Retained by Citigroup as trust-issued securities	7.6	7.6
Retained by Citigroup via non-certificated interests	11.3	14.4
Total	$ 46.2	$ 50.8

The following table summarizes selected cash flow information related to Citigroup's credit card securitizations:

In billions of dollars	2018	2017	2016
Proceeds from new securitizations	$6.8	$11.1	$3.3
Pay down of maturing notes	(8.3)	(5.0)	(10.3)

Managed Loans

After securitization of credit card receivables, the Company continues to maintain credit card customer account relationships and provides servicing for receivables transferred to the trusts. As a result, the Company considers the securitized credit card receivables to be part of the business it manages. As Citigroup consolidates the credit card trusts, all managed securitized card receivables are on-balance sheet.

Funding, Liquidity Facilities and Subordinated Interests

As noted above, Citigroup securitizes credit card receivables through two securitization trusts—Master Trust and Omni Trust. The liabilities of the trusts are included on the Consolidated Balance Sheet, excluding those retained by Citigroup.

Master Trust Liabilities (at Par Value)

The Master Trust issues fixed- and floating-rate term notes. Some of the term notes may be issued to multi-seller commercial paper conduits. The weighted average maturity of
the term notes issued by the Master Trust was 3.0 years as of December 31, 2018 and 2.6 years as of December 31, 2017.

In billions of dollars	Dec. 31, 2018	Dec. 31, 2017

Term notes issued to third parties	$ 25.8	$ 27.8
Term notes retained by Citigroup affiliates	5.7	5.7
Total Master Trust liabilities	$ 31.5	$ 33.5

Omni Trust Liabilities (at Par Value)

The Omni Trust issues fixed- and floating-rate term notes, some of which are purchased by multi-seller commercial paper conduits. The weighted average maturity of the third-party term notes issued by the Omni Trust was 1.4 years as of December 31, 2018 and 1.9 years as of December 31, 2017.

In billions of dollars	Dec. 31, 2018	Dec. 31, 2017
Term notes issued to third parties	$ 1.5	$ 1.0
Term notes retained by Citigroup affiliates	1.9	1.9
Total Omni Trust liabilities	$ 3.4	$ 2.9

Mortgage Securitizations

Citigroup provides a wide range of mortgage loan products to a diverse customer base. Once originated, the Company often securitizes these loans through the use of VIEs. These VIEs are funded through the issuance of trust certificates backed solely by the transferred assets. These certificates have the same life as the transferred assets. In addition to providing a source of liquidity and less expensive funding, securitizing these assets also reduces Citi's credit exposure to the borrowers. These mortgage loan securitizations are primarily non-recourse, thereby effectively transferring the risk of future credit losses to the purchasers of the securities issued by the trust.

Citi's U.S. consumer mortgage business generally retains the servicing rights and in certain instances retains investment securities, interest-only strips and residual interests in future cash flows from the trusts and also provides servicing for a limited number of ICG securitizations. Citi's ICG business may hold investment securities pursuant to credit risk retention rules or in connection with secondary market-making activities.

The Company securitizes mortgage loans generally through either a government-sponsored agency, such as Ginnie Mae, Fannie Mae or Freddie Mac (U.S. agency-sponsored mortgages), or private label (non-agency-sponsored mortgages) securitization. Citi is not the primary beneficiary of its U.S. agency-sponsored mortgage securitization entities because Citigroup does not have the power to direct the activities of the VIE that most significantly impact the entity's economic performance. Therefore, Citi does not consolidate these U.S. agency-sponsored mortgage securitization entities. Substantially all of the consumer loans sold or securitized through non-consolidated trusts by Citigroup are U.S. prime residential mortgage loans. Retained interests in non-consolidated agency-sponsored mortgage securitization trusts are classified as Trading account assets, except for MSRs, which are included in Mortgage servicing rights on Citigroup's Consolidated Balance Sheet.

Citigroup does not consolidate certain non-agency-sponsored mortgage securitization entities because Citi is either not the servicer with the power to direct the significant activities of the entity or Citi is the servicer, but the servicing relationship is deemed to be a fiduciary relationship; therefore, Citi is not deemed to be the primary beneficiary of the entity.

In certain instances, the Company has (i) the power to direct the activities and (ii) the obligation to either absorb losses or the right to receive benefits that could be potentially significant to its non-agency-sponsored mortgage securitization entities and, therefore, is the primary beneficiary and, thus, consolidates the VIE.

The following tables summarize selected cash flow information and retained interests related to Citigroup mortgage securitizations:

	2018		2017		2016	
In billions of dollars	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages
Principal securitized	$ 4.0	$ 5.6	$ 7.8	$ 7.3	$ 14.8	$ 0.3
Proceeds from new securitizations[1]	4.2	7.1	8.1	7.3	15.4	0.3
Contractual servicing fees received	0.1	—	0.2	—	0.4	—
Purchases of previously transferred financial assets	0.2	—	0.4	—	0.5	—

Note: Excludes re-securitization transactions.

(1) The proceeds from new securitizations in 2016 include $0.3 billion related to personal loan securitizations.

For non-consolidated mortgage securitization entities where the transfer of loans to the VIE meets the conditions for sale accounting, Citi recognizes a gain or loss based on the difference between the carrying value of the transferred assets and the proceeds received (generally cash but may be beneficial interests or servicing rights).

Agency and non-agency securitization gains for the year ended December 31, 2018 were $17 million and $36 million, respectively.

Agency and non-agency securitization gains for the year ended December 31, 2017 were $28 million and $70 million, respectively, and $76 million and $(5) million, respectively, for the year ended December 31, 2016.

	December 31, 2018			December 31, 2017		
		Non-agency-sponsored mortgages[1]			Non-agency-sponsored mortgages[1]	
In millions of dollars	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Carrying value of retained interests[2]	$564	$ 300	$ 51	$529	$ 132	$ 30

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.

(2) Retained interests consist of Level 2 or Level 3 assets depending on the observability of significant inputs. See Footnote 24 for more information about fair value measurements.

Key assumptions used in measuring the fair value of retained interests at the date of sale or securitization of mortgage receivables were as follows:

	December 31, 2018					
		Non-agency-sponsored mortgages[1]				
	U.S. agency-sponsored mortgages		Senior interests		Subordinated interests	
Weighted average discount rate	9.6	%	2.8	%	4.4	%
Weighted average constant prepayment rate	5.8	%	8.0	%	9.1	%
Weighted average anticipated net credit losses[2]	NM		4.4	%	3.4	%
Weighted average life	7.2 to 7.7 years		2.5 to 9.9 years		2.5 to 15.7 years	

	December 31, 2017					
		Non-agency-sponsored mortgages[1]				
	U.S. agency-sponsored mortgages		Senior interests		Subordinated interests	
Weighted average discount rate	13.7	%	3.1	%	3.9	%
Weighted average constant prepayment rate	6.7	%	4.3	%	4.3	%
Weighted average anticipated net credit losses[2]	NM		7.0	%	8.7	%
Weighted average life	6.5 to 7.5 years		4.3 to 9.4 years		4.3 to 10.0 years	

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.

(2) Anticipated net credit losses represent estimated loss severity associated with defaulted mortgage loans underlying the mortgage securitizations disclosed above. Anticipated net credit losses, in this instance, do not represent total credit losses incurred to date, nor do they represent credit losses expected on retained interests in mortgage securitizations.

NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

The interests retained by Citi range from highly rated and/or senior in the capital structure to unrated and/or residual interests.

The key assumptions used to value retained interests, and the sensitivity of the fair value to adverse changes of 10% and 20% in each of the key assumptions, are presented in the

tables below. The negative effect of each change is calculated independently, holding all other assumptions constant. Because the key assumptions may not be independent, the net effect of simultaneous adverse changes in the key assumptions may be less than the sum of the individual effects shown below.

	December 31, 2018				
		Non-agency-sponsored mortgages[1]			
	U.S. agency-sponsored mortgages	Senior interests		Subordinated interests	
Weighted average discount rate	7.8	%	9.3	%	—
Weighted average constant prepayment rate	9.1	%	8.0	%	—
Weighted average anticipated net credit losses[2]	NM		40.0	%	—
Weighted average life	3.6 to 7.5 years		6.6 years		—

	December 31, 2017			
		Non-agency-sponsored mortgages[1]		
	U.S. agency-sponsored	Senior interests		Subordinated interests

	mortgages		
Weighted average discount rate	12.0 %	5.8 %	—
Weighted average constant prepayment rate	11.2 %	8.9 %	—
Weighted average anticipated net credit losses[2]	NM	46.9 %	—
Weighted average life	3.8 to 6.9 years	4.8 to 5.3 years	—

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.

(2) Anticipated net credit losses represent estimated loss severity associated with defaulted mortgage loans underlying the mortgage securitizations disclosed above. Anticipated net credit losses, in this instance, do not represent total credit losses incurred to date, nor do they represent credit losses expected on retained interests in mortgage securitizations.

NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

In millions of dollars	December 31, 2018 U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages Senior interests	Subordinated interests
Discount rate			
Adverse change of 10%	$ (16)	$ —	$ —
Adverse change of 20%	(32)	—	—
Constant prepayment rate			
Adverse change of 10%	(21)	—	—
Adverse change of 20%	(41)	—	—
Anticipated net credit losses			
Adverse change of 10%	NM	—	—
Adverse change of 20%	NM	—	—

In millions of dollars	December 31, 2017 U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages Senior interests	Subordinated interests
Discount rate			
Adverse change of 10%	$ (21)	$ (2)	$ —
Adverse change of 20%	(40)	(4)	—
Constant prepayment rate			
Adverse change of 10%	(21)	(1)	—
Adverse change of 20%	(40)	(1)	—
Anticipated net credit losses			
Adverse change of 10%	NM	(3)	—
Adverse change of 20%	NM	(7)	—

NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

The following table includes information about loan delinquencies and liquidation losses for assets held in non-consolidated, non-agency-sponsored securitization entities as of December 31, 2018 and 2017:

	Securitized assets		90 days past due		Liquidation losses	
In billions of dollars	2018	2017	2018	2017	2018	2017
Securitized assets						
Residential mortgage	$5.2	$4.9	$0.4	$0.4	$ 0.1	$ 0.1
Commercial and other	13.1	6.8	—	—	—	—
Total	$18.3	$11.7	$0.4	$0.4	$ 0.1	$ 0.1

Mortgage Servicing Rights (MSRs)

In connection with the securitization of mortgage loans, Citi's U.S. consumer mortgage business generally retains the servicing rights, which entitle the Company to a future stream of cash flows based on the outstanding principal balances of the loans and the contractual servicing fee. Failure to service the loans in accordance with contractual

requirements may lead to a termination of the servicing rights and the loss of future servicing fees.

These transactions create intangible assets referred to as MSRs, which are recorded at fair value on Citi's Consolidated Balance Sheet. The fair value of Citi's capitalized MSRs was $584 million and $558 million at December 31, 2018 and 2017, respectively. The MSRs correspond to principal loan balances of $62 billion and $66 billion as of December 31, 2018 and 2017, respectively.

The following table summarizes the changes in capitalized MSRs:

In millions of dollars	2018	2017
Balance, beginning of year	$558	$1,564
Originations	58	96
Changes in fair value of MSRs due to changes in inputs and assumptions	54	65
Other changes[1]	(68)	(110)
Sale of MSRs[2]	(18)	(1,057)
Balance, as of December 31	$584	$558

(1) Represents changes due to customer payments and passage of time.

(2) See Note 2 to the Consolidated Financial Statements for additional information on the exit of the U.S. mortgage servicing operations and sale of MSRs.

The fair value of the MSRs is primarily affected by changes in prepayments of mortgages that result from shifts in mortgage interest rates. Specifically, higher interest rates tend to lead to declining prepayments, which causes the fair value of the MSRs to increase. In managing this risk, Citigroup economically hedges a significant portion of the value of its MSRs through the use of interest rate derivative contracts, forward purchase and sale commitments of mortgage-backed securities and purchased securities all classified as Trading account assets. The Company receives fees during the course of servicing previously securitized mortgages. The amounts of these fees were as follows:

In millions of dollars	2018	2017	2016
Servicing fees	$172	$276	$484
Late fees	4	10	14
Ancillary fees	8	13	17
Total MSR fees	$184	$299	$515

In the Consolidated Statement of Income these fees are primarily classified as Commissions and fees, and changes in MSR fair values are classified as Other revenue.

Re-securitizations

The Company engages in re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. Citi did not transfer non-agency (private label) securities to re-securitization entities during the years ended December 31, 2018 and 2017. These securities are backed by either residential or commercial mortgages and are often structured on behalf of clients.

As of December 31, 2018, the fair value of Citi-retained interests in private label re-securitization transactions structured by Citi totaled approximately $16 million (all related to re-securitization transactions executed prior to 2016), which has been recorded in Trading account assets. Of this amount, all was related to subordinated beneficial interests. As of December 31, 2017, the fair value of Citi-retained interests in private label re-securitization transactions structured by Citi totaled approximately $79 million (all related to re-securitization transactions executed prior to 2016). Of this amount, substantially all was related to subordinated beneficial interests. The original par value of private label re-securitization transactions in which Citi holds a retained interest as of December 31, 2018 and 2017 was approximately $271 million and $887 million, respectively.

The Company also re-securitizes U.S. government-agency guaranteed mortgage-backed (agency) securities. During the years ended December 31, 2018 and 2017, Citi transferred agency securities with a fair value of approximately $26.3 billion and $26.6 billion, respectively, to re-securitization entities.

As of December 31, 2018, the fair value of Citi-retained interests in agency re-securitization transactions structured by Citi totaled approximately $2.5 billion (including $1.4 billion related to re-securitization transactions executed in 2018) compared to $2.1 billion as of December 31, 2017 (including $854 million related to re-securitization transactions executed in 2017), which is recorded in Trading account assets. The original fair value of agency re-securitization transactions in

which Citi holds a retained interest as of December 31, 2018 and 2017 was approximately $70.9 billion and $68.3 billion, respectively.

As of December 31, 2018 and 2017, the Company did not consolidate any private label or agency re-securitization entities.

Citi-Administered Asset-Backed Commercial Paper Conduits

The Company is active in the asset-backed commercial paper conduit business as administrator of several multi-seller commercial paper conduits and also as a service provider to single-seller and other commercial paper conduits sponsored by third parties.

Citi’s multi-seller commercial paper conduits are designed to provide the Company’s clients access to low-cost funding in the commercial paper markets. The conduits purchase assets from or provide financing facilities to clients and are funded by issuing commercial paper to third-party investors. The conduits generally do not purchase assets originated by Citi. The funding of the conduits is facilitated by the liquidity support and credit enhancements provided by the

Company.

As administrator to Citi's conduits, the Company is generally responsible for selecting and structuring assets purchased or financed by the conduits, making decisions regarding the funding of the conduits, including determining the tenor and other features of the commercial paper issued, monitoring the quality and performance of the conduits' assets and facilitating the operations and cash flows of the conduits. In return, the Company earns structuring fees from customers for individual transactions and earns an administration fee from the conduit, which is equal to the income from the client program and liquidity fees of the conduit after payment of conduit expenses. This administration fee is fairly stable, since most risks and rewards of the underlying assets are passed back to the clients. Once the asset pricing is negotiated, most ongoing income, costs and fees are relatively stable as a percentage of the conduit's size.

The conduits administered by Citi do not generally invest in liquid securities that are formally rated by third parties. The assets are privately negotiated and structured transactions that are generally designed to be held by the conduit, rather than actively traded and sold. The yield earned by the conduit on each asset is generally tied to the rate on the commercial paper issued by the conduit, thus passing interest rate risk to the client. Each asset purchased by the conduit is structured with transaction-specific credit enhancement features provided by the third-party client seller, including over-collateralization, cash and excess spread collateral accounts, direct recourse or third-party guarantees. These credit enhancements are sized with the objective of approximating a credit rating of A or above, based on Citi's internal risk ratings. At December 31, 2018 and 2017, the conduits had approximately $18.8 billion and $19.3 billion of purchased assets outstanding, respectively, and had incremental funding commitments with clients of approximately $14.0 billion and $14.5 billion, respectively.

Substantially all of the funding of the conduits is in the form of short-term commercial paper. At December 31, 2018 and 2017, the weighted average remaining lives of the

commercial paper issued by the conduits were approximately 53 and 51 days, respectively.

The primary credit enhancement provided to the conduit investors is in the form of transaction-specific credit enhancements described above. In addition to the transaction-specific credit enhancements, the conduits, other than the government guaranteed loan conduit, have obtained a letter of credit from the Company, which is equal to at least 8% to 10% of the conduit's assets with a minimum of $200 million. The letters of credit provided by the Company to the conduits total approximately $1.7 billion as of December 31, 2018 and 2017. The net result across multi-seller conduits administered by the Company is that, in the event defaulted assets exceed the transaction-specific credit enhancements described above, any losses in each conduit are allocated first to the Company and then to the commercial paper investors.

Citigroup also provides the conduits with two forms of liquidity agreements that are used to provide funding to the conduits in the event of a market disruption, among other events. Each asset of the conduits is supported by a transaction-specific liquidity facility in the form of an asset purchase agreement (APA). Under the APA, the Company has generally agreed to purchase non-defaulted eligible receivables from the conduit at par. The APA is not designed to provide credit support to the conduit, as it generally does not permit the purchase of defaulted or impaired assets. Any funding under the APA will likely subject the underlying conduit clients to increased interest costs. In addition, the Company provides the conduits with program-wide liquidity in the form of short-term lending commitments. Under these commitments, the Company has agreed to lend to the conduits in the event of a short-term disruption in the commercial paper market, subject to specified conditions. The Company receives fees for providing both types of liquidity agreements and considers these fees to be on fair market terms.

Finally, Citi is one of several named dealers in the commercial paper issued by the conduits and earns a market-based fee for providing such services. Along with third-party dealers, the Company makes a market in the commercial paper and may from time to time fund commercial paper pending sale to a third party. On specific dates with less liquidity in the market, the Company may hold in inventory commercial paper issued by conduits administered by the Company, as well as conduits administered by third parties. Separately, in the normal course of business, Citi purchases commercial paper, including commercial paper issued by Citigroup's conduits. At December 31, 2018 and 2017, the Company owned $5.5 billion and $9.3 billion, respectively, of the commercial paper issued by its administered conduits. The Company's investments were not driven by market illiquidity and the Company is not obligated under any agreement to purchase the commercial paper issued by the conduits.

The asset-backed commercial paper conduits are consolidated by Citi. The Company has determined that, through its roles as administrator and liquidity provider, it has the power to direct the activities that most significantly impact the entities' economic performance. These powers include its ability to structure and approve the assets purchased by the conduits, its ongoing surveillance and credit mitigation activities, its ability to sell or repurchase assets out of the

conduits and its liability management. In addition, as a result of all the Company's involvement described above, it was concluded that Citi has an economic interest that could potentially be significant. However, the assets and liabilities of the conduits are separate and apart from those of Citigroup. No assets of any conduit are available to satisfy the creditors of Citigroup or any of its other subsidiaries.

Collateralized Loan Obligations (CLOs)

A collateralized loan obligation (CLO) is a VIE that purchases a portfolio of assets consisting primarily of non-investment grade corporate loans. CLOs issue multiple tranches of debt and equity to investors to fund the asset purchases and pay upfront expenses associated with forming the CLO. A third-party asset manager is contracted by the CLO to purchase the underlying assets from the open market and monitor the credit risk associated with those assets. Over the term of a CLO, the asset manager directs purchases and sales of assets in a manner consistent with the CLO's asset management agreement and indenture. In general, the CLO asset manager will have the power to direct the activities of the entity that most significantly impact the economic performance of the CLO. Investors in a CLO, through their ownership of debt and/or equity in it, can also direct certain activities of the CLO, including removing its asset manager under limited circumstances, optionally redeeming the notes, voting on amendments to the CLO's operating documents and other activities. A CLO has a finite life, typically 12 years.

Citi serves as a structuring and placement agent with respect to the CLOs. Typically, the debt and equity of the CLOs are sold to third-party investors. On occasion, certain Citi entities may purchase some portion of a CLO's liabilities for investment purposes. In addition, Citi may purchase, typically in the secondary market, certain securities issued by the CLOs to support its market making activities.

The Company does not generally have the power to direct the activities that most significantly impact the economic performance of the CLOs, as this power is generally held by a third-party asset manager of the CLO. As such, those CLOs are not consolidated.

The following tables summarize selected cash flow information and retained interests related to Citigroup CLOs:

In millions of dollars	2018	2017	2016
Principal securitized	$ —	$133	$ —
Proceeds from new securitizations	—	133	—
Cash flows received on retained interests and other net cash flows	127	107	39

In millions of dollars	Dec. 31, 2018	Dec. 31, 2017
Carrying value of retained interests	$3,142	$4,079

Key assumptions used in measuring the fair value of retained interests at the date of sale or securitization of CLOs were as follows:

	Dec. 31, 2018	Dec. 31, 2017
Weighted average discount rate	—	1.4%

The key assumptions used to value retained interests in CLOs, and the sensitivity of the fair value to adverse changes of 10% and 20%, are set forth in the tables below:

	Dec. 31, 2018	Dec. 31, 2017
Weighted average discount rate	—	1.1 %

In millions of dollars	Dec. 31, 2018	Dec. 31, 2017
Discount rates		
Adverse change of 10%	$ —	$ (1)
Adverse change of 20%	—	(1)

All of Citi's retained interests were held-to-maturity securities as of December 31, 2018 and substantially all were held-to-maturity securities as of December 31, 2017.

Asset-Based Financing

The Company provides loans and other forms of financing to VIEs that hold assets. Those loans are subject to the same credit approvals as all other loans originated or purchased by the Company. Financings in the form of debt securities or derivatives are, in most circumstances, reported in Trading account assets and accounted for at fair value through earnings. The Company generally does not have the power to direct the activities that most significantly impact these VIEs' economic performance; thus, it does not consolidate them.

The primary types of Citi's asset-based financings, total assets of the unconsolidated VIEs with significant involvement and Citi's maximum exposure to loss are shown below. For Citi to realize the maximum loss, the VIE (borrower) would have to default with no recovery from the assets held by the VIE.

	December 31, 2018	
In millions of dollars	Total unconsolidated VIE assets	Maximum exposure to unconsolidated VIEs
Type		
Commercial and other real estate	$23,918	$ 6,928
Corporate loans	6,731	5,744
Hedge funds and equities	388	53
Airplanes, ships and other assets	41,534	19,387
Total	$72,571	$ 32,112

	December 31, 2017	
In millions of dollars	Total unconsolidated VIE assets	Maximum exposure to unconsolidated VIEs
Type		
Commercial and other real estate	$15,370	$ 5,445
Corporate loans	4,725	3,587
Hedge funds and equities	542	58
Airplanes, ships and other assets	39,202	16,849
Total	$59,839	$ 25,939

Municipal Securities Tender Option Bond (TOB) Trusts

Municipal TOB trusts may hold fixed- or floating-rate, taxable or tax-exempt securities issued by state and local governments and municipalities. TOB trusts are typically structured as single-issuer entities whose assets are purchased from either the Company or from other investors in the municipal securities market. TOB trusts finance the purchase of their municipal assets by issuing two classes of certificates: long-dated, floating rate certificates ("Floaters") that are putable pursuant to a liquidity facility and residual interest certificates ("Residuals"). The Floaters are purchased by third-party investors, typically tax-exempt money market funds. The Residuals are purchased by the original owner of the municipal securities that are being financed.

From Citigroup's perspective, there are two types of TOB trusts: customer and non-customer. Customer TOB trusts are those trusts utilized by customers of the Company to finance their securities, generally municipal securities. The Residuals issued by these trusts are purchased by the customer being financed. Non-customer TOB trusts are generally used by the Company to finance its own municipal securities investments; the Residuals issued by non-customer TOB trusts are purchased by the Company.

With respect to both customer and non-customer TOB trusts, Citi may provide remarketing agent services. If Floaters are optionally tendered and the Company, in its role as remarketing agent, is unable to find a new investor to purchase the optionally tendered Floaters within a specified period of time, Citigroup may, but is not obligated to, purchase the tendered Floaters into its own inventory. The level of the Company's inventory of such Floaters fluctuates.

For certain customer TOB trusts, Citi may also serve as a voluntary advance provider. In this capacity, the Company may, but is not obligated to, make loan advances to customer TOB trusts to purchase optionally tendered Floaters that have not otherwise been successfully remarketed to new investors. Such loans are secured by pledged Floaters. As of December 31, 2018, Citi had no outstanding voluntary advances to customer TOB trusts.

For certain non-customer trusts, the Company also provides credit enhancement. At December 31, 2018 and 2017, none of the municipal bonds owned by non-customer TOB trusts were subject to a credit guarantee provided by the Company.

Citigroup also provides liquidity services to many customer and non-customer trusts. If a trust is unwound early due to an event other than a credit event on the underlying municipal bonds, the underlying municipal bonds are sold out of the trust and bond sale proceeds are used to redeem the outstanding trust certificates. If this results in a shortfall between the bond sale proceeds and the redemption price of the tendered Floaters, the Company, pursuant to the liquidity agreement, would be obligated to make a payment to the trust to satisfy that shortfall. For certain customer TOB trusts, Citigroup has also executed a reimbursement agreement with the holder of the Residual, pursuant to which the Residual holder is obligated to reimburse the Company for any payment the Company makes under the liquidity arrangement. These reimbursement agreements may be subject to daily margining based on changes in the market value of the underlying

municipal bonds. In cases where a third party provides liquidity to a non-customer TOB trust, a similar reimbursement arrangement may be executed, whereby the Company (or a consolidated subsidiary of the Company), as Residual holder, would absorb any losses incurred by the liquidity provider.

For certain other non-customer TOB trusts, Citi serves as tender option provider. The tender option provider arrangement allows Floater holders to put their interests directly to the Company at any time, subject to the requisite notice period requirements, at a price of par.

At December 31, 2018 and 2017, liquidity agreements provided with respect to customer TOB trusts totaled $4.3 billion and $3.2 billion, respectively, of which $2.3 billion and $2.0 billion, respectively, were offset by reimbursement agreements. For the remaining exposure related to TOB transactions, where the residual owned by the customer was at least 25% of the bond value at the inception of the transaction, no reimbursement agreement was executed.

Citi considers both customer and non-customer TOB trusts to be VIEs. Customer TOB trusts are not consolidated by the Company, as the power to direct the activities that most significantly impact the trust's economic performance rests with the customer Residual holder, which may unilaterally cause the sale of the trust's bonds.

Non-customer TOB trusts generally are consolidated because the Company holds the Residual interest and thus has the unilateral power to cause the sale of the trust's bonds.

The Company also provides other liquidity agreements or letters of credit to customer-sponsored municipal investment funds, which are not variable interest entities, and municipality-related issuers that totaled $6.1 billion as of December 31, 2018 and 2017. These liquidity agreements and letters of credit are offset by reimbursement agreements with various term-out provisions.

Municipal Investments

Municipal investment transactions include debt and equity interests in partnerships that finance the construction and rehabilitation of low-income housing, facilitate lending in new or underserved markets or finance the construction or operation of renewable municipal energy facilities. Citi generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits and grants earned from the investments made by the partnership. The Company may also provide construction loans or permanent loans for the development or operation of real estate properties held by partnerships. These entities are generally considered VIEs. The power to direct the activities of these entities is typically held by the general partner. Accordingly, these entities are not consolidated by Citigroup.

Client Intermediation

Client intermediation transactions represent a range of transactions designed to provide investors with specified returns based on the returns of an underlying security, referenced asset or index. These transactions include credit-linked notes and equity-linked notes. In these transactions, the VIE typically obtains exposure to the underlying security, referenced asset or index through a derivative instrument, such as a total-return swap or a credit-default swap. In turn, the VIE issues notes to investors that pay a return based on the specified underlying security, referenced asset or index. The VIE invests the proceeds in a financial asset or a guaranteed insurance contract that serves as collateral for the derivative contract over the term of the transaction. The Company's involvement in these transactions includes being the counterparty to the VIE's derivative instruments and investing in a portion of the notes issued by the VIE. In certain transactions, the investor's maximum risk of loss is limited and the Company absorbs risk of loss above a specified level. Citi does not have the power to direct the activities of the VIEs that most significantly impact their economic performance and thus it does not consolidate them.

Citi's maximum risk of loss in these transactions is defined as the amount invested in notes issued by the VIE and the notional amount of any risk of loss absorbed by Citi through a separate instrument issued by the VIE. The derivative instrument held by the Company may generate a receivable from the VIE (for example, where the Company purchases credit protection from the VIE in connection with the VIE's issuance of a credit-linked note), which is collateralized by the assets owned by the VIE. These derivative instruments are not considered variable interests and any associated receivables are not included in the calculation of maximum exposure to the VIE.

Investment Funds

The Company is the investment manager for certain investment funds and retirement funds that invest in various asset classes including private equity, hedge funds, real estate, fixed income and infrastructure. Citigroup earns a management fee, which is a percentage of capital under management, and may earn performance fees. In addition, for some of these funds the Company has an ownership interest in the investment funds. Citi has also established a number of investment funds as opportunities for qualified employees to invest in private equity investments. The Company acts as investment manager for these funds and may provide employees with financing on both recourse and non-recourse bases for a portion of the employees' investment commitments.

22. DERIVATIVES ACTIVITIES

In the ordinary course of business, Citigroup enters into various types of derivative transactions, which include:

- Futures and forward contracts, which are commitments to buy or sell at a future date a financial instrument, commodity or currency at a contracted price that may be settled in cash or through delivery of an item readily convertible to cash.
- Swap contracts, which are commitments to settle in cash at a future date or dates that may range from a few days to a number of years, based on differentials between specified indices or financial instruments, as applied to a notional principal amount.
- Option contracts, which give the purchaser, for a premium, the right, but not the obligation, to buy or sell within a specified time a financial instrument, commodity or currency at a contracted price that may also be settled in cash, based on differentials between specified indices or prices.

Swaps, forwards and some option contracts are over-the-counter (OTC) derivatives that are bilaterally negotiated with counterparties and settled with those counterparties, except for swap contracts that are novated and "cleared" through central counterparties (CCPs). Futures contracts and other option contracts are standardized contracts that are traded on an exchange with a CCP as the counterparty from the inception of the transaction. Citigroup enters into derivative contracts relating to interest rate, foreign currency, commodity and other market/credit risks for the following reasons:

- Trading Purposes: Citigroup trades derivatives as an active market maker. Citigroup offers its customers derivatives in connection with their risk management actions to transfer, modify or reduce their interest rate, foreign exchange and other market/credit risks or for their own trading purposes. Citigroup also manages its derivative risk positions through offsetting trade activities, controls focused on price verification and daily reporting of positions to senior managers.
- Hedging: Citigroup uses derivatives in connection with its own risk management activities to hedge certain risks or reposition the risk profile of the Company. Hedging may be accomplished by applying hedge accounting in accordance with ASC 815, Derivatives and Hedging, or by an economic hedge. For example, Citigroup issues fixed-rate long-term debt and then enters into a receive-fixed, pay-variable-rate interest rate swap with the same tenor and notional amount to synthetically convert the interest payments to a net variable-rate basis. This strategy is the most common form of an interest rate hedge, as it minimizes net interest cost in certain yield curve environments. Derivatives are also used to manage market risks inherent in specific groups of on-balance sheet assets and liabilities, including AFS securities, commodities and borrowings, as well as other interest-sensitive assets and liabilities. In addition, foreign exchange contracts are used to hedge non-U.S.-dollar-

denominated debt, foreign currency-denominated AFS securities and net investment exposures.

Derivatives may expose Citigroup to market, credit or liquidity risks in excess of the amounts recorded on the Consolidated Balance Sheet. Market risk on a derivative product is the exposure created by potential fluctuations in interest rates, market prices, foreign exchange rates and other factors and is a function of the type of product, the volume of transactions, the tenor and terms of the agreement and the underlying volatility. Credit risk is the exposure to loss in the event of nonperformance by the other party to satisfy a derivative liability where the value of any collateral held by Citi is not adequate to cover such losses. The recognition in earnings of unrealized gains on derivative transactions is subject to management’s assessment of the probability of counterparty default. Liquidity risk is the potential exposure that arises when the size of a derivative position may affect the ability to monetize the position in a reasonable period of time and at a reasonable cost in periods of high volatility and financial stress. Derivative transactions are customarily documented under industry standard master netting agreements, which provide that following an event of default, the non-defaulting party may promptly terminate all transactions between the parties and determine the net amount due to be paid to, or by, the defaulting party. Events of default include (i) failure to make a payment on a derivative transaction that remains uncured following applicable notice and grace periods, (ii) breach of agreement that remains uncured after applicable notice and grace periods, (iii) breach of a representation,

(iv) cross default, either to third-party debt or to other derivative transactions entered into between the parties, or, in some cases, their affiliates, (v) the occurrence of a merger or consolidation that results in a party's becoming a materially weaker credit and (vi) the cessation or repudiation of any applicable guarantee or other credit support document. Obligations under master netting agreements are often secured by collateral posted under an industry standard credit support annex to the master netting agreement. An event of default may also occur under a credit support annex if a party fails to make a collateral delivery that remains uncured following applicable notice and grace periods.

The netting and collateral rights incorporated in the master netting agreements are considered to be legally enforceable if a supportive legal opinion has been obtained from counsel of recognized standing that provides (i) the requisite level of certainty regarding enforceability, and (ii) that the exercise of rights by the non-defaulting party to terminate and close-out transactions on a net basis under these agreements will not be stayed or avoided under applicable law upon an event of default, including bankruptcy, insolvency or similar proceeding.

A legal opinion may not be sought for certain jurisdictions where local law is silent or unclear as to the enforceability of such rights or where adverse case law or conflicting regulation may cast doubt on the enforceability of such rights. In some jurisdictions and for some counterparty types, the insolvency law may not provide the requisite level of certainty. For

example, this may be the case for certain sovereigns, municipalities, central banks and U.S. pension plans.

Exposure to credit risk on derivatives is affected by market volatility, which may impair the ability of counterparties to satisfy their obligations to the Company. Credit limits are established and closely monitored for customers engaged in derivatives transactions. Citi considers the level of legal certainty regarding enforceability of its offsetting rights under master netting agreements and credit support annexes to be an important factor in its risk management process. Specifically, Citi generally transacts much lower volumes of derivatives under master netting agreements where Citi does not have the requisite level of legal certainty regarding enforceability, because such derivatives consume greater amounts of single counterparty credit limits than those executed under enforceable master netting agreements.

Cash collateral and security collateral in the form of G10 government debt securities are often posted by a party to a master netting agreement to secure the net open exposure of the other party; the receiving party is free to commingle/rehypothecate such collateral in the ordinary course of its business. Nonstandard collateral such as corporate bonds, municipal bonds, U.S. agency securities and/or MBS may also be pledged as collateral for derivative transactions. Security collateral posted to open and maintain a master netting agreement with a counterparty, in the form of cash and/or securities, may from time to time be segregated in an account at a third-party custodian pursuant to a tri-party account control agreement.

As of January 1, 2018, Citigroup early adopted ASU 2017-12, Targeted Improvements to Accounting for Hedge Activities. This standard primarily impacts Citi’s accounting for derivatives designated as cash flow hedges and fair value hedges. Refer to the respective sections below for details.

Information pertaining to Citigroup's derivative activities, based on notional amounts, is presented in the table below. Derivative notional amounts are reference amounts from which contractual payments are derived and do not represent a complete and accurate measure of Citi's exposure to derivative transactions. Rather, Citi's derivative exposure arises primarily from market fluctuations (i.e., market risk), counterparty failure (i.e., credit risk) and/or periods of high volatility or financial stress (i.e., liquidity risk), as well as any market valuation adjustments that may be required on the

transactions. Moreover, notional amounts do not reflect the netting of offsetting trades. For example, if Citi enters into a receive-fixed interest rate swap with $100 million notional, and offsets this risk with an identical but opposite pay-fixed position with a different counterparty, $200 million in derivative notionals is reported, although these offsetting positions may result in de minimis overall market risk. Aggregate derivative notional amounts can fluctuate from period to period in the normal course of business based on Citi's market share, levels of client activity and other factors. All derivatives are recorded in Trading account assets/Trading account liabilities on the Consolidated Balance Sheet.

Derivative Notionals

	Hedging instruments under ASC 815		Trading derivative instruments	
In millions of dollars	December 31, 2018	December 31, 2017	December 31, 2018	December 31, 2017
Interest rate contracts				
Swaps	$273,636	$ 189,779	$18,138,686	$18,754,219
Futures and forwards	—	—	4,632,257	6,460,539
Written options	—	—	3,018,469	3,516,131
Purchased options	—	—	2,532,479	3,234,025
Total interest rate contract notionals	$273,636	$ 189,779	$28,321,891	$31,964,914
Foreign exchange contracts				
Swaps	$57,153	$ 37,162	$6,738,158	$5,576,357
Futures, forwards and spot	41,410	33,103	5,115,504	3,097,700
Written options	1,726	3,951	1,566,717	1,127,728
Purchased options	2,104	6,427	1,543,516	1,148,686
Total foreign exchange contract notionals	$102,393	$ 80,643	$14,963,895	$10,950,471
Equity contracts				
Swaps	$—	$ —	$217,580	$215,834
Futures and forwards	—	—	52,053	72,616
Written options	—	—	454,675	389,961
Purchased options	—	—	341,018	328,154
Total equity contract notionals	$—	$ —	$1,065,326	$1,006,565
Commodity and other contracts				
Swaps	$—	$ —	$79,133	$72,431
Futures and forwards	802	23	146,647	153,248
Written options	—	—	62,629	62,045
Purchased options	—	—	61,298	60,526
Total commodity and other contract notionals	$802	$ 23	$349,707	$348,250
Credit derivatives[1]				
Protection sold	$—	$ —	$724,939	$735,142
Protection purchased	—	—	795,649	777,713
Total credit derivatives	$—	$ —	$1,520,588	$1,512,855
Total derivative notionals	$376,831	$ 270,445	$46,221,407	$45,783,055

(1) Credit derivatives are arrangements designed to allow one party (protection buyer) to transfer the credit risk of a "reference asset" to another party (protection seller). These arrangements allow a protection seller to assume the credit risk associated with the reference asset without directly purchasing that asset. The Company enters into credit derivative positions for purposes such as risk management, yield enhancement, reduction of credit concentrations and diversification of overall risk.

The following tables present the gross and net fair values of the Company’s derivative transactions and the related offsetting amounts as of December 31, 2018 and 2017. Gross positive fair values are offset against gross negative fair values by counterparty, pursuant to enforceable master netting agreements. Under ASC 815-10-45, payables and receivables in respect of cash collateral received from or paid to a given counterparty pursuant to a credit support annex are included in the offsetting amount, if a legal opinion supporting the enforceability of netting and collateral rights has been obtained. GAAP does not permit similar offsetting for security collateral.

In addition, the following tables reflect rule changes adopted by clearing organizations that require or allow entities to treat derivative assets, liabilities and the related variation margin as settlement of the related derivative fair value for legal and accounting purposes, as opposed to presenting gross derivative assets and liabilities that are subject to collateral, whereby the counterparties would record a related collateral payable or receivable. As a result, the tables reflect a reduction of approximately $100 billion as of both December 31, 2018 and 2017, respectively, of derivative assets and derivative liabilities that previously would have been reported on a gross basis, but are now settled and not subject to collateral. The tables also present amounts that are not permitted to be offset, such as security collateral or cash collateral posted at third-party custodians, but which would be eligible for offsetting to the extent that an event of default occurred and a legal opinion supporting enforceability of the netting and collateral rights has been obtained.

Derivative Mark-to-Market (MTM) Receivables/Payables

In millions of dollars at December 31, 2018	Derivatives classified in Trading account assets/liabilities[1][2]	
Derivatives instruments designated as ASC 815 hedges	Assets	Liabilities
Over-the-counter	$1,631	$172
Cleared	238	53
Interest rate contracts	$1,869	$225
Over-the-counter	$1,402	$736
Cleared	—	4
Foreign exchange contracts	$1,402	$740
Total derivatives instruments designated as ASC 815 hedges	$3,271	$965
Derivatives instruments not designated as ASC 815 hedges		
Over-the-counter	$161,183	$146,909
Cleared	8,489	7,594
Exchange traded	91	99
Interest rate contracts	$169,763	$154,602
Over-the-counter	$159,099	$156,904
Cleared	1,900	1,671
Exchange traded	53	40
Foreign exchange contracts	$161,052	$158,615
Over-the-counter	$18,253	$21,527
Cleared	17	32
Exchange traded	11,623	12,249
Equity contracts	$29,893	$33,808
Over-the-counter	$16,661	$19,894
Exchange traded	894	795
Commodity and other contracts	$17,555	$20,689
Over-the-counter	$6,967	$6,155
Cleared	3,798	4,196
Credit derivatives	$10,765	$10,351
Total derivatives instruments not designated as ASC 815 hedges	$389,028	$378,065
Total derivatives	$392,299	$379,030
Cash collateral paid/received[3]	$11,518	$13,906
Less: Netting agreements[4]	(311,089)	(311,089)
Less: Netting cash collateral received/paid[5]	(38,608)	(29,911)
Net receivables/payables included on the Consolidated Balance Sheet[6]	$54,120	$51,936
Additional amounts subject to an enforceable master netting agreement, but not offset on the Consolidated Balance Sheet		
Less: Cash collateral received/paid	$(767)	$(164)
Less: Non-cash collateral received/paid	(13,509)	(13,354)
Total net receivables/payables[6]	$39,844	$38,418

(1) The derivatives fair values are presented in Note 24 to the Consolidated Financial Statements.

(2) Over-the-counter (OTC) derivatives are derivatives executed and settled bilaterally with counterparties without the use of an organized exchange or central clearing house. Cleared derivatives include derivatives executed bilaterally with a counterparty in the OTC market, but then novated to a central clearing house, whereby the central clearing house becomes the counterparty to both of the original counterparties. Exchange traded derivatives include derivatives executed directly on an organized exchange that provides pre-trade price transparency.

(3) Reflects the net amount of the $41,429 million and $52,514 million of gross cash collateral paid and received, respectively. Of the gross cash collateral paid, $29,911 million was used to offset trading derivative liabilities and,

of the gross cash collateral received, $38,608 million was used to offset trading derivative assets.

(4) Represents the netting of derivative receivable and payable balances with the same counterparty under enforceable netting agreements. Approximately $296 billion, $4 billion and $11 billion of the netting against trading account asset/liability balances is attributable to each of the OTC, cleared and exchange traded derivatives, respectively.

(5) Represents the netting of cash collateral paid and received by counterparty under enforceable credit support agreements. Substantially all cash collateral received and paid is netted against OTC derivative assets and liabilities, respectively.

(6) The net receivables/payables include approximately $5 billion of derivative asset and $7 billion of derivative liability fair values not subject to enforceable master netting agreements, respectively.

In millions of dollars at December 31, 2017	Derivatives classified in Trading account assets/liabilities[1][2]	
Derivatives instruments designated as ASC 815 hedges	Assets	Liabilities
Over-the-counter	$1,969	$134
Cleared	110	92
Interest rate contracts	$2,079	$226
Over-the-counter	$1,143	$1,150
Foreign exchange contracts	$1,143	$1,150
Total derivatives instruments designated as ASC 815 hedges	$3,222	$1,376
Derivatives instruments not designated as ASC 815 hedges		
Over-the-counter	$195,677	$173,937
Cleared	7,129	10,381
Exchange traded	102	95
Interest rate contracts	$202,908	$184,413
Over-the-counter	$119,092	$117,473
Cleared	1,690	2,028
Exchange traded	34	121
Foreign exchange contracts	$120,816	$119,622
Over-the-counter	$17,221	$21,201
Cleared	21	25
Exchange traded	9,736	10,147
Equity contracts	$26,978	$31,373
Over-the-counter	$13,499	$16,362
Exchange traded	604	665
Commodity and other contracts	$14,103	$17,027
Over-the-counter	$12,972	$12,958
Cleared	7,562	8,575
Credit derivatives	$20,534	$21,533
Total derivatives instruments not designated as ASC 815 hedges	$385,339	$373,968
Total derivatives	$388,561	$375,344
Cash collateral paid/received[3]	$7,541	$14,308
Less: Netting agreements[4]	(306,401)	(306,401)
Less: Netting cash collateral received/paid[5]	(38,532)	(35,666)
Net receivables/payables included on the Consolidated Balance Sheet[6]	$51,169	$47,585
Additional amounts subject to an enforceable master netting agreement, but not offset on the Consolidated Balance Sheet		
Less: Cash collateral received/paid	$(872)	$(121)
Less: Non-cash collateral received/paid	(12,739)	(6,929)
Total net receivables/payables[6]	$37,558	$40,535

(1) The derivatives fair values are presented in Note 24 to the Consolidated Financial Statements. Derivative mark-to-market receivables/payables previously reported within Other assets/Other liabilities have been reclassified to Trading account assets/Trading account liabilities to conform with the current-period presentation.

(2) Over-the-counter (OTC) derivatives include derivatives executed and settled bilaterally with counterparties without the use of an organized exchange or central clearing house. Cleared derivatives include derivatives executed bilaterally with a counterparty in the OTC market, but then novated to a central clearing house, whereby the central clearing house becomes the counterparty to both of the original counterparties. Exchange traded derivatives include

derivatives executed directly on an organized exchange that provides pre-trade price transparency.

(3) Reflects the net amount of the $43,207 million and $52,840 million of gross cash collateral paid and received, respectively. Of the gross cash collateral paid, $35,666 million was used to offset trading derivative liabilities and, of the gross cash collateral received, $38,532 million was used to offset trading derivative assets.

(4) Represents the netting of derivative receivable and payable balances with the same counterparty under enforceable netting agreements. Approximately $283 billion, $14 billion and $9 billion of the netting against trading account asset/liability balances is attributable to each of the OTC, cleared and exchange traded derivatives, respectively.

(5) Represents the netting of cash collateral paid and received by counterparty under enforceable credit support agreements. Substantially all cash collateral received and paid is netted against OTC derivative assets and liabilities, respectively.

(6) The net receivables/payables include approximately $6 billion of derivative asset and $8 billion of liability fair values not subject to enforceable master netting agreements, respectively.

For the years ended December 31, 2018, 2017 and 2016, the amounts recognized in Principal transactions in the Consolidated Statement of Income related to derivatives not designated in a qualifying hedging relationship, as well as the underlying non-derivative instruments, are presented in Note 6 to the Consolidated Financial Statements. Citigroup presents this disclosure by showing derivative gains and losses related to its trading activities together with gains and losses related to non-derivative instruments within the same trading portfolios, as this represents how these portfolios are risk managed.

The amounts recognized in Other revenue in the Consolidated Statement of Income related to derivatives not designated in a qualifying hedging relationship are shown below. The table below does not include any offsetting gains (losses) on the economically hedged items to the extent that such amounts are also recorded in Other revenue.

	Gains (losses) included in Other revenue		
	Year ended December 31,		
In millions of dollars	2018	2017	2016
Interest rate contracts	$(25)	$(73)	$51
Foreign exchange	(197)	2,062	(847)
Credit derivatives	(155)	(538)	(1,174)
Total	$(377)	$1,451	$(1,970)

Accounting for Derivative Hedging

Citigroup accounts for its hedging activities in accordance with ASC 815, Derivatives and Hedging. As a general rule, hedge accounting is permitted where the Company is exposed to a particular risk, such as interest rate or foreign exchange risk, that causes changes in the fair value of an asset or liability or variability in the expected future cash flows of an existing asset, liability or a forecasted transaction that may affect earnings.

Derivative contracts hedging the risks associated with changes in fair value are referred to as fair value hedges, while contracts hedging the variability of expected future cash flows are cash flow hedges. Hedges that utilize derivatives or debt instruments to manage the foreign exchange risk associated with equity investments in non-U.S.-dollar-functional-currency foreign subsidiaries (net investment in a foreign operation) are net investment hedges.

To qualify as an accounting hedge under the hedge accounting rules (versus an economic hedge where hedge accounting is not applied), a hedging relationship must be highly effective in offsetting the risk designated as being hedged. The hedging relationship must be formally documented at inception, detailing the particular risk management objective and strategy for the hedge. This includes the item and risk(s) being hedged, the hedging instrument being used and how effectiveness will be assessed. The effectiveness of these hedging relationships is evaluated at hedge inception and on an ongoing basis both on a

retrospective and prospective basis, typically using quantitative measures of correlation, with hedge ineffectiveness measured and recorded in current earnings. Hedge effectiveness assessment methodologies are performed in a similar manner for similar hedges, and are used consistently throughout the hedging relationships. The assessment of effectiveness may exclude changes in the value of the hedged item that are unrelated to the risks being hedged and the changes in fair value of the derivative associated with time value. Prior to January 1, 2018, these excluded items were recognized in current earnings for the hedging derivative, while changes in the value of a hedged item that were not

related to the hedged risk were not recorded. Upon adoption of ASC 2017-12, Citi excludes changes in the cross currency basis associated with cross currency swaps from the assessment of hedge effectiveness and records it in other comprehensive income.

Discontinued Hedge Accounting

A hedging instrument must be highly effective in accomplishing the hedge objective of offsetting either changes in the fair value or cash flows of the hedged item for the risk being hedged. Management may voluntarily de-designate an accounting hedge at any time, but if a hedging relationship is not highly effective, it no longer qualifies for hedge accounting and must be de-designated. Subsequent changes in the fair value of the derivative are recognized in Other revenue or Principal transactions, similar to trading derivatives, with no offset recorded related to the hedged item. For fair value hedges, any changes in the fair value of the hedged item remain as part of the basis of the asset or liability and are ultimately realized as an element of the yield on the item. For cash flow hedges, changes in fair value of the end-user derivative remain in Accumulated other comprehensive income (loss) (AOCI) and are included in the earnings of future periods when the forecasted hedged cash flows impact earnings. However, if it becomes probable that some or all of the hedged forecasted transactions will not occur, any amounts that remain in AOCI related to these transactions must be immediately reflected in Other revenue.

The foregoing criteria are applied on a decentralized basis, consistent with the level at which market risk is managed, but are subject to various limits and controls. The underlying asset, liability or forecasted transaction may be an individual item or a portfolio of similar items.

Fair Value Hedges

Hedging of Benchmark Interest Rate Risk

Citigroup's fair value hedges are primarily hedges of fixed-rate long-term debt or assets, such as available-for-sale debt securities or loans.

For qualifying fair value hedges of interest rate risk, the changes in the fair value of the derivative and the change in the fair value of the hedged item attributable to the hedged risk, either total cash flows or benchmark only cash flows, are presented within Interest revenue or Interest expense based on whether the hedged item is an asset or a liability. Prior to the adoption of ASU 2017-12, the fair value of the derivative was presented in Other revenue or Principal transactions and the difference between the changes in the hedged item and the derivative was defined as ineffectiveness.

Hedging of Foreign Exchange Risk

Citigroup hedges the change in fair value attributable to foreign exchange rate movements in available-for-sale debt securities and long-term debt that are denominated in currencies other than the functional currency of the entity holding the securities or issuing the debt, which may be within or outside the U.S. The hedging instrument may be a forward foreign exchange contract or a cross-currency swap contract. Citigroup considers the premium associated with forward contracts (i.e., the differential between the spot and contractual forward rates) as the cost of hedging; this amount is excluded from the assessment of hedge effectiveness and reflected directly in earnings over the life of the hedge. Beginning January 1, 2018, Citi excludes changes in cross-currency basis associated with cross-currency swaps from the assessment of hedge effectiveness and records it in Other comprehensive income.

Hedging of Commodity Price Risk

Citigroup hedges the change in fair value attributable to spot price movements in physical commodities inventory. The hedging instrument is a futures contract to sell the underlying commodity. In this hedge, the change in the value of the hedged inventory is reflected in earnings, which offsets the change in the fair value of the futures contract that is also reflected in earnings. Although the change in the fair value of the hedging instrument recorded in earnings includes changes in forward rates, Citigroup excludes the differential between the spot and the contractual forward rates under the futures contract from the assessment of hedge effectiveness and amortizes it directly into earnings over the life of the hedge.

The following table summarizes the gains (losses) on the Company's fair value hedges:

	Gains (losses) on fair value hedges[1]			
	Year Ended December 31,			
	2018		2017[2]	2016[2]
In millions of dollars	Other revenue	Net interest revenue	Other revenue	Other revenue
Gain (loss) on the derivatives in designated and qualifying fair value hedges				
Interest rate hedges	$—	$ 794	$(891)	$(753)
Foreign exchange hedges	(225)	—	(824)	(1,415)
Commodity hedges	(140)	—	(17)	182
Total gain (loss) on the derivatives in designated and qualifying fair value hedges	$(365)	$ 794	$(1,732)	$(1,986)
Gain (loss) on the hedged item in designated and qualifying fair value hedges				
Interest rate hedges	$—	$ (747)	$853	$668
Foreign exchange hedges	99	—	969	1,573
Commodity hedges	124	—	18	(210)
Total gain (loss) on the hedged item in designated and qualifying fair value hedges	$223	$ (747)	$1,840	$2,031
Net gain (loss) excluded from assessment of the effectiveness of fair value hedges				
Interest rate hedges	$—	$ (5)	$(7)	$(1)
Foreign exchange hedges[3]	14	—	96	154
Commodity hedges	7	—	1	(28)
Total net gain (loss) excluded from assessment of the effectiveness of fair value hedges	$21	$ (5)	$90	$125

(1) Beginning January 1, 2018, gain (loss) amounts for interest rate risk hedges are included in Interest income/Interest expense, while the remaining amounts including the amounts for interest rate hedges prior to January 1, 2018 are included in Other revenue or Principal transactions on the Consolidated Statement of Income. The accrued interest income on fair value hedges both prior to and after January 1, 2018 is recorded in Net interest revenue and is excluded from this table.

(2) Hedge ineffectiveness recognized in earnings on designated and qualifying fair value hedges for the year ended December 31, 2017 was $(31) million for interest rate hedges and $49 million for foreign exchange hedges, for a total of $18 million. Hedge ineffectiveness recognized in earnings on designated and qualifying fair value hedges for the year ended December 31, 2016 was $(84) million for interest rate hedges and $4 million for foreign exchange hedges, for a total of $(80) million.

(3) Amounts relate to the premium associated with forward contracts (differential between spot and contractual forward rates). These amounts are excluded from the assessment of hedge effectiveness and are reflected directly in earnings. After January 1, 2018, amounts include cross-currency basis, which is recognized in accumulated other comprehensive income. The amount of cross-currency basis that was included in AOCI was $(74) million for the year ended December 31, 2018, none of which was recognized in earnings.

Cumulative Basis Adjustment

Upon electing to apply ASC 815 fair value hedge accounting, the carrying value of the hedged item is adjusted to reflect the cumulative impact of changes in the hedged risk. The hedge basis adjustment, whether arising from an active or de-designated hedge relationship, remains with the hedged item until the hedged item is derecognized from the balance sheet. The table below presents the carrying amount of Citi's hedged assets and liabilities under qualifying fair value hedges at December 31, 2018, along with the cumulative hedge basis adjustments included in the carrying value of those hedged assets and liabilities.

In millions of dollars as of December 31, 2018

Balance sheet line item in which hedged item is recorded	Carrying amount of hedged asset/ liability	Cumulative fair value hedging adjustment increasing (decreasing) the carrying amount	
		Active	De-designated
Debt securities AFS	$81,632	$(196)	$ 295
Long-term debt	149,054	1,211	869

Cash Flow Hedges

Citigroup hedges the variability of forecasted cash flows associated with floating-rate assets/liabilities and other forecasted transactions. Variable cash flows from those liabilities are synthetically converted to fixed-rate cash flows by entering into receive-variable, pay-fixed interest rate swaps and receive-variable, pay-fixed forward-starting interest rate swaps. Variable cash flows associated with certain assets are synthetically converted to fixed-rate cash flows by entering into receive-fixed, pay-variable interest rate swaps. These cash flow hedging relationships use either regression analysis or dollar-offset ratio analysis to assess whether the hedging relationships are highly effective at inception and on an ongoing basis. Prior to the adoption of ASU 2017-12, Citigroup designated the risk being hedged as the risk of overall variability in the hedged cash flows for certain items.

With the adoption of ASU 2017-12, Citigroup hedges the variability from changes in a contractually specified rate and recognizes the entire change in fair value of the cash flow hedging instruments in AOCI. Prior to the adoption of ASU 2017-12, to the extent that these derivatives were not fully effective, changes in their fair values in excess of changes in the value of the hedged transactions were immediately included in Other revenue. With the adoption of ASU 2017-12, such amounts are no longer required to be immediately recognized in income, but instead the full change in the value of the hedging instrument is required to be recognized in AOCI, and then recognized in earnings in the same period that the cash flows impact earnings. The pretax change in AOCI from cash flow hedges is presented below:

	Year ended December 31,		
In millions of dollars	2018	2017	2016
Amount of gain (loss) recognized in AOCI on derivative			
Interest rate contracts[1]	$(361)	$(165)	$(219)
Foreign exchange contracts	5	(8)	69
Total gain (loss) recognized in AOCI	$(356)	$(173)	$(150)
Amount of gain (loss) reclassified from AOCI to earnings	Other revenue	Net interest revenue	Other revenue	Other revenue
Interest rate contracts[1]	$—	$(301)	$(126)	$(140)
Foreign exchange contracts	(17)	—	(10)	(93)
Total gain (loss) reclassified from AOCI into earnings	$(17)	$(301)	$(136)	$(233)

(1) After January 1, 2018, all amounts reclassified into earnings for interest rate contracts are included in Interest income/Interest expense (Net interest revenue). For all other hedges, including interest rate hedges prior to January 1, 2018, the amounts reclassified to earnings are included primarily in Other revenue and Net interest revenue in the Consolidated Statement of Income.

For cash flow hedges, the changes in the fair value of the hedging derivative remain in AOCI on the Consolidated Balance Sheet and will be included in the earnings of future periods to offset the variability of the hedged cash flows when such cash flows affect earnings. The net gain (loss) associated with cash flow hedges expected to be reclassified from AOCI within 12 months of December 31, 2018 is approximately $404 million. The maximum length of time over which forecasted cash flows are hedged is 10 years.

The after-tax impact of cash flow hedges on AOCI is shown in Note 19 to the Consolidated Financial Statements.

Net Investment Hedges

Consistent with ASC 830-20, Foreign Currency Matters—Foreign Currency Transactions, ASC 815 allows the hedging of the foreign currency risk of a net investment in a foreign operation. Citigroup uses foreign currency forwards, cross-currency swaps, options and foreign currency-denominated debt instruments to manage the foreign exchange risk associated with Citigroup's equity investments in several non-U.S.-dollar-functional-currency foreign subsidiaries. Citigroup records the change in the carrying amount of these investments in the Foreign currency translation adjustment account within AOCI. Simultaneously, the effective portion of the hedge of this exposure is also recorded in the Foreign currency translation adjustment account and any ineffective portion is immediately recorded in earnings.

For derivatives designated as net investment hedges, Citigroup follows the forward-rate method outlined in ASC 815-35-35. According to that method, all changes in fair value, including changes related to the forward-rate component of the foreign currency forward contracts and the time value of foreign currency options, are recorded in the Foreign currency translation adjustment account within AOCI.

For foreign currency-denominated debt instruments that are designated as hedges of net investments, the translation gain or loss that is recorded in the Foreign currency translation adjustment account is based on the spot exchange rate between the functional currency of the respective subsidiary and the U.S. dollar, which is the functional currency of Citigroup. To the extent that the notional amount of the hedging instrument exactly matches the hedged net investment, and the underlying exchange rate of the derivative hedging instrument relates to the exchange rate between the functional currency of the net investment and Citigroup's functional currency (or, in the case of a non-derivative debt instrument, such instrument is denominated in the functional currency of the net investment), no ineffectiveness is recorded in earnings.

The pretax gain (loss) recorded in the Foreign currency translation adjustment account within AOCI, related to net investment hedges, is $1,207 million, $2,528 million and $(220) million for the years ended December 31, 2018, 2017 and 2016, respectively.

Economic Hedges

Citigroup often uses economic hedges when hedge accounting would be too complex or operationally burdensome. End-user derivatives that are economic hedges are carried at fair value, with changes in value included in either Principal transactions or Other revenue.

For asset/liability management hedging, fixed-rate long-term debt is recorded at amortized cost under GAAP.

For other hedges that either do not meet the ASC 815 hedging criteria or for which management decides not to apply ASC 815 hedge accounting, the derivative is recorded at fair value on the balance sheet with the associated changes in fair value recorded in earnings, while the debt continues to be carried at amortized cost. Therefore, current earnings are affected by the interest rate shifts and other factors that cause a

change in the swap's value, but for which no offsetting change in value is recorded on the debt.

Citigroup may alternatively elect to account for the debt at fair value under the fair value option. Once the irrevocable election is made upon issuance of the debt, the full change in fair value of the debt is reported in earnings. The changes in fair value of the related interest rate swap are also reflected in earnings, which provides a natural offset to the debt's fair value change. To the extent that the two amounts differ because the full change in the fair value of the debt includes risks not offset by the interest rate swap, the difference is automatically captured in current earnings.

Additional economic hedges include hedges of the credit risk component of commercial loans and loan commitments. Citigroup periodically evaluates its hedging strategies in other areas and may designate either an accounting hedge or an economic hedge after considering the relative costs and benefits. Economic hedges are also employed when the hedged item itself is marked to market through current earnings, such as hedges of commitments to originate one- to four-family mortgage loans to be HFS and MSRs.

Credit Derivatives

Citi is a market maker and trades a range of credit derivatives. Through these contracts, Citi either purchases or writes protection on either a single name or a portfolio of reference credits. Citi also uses credit derivatives to help mitigate

credit risk in its corporate and consumer loan portfolios and other cash positions and to facilitate client transactions. Citi monitors its counterparty credit risk in credit derivative contracts. As of both December 31, 2018 and 2017, approximately 98% of the gross receivables are from counterparties with which Citi maintains collateral agreements. A majority of Citi's top 15 counterparties (by receivable balance owed to Citi) are banks, financial institutions or other dealers. Contracts with these counterparties do not include ratings-based termination events. However, counterparty ratings downgrades may have an incremental effect by lowering the threshold at which Citi may call for additional collateral.

The range of credit derivatives entered into includes credit default swaps, total return swaps, credit options and credit-linked notes.

A credit default swap is a contract in which, for a fee, a protection seller agrees to reimburse a protection buyer for any losses that occur due to a predefined credit event on a reference entity. These credit events are defined by the terms of the derivative contract and the reference credit and are generally limited to the market standard of failure to pay on indebtedness and bankruptcy of the reference credit and, in a more limited range of transactions, debt restructuring. Credit derivative transactions that reference emerging market entities also typically include additional credit events to cover the acceleration of indebtedness and the risk of repudiation or a payment moratorium. In certain transactions, protection may be provided on a portfolio of reference entities or asset-backed securities. If there is no credit event, as defined by the specific derivative contract, then the protection seller makes no payments to the protection buyer and receives only the

contractually specified fee. However, if a credit event occurs as defined in the specific derivative contract sold, the protection seller will be required to make a payment to the protection buyer. Under certain contracts, the seller of protection may not be required to make a payment until a specified amount of losses has occurred with respect to the portfolio and/or may only be required to pay for losses up to a specified amount.

A total return swap typically transfers the total economic performance of a reference asset, which includes all associated cash flows, as well as capital appreciation or depreciation. The protection buyer receives a floating rate of interest and any depreciation on the reference asset from the protection seller and, in return, the protection seller receives the cash flows associated with the reference asset plus any appreciation. Thus, according to the total return swap agreement, the protection seller will be obligated to make a payment any time the floating interest rate payment plus any depreciation of the reference asset exceeds the cash flows associated with the underlying asset. A total return swap may terminate upon a default of the reference asset or a credit event with respect to the reference entity, subject to the provisions of the related total return swap agreement between the protection seller and the protection buyer.

A credit option is a credit derivative that allows investors to trade or hedge changes in the credit quality of a reference entity. For example, in a credit spread option, the option writer assumes the obligation to purchase or sell credit protection on the reference entity at a specified “strike” spread level. The option purchaser buys the right to sell credit default protection on the reference entity to, or purchase it from, the option writer at the strike spread level. The payments on credit spread options depend either on a particular credit spread or the price of the underlying credit-sensitive asset or other reference entity. The options usually terminate if a credit event occurs with respect to the underlying reference entity.

A credit-linked note is a form of credit derivative structured as a debt security with an embedded credit default swap. The purchaser of the note effectively provides credit protection to the issuer by agreeing to receive a return that could be negatively affected by credit events on the underlying reference credit. If the reference entity defaults, the note may be cash settled or physically settled by delivery of a debt security of the reference entity. Thus, the maximum amount of the note purchaser’s exposure is the amount paid for the credit-linked note.

The following tables summarize the key characteristics of Citi's credit derivatives portfolio by counterparty and derivative form:

	Fair values		Notionals	
In millions of dollars at December 31, 2018	Receivable[1]	Payable[2]	Protection purchased	Protection sold
By industry/counterparty				
Banks	$4,785	$ 4,432	$214,842	$218,273
Broker-dealers	1,706	1,612	62,904	63,014
Non-financial	64	87	2,687	1,192
Insurance and other financial institutions	4,210	4,220	515,216	442,460
Total by industry/counterparty	$10,765	$ 10,351	$795,649	$724,939
By instrument				
Credit default swaps and options	$10,030	$ 9,755	$771,865	$712,623
Total return swaps and other	735	596	23,784	12,316
Total by instrument	$10,765	$ 10,351	$795,649	$724,939
By rating				
Investment grade	$4,725	$ 4,544	$637,790	$568,849
Non-investment grade	6,040	5,807	157,859	156,090
Total by rating	$10,765	$ 10,351	$795,649	$724,939
By maturity				
Within 1 year	$2,037	$ 2,063	$251,994	$225,597
From 1 to 5 years	6,720	6,414	493,096	456,409
After 5 years	2,008	1,874	50,559	42,933
Total by maturity	$10,765	$ 10,351	$795,649	$724,939

(1) The fair value amount receivable is composed of $5,126 million under protection purchased and $5,639 million under protection sold.

(2) The fair value amount payable is composed of $5,882 million under protection purchased and $4,469 million under protection sold.

	Fair values		Notionals	
In millions of dollars at December 31, 2017	Receivable[1]	Payable[2]	Protection purchased	Protection sold
By industry/counterparty				
Banks	$7,471	$ 6,669	$264,414	$273,711
Broker-dealers	2,325	2,285	73,273	83,229
Non-financial	70	91	1,288	1,140
Insurance and other financial institutions	10,668	12,488	438,738	377,062
Total by industry/counterparty	$20,534	$ 21,533	$777,713	$735,142
By instrument				
Credit default swaps and options	$20,251	$ 20,554	$754,114	$724,228
Total return swaps and other	283	979	23,599	10,914
Total by instrument	$20,534	$ 21,533	$777,713	$735,142
By rating				
Investment grade	$10,473	$ 10,616	$588,324	$557,987
Non-investment grade	10,061	10,917	189,389	177,155
Total by rating	$20,534	$ 21,533	$777,713	$735,142
By maturity				
Within 1 year	$2,477	$ 2,914	$231,878	$218,097
From 1 to 5 years	16,098	16,435	498,606	476,345

After 5 years	1,959	2,184	47,229	40,700
Total by maturity	$20,534	$21,533	$777,713	$735,142

(1) The fair value amount receivable is composed of $3,195 million under protection purchased and $17,339 million under protection sold.

(2) The fair value amount payable is composed of $3,147 million under protection purchased and $18,386 million under protection sold.

Fair values included in the above tables are prior to application of any netting agreements and cash collateral. For notional amounts, Citi generally has a mismatch between the total notional amounts of protection purchased and sold, and it may hold the reference assets directly rather than entering into offsetting credit derivative contracts as and when desired. The open risk exposures from credit derivative contracts are largely matched after certain cash positions in reference assets are considered and after notional amounts are adjusted, either to a duration-based equivalent basis or to reflect the level of subordination in tranched structures. The ratings of the credit derivatives portfolio presented in the tables and used to evaluate payment/performance risk are based on the assigned internal or external ratings of the reference asset or entity. Where external ratings are used, investment-grade ratings are considered to be “Baa/BBB” and above, while anything below is considered non-investment grade. Citi’s internal ratings are in line with the related external rating system.

Citigroup evaluates the payment/performance risk of the credit derivatives for which it stands as a protection seller based on the credit rating assigned to the underlying reference credit. Credit derivatives written on an underlying non-investment grade reference credit represent greater payment risk to the Company. The non-investment grade category in the table above also includes credit derivatives where the underlying reference entity has been downgraded subsequent to the inception of the derivative.

The maximum potential amount of future payments under credit derivative contracts presented in the table above is based on the notional value of the derivatives. The Company believes that the notional amount for credit protection sold is not representative of the actual loss exposure based on historical experience. This amount has not been reduced by the value of the reference assets and the related cash flows. In accordance with most credit derivative contracts, should a credit event occur, the Company usually is liable for the difference between the protection sold and the value of the reference assets. Furthermore, the notional amount for credit protection sold has not been reduced for any cash collateral paid to a given counterparty, as such payments would be calculated after netting all derivative exposures, including any credit derivatives with that counterparty in accordance with a related master netting agreement. Due to such netting processes, determining the amount of collateral that corresponds to credit derivative exposures alone is not possible. The Company actively monitors open credit-risk exposures and manages this exposure by using a variety of strategies, including purchased credit derivatives, cash collateral or direct holdings of the referenced assets. This risk mitigation activity is not captured in the table above.

Credit Risk-Related Contingent Features in Derivatives

Certain derivative instruments contain provisions that require the Company to either post additional collateral or immediately settle any outstanding liability balances upon the occurrence of a specified event related to the credit risk of the Company. These events, which are defined by the existing derivative contracts, are primarily downgrades in the credit ratings of the Company and its affiliates.

The fair value (excluding CVA) of all derivative instruments with credit-risk-related contingent features that were in a net liability position at both December 31, 2018 and 2017 was $33 billion and $29 billion, respectively. The Company posted $33 billion and $28 billion as collateral for this exposure in the normal course of business as of December 31, 2018 and 2017, respectively.

A downgrade could trigger additional collateral or cash settlement requirements for the Company and certain affiliates. In the event that Citigroup and Citibank were downgraded a single notch by all three major rating agencies as of December 31, 2018, the Company could be required to post an additional $0.6 billion as either collateral or settlement of the derivative transactions. Additionally, the Company could be required to segregate with third-party custodians collateral previously received from existing derivative counterparties in the amount of $0.1 billion upon the single notch downgrade, resulting in aggregate cash obligations and collateral requirements of approximately $0.7 billion.

Derivatives Accompanied by Financial Asset Transfers

The Company executes total return swaps that provide it with synthetic exposure to substantially all of the economic return of the securities or other financial assets referenced in the contract. In certain cases, the derivative transaction is accompanied by the Company’s transfer of the referenced financial asset to the derivative counterparty, most typically

in response to the derivative counterparty's desire to hedge, in whole or in part, its synthetic exposure under the derivative contract by holding the referenced asset in funded form. In certain jurisdictions these transactions qualify as sales, resulting in derecognition of the securities transferred (see Note 1 to the Consolidated Financial Statements for further discussion of the related sale conditions for transfers of financial assets). For a significant portion of the transactions, the Company has also executed another total return swap where the Company passes on substantially all of the economic return of the referenced securities to a different third party seeking the exposure. In those cases, the Company is not exposed, on a net basis, to changes in the economic return of the referenced securities.

These transactions generally involve the transfer of the Company's liquid government bonds, convertible bonds or publicly traded corporate equity securities from the trading portfolio and are executed with third-party financial institutions. The accompanying derivatives are typically total return swaps. The derivatives are cash settled and subject to ongoing margin requirements.

When the conditions for sale accounting are met, the Company reports the transfer of the referenced financial asset as a sale and separately reports the accompanying derivative

transaction. These transactions generally do not result in a gain or loss on the sale of the security, because the transferred security was held at fair value in the Company's trading portfolio. For transfers of financial assets accounted for as a sale by the Company, and for which the Company has retained substantially all of the economic exposure to the transferred asset through a total return swap executed with the same counterparty in contemplation of the initial sale and still outstanding, both the asset amounts derecognized and gross cash proceeds received as of the date of derecognition were $4.1 billion and $3.0 billion as of December 31, 2018 and 2017, respectively.

At December 31, 2018, the fair value of these previously derecognized assets was $4.1 billion. The fair value of the total return swaps as of December 31, 2018 was $55 million recorded as gross derivative assets and $9 million recorded as gross derivative liabilities. At December 31, 2017, the fair value of these previously derecognized assets was $3.1 billion, and the fair value of the total return swaps was $89 million recorded as gross derivative assets and $15 million recorded as gross derivative liabilities.

The balances for the total return swaps are on a gross basis, before the application of counterparty and cash collateral netting, and are included primarily as equity derivatives in the tabular disclosures in this Note.

23. CONCENTRATIONS OF CREDIT RISK

Concentrations of credit risk exist when changes in economic, industry or geographic factors similarly affect groups of counterparties whose aggregate credit exposure is material in relation to Citigroup's total credit exposure. Although Citigroup's portfolio of financial instruments is broadly diversified along industry, product and geographic lines, material transactions are completed with other financial institutions, particularly in the securities trading, derivatives and foreign exchange businesses.

In connection with the Company's efforts to maintain a diversified portfolio, the Company limits its exposure to any one geographic region, country or individual creditor and monitors this exposure on a continuous basis. At December 31, 2018, Citigroup's most significant concentration of credit risk was with the U.S. government and its agencies. The Company's exposure, which primarily results from trading assets and investments issued by the U.S. government and its agencies, amounted to $250.0 billion and $227.8 billion at December 31, 2018 and 2017, respectively. The German and Japanese governments and their agencies, which are rated investment grade by both Moody's and S&P, were the next largest exposures. The Company's exposure to Germany amounted to $46.4 billion and $38.3 billion at December 31, 2018 and 2017, respectively, and was composed of investment securities, loans and trading assets. The Company's exposure to Japan amounted to $28.8 billion and $25.8 billion at December 31, 2018 and 2017, respectively, and was composed of investment securities, loans and trading assets.

The Company's exposure to states and municipalities amounted to $27.9 billion and $30.6 billion at December 31, 2018 and 2017, respectively, and was composed of trading assets, investment securities, derivatives and lending activities.

24. FAIR VALUE MEASUREMENT

ASC 820-10, Fair Value Measurement, defines fair value, establishes a consistent framework for measuring fair value and requires disclosures about fair value measurements. 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, and therefore represents an exit price. Among other things, the standard requires the Company to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

Under ASC 820-10, the probability of default of a counterparty is factored into the valuation of derivative and other positions as well as the impact of Citigroup's own credit risk on derivatives and other liabilities measured at fair value.

Fair Value Hierarchy

ASC 820-10 specifies a hierarchy of inputs based on whether the inputs are observable or unobservable. Observable inputs are developed using market data and reflect market participant assumptions, while unobservable inputs reflect the Company's market assumptions. These two types of inputs have created the following fair value hierarchy:

- Level 1: Quoted prices for identical instruments in active markets.
- Level 2: Quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active and model-derived valuations in which all significant inputs and significant value drivers are observable in active markets.
- Level 3: Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

As required under the fair value hierarchy, the Company considers relevant and observable market inputs in its valuations where possible. The frequency of transactions, the size of the bid-ask spread and the amount of adjustment necessary when comparing similar transactions are all factors in determining the relevance of observed prices in those markets.

Determination of Fair Value

For assets and liabilities carried at fair value, the Company measures fair value using the procedures set out below, irrespective of whether the assets and liabilities are measured at fair value as a result of an election or whether they are required to be measured at fair value.

When available, the Company uses quoted market prices to determine fair value and classifies such items as Level 1. In some specific cases where a market price is available, the Company will make use of acceptable practical expedients (such as matrix pricing) to calculate fair value, in which case the items are classified as Level 2.

The Company may also apply a price-based methodology, which utilizes, where available, quoted prices or other market information obtained from recent trading activity in positions with the same or similar characteristics to the position being valued. The frequency and size of transactions are among the factors that are driven by the liquidity of markets and determine the relevance of observed prices in those markets. If relevant and observable prices are available, those valuations may be classified as Level 2. When that is not the case, and there are one or more significant unobservable "price" inputs, then those valuations will be classified as Level 3. Furthermore, when less liquidity exists for a security or loan, a quoted price is stale, a significant adjustment to the price of a similar security is necessary to reflect differences in the terms of the actual security or loan being valued, or prices from independent sources are insufficient to corroborate the valuation, the "price" inputs are considered unobservable and the fair value measurements are classified as Level 3.

If quoted market prices are not available, fair value is based upon internally developed valuation techniques that use, where possible, current market-based parameters, such as interest rates, currency rates and option volatilities. Items valued using such internally generated valuation techniques are classified according to the lowest level input or value driver that is significant to the valuation. Thus, an item may be classified as Level 3 even though there may be some significant inputs that are readily observable.

Fair value estimates from internal valuation techniques are verified, where possible, to prices obtained from independent vendors or brokers. Vendors' and brokers' valuations may be based on a variety of inputs ranging from observed prices to proprietary valuation models, and the Company assesses the quality and relevance of this information in determining the estimate of fair value. The following section describes the valuation methodologies used by the Company to measure various financial instruments at fair value, including an indication of the level in the fair value hierarchy in which each instrument is generally classified. Where appropriate, the description includes details of the valuation models, the key inputs to those models and any significant assumptions.

Market Valuation Adjustments

Generally, the unit of account for a financial instrument is the individual financial instrument. The Company applies market valuation adjustments that are consistent with the unit of account, which does not include adjustment due to the size of the Company's position, except as follows. ASC 820-10 permits an exception, through an accounting policy election, to measure the fair value of a portfolio of financial assets and financial liabilities on the basis of the net open risk position when certain criteria are met. Citi has elected to measure certain portfolios of financial instruments that meet those criteria, such as derivatives, on the basis of the net open risk position. The Company applies market valuation adjustments, including adjustments to account for the size of the net open risk position, consistent with market participant assumptions.

Valuation adjustments are applied to items classified as Level 2 or Level 3 in the fair value hierarchy to ensure that the fair value reflects the price at which the net open risk position could be exited. These valuation adjustments are based on the bid/offer spread for an instrument in the market. When Citi has elected to measure certain portfolios of financial investments, such as derivatives, on the basis of the net open risk position, the valuation adjustment may take into account the size of the position.

Credit valuation adjustments (CVA) and funding valuation adjustments (FVA) are applied to the relevant population of over-the-counter (OTC) derivative instruments where adjustments to reflect counterparty credit risk, own credit risk and term funding risk are required to estimate fair value. This principally includes derivatives with a base valuation (e.g., discounted using overnight indexed swap (OIS)) requiring adjustment for these effects, such as uncollateralized interest rate swaps. The CVA represents a portfolio-level adjustment to reflect the risk premium associated with the counterparty's (assets) or Citi's (liabilities) non-performance risk.

FVA reflect a market funding risk premium inherent in the uncollateralized portion of a derivative portfolio and in certain collateralized derivative portfolios that do not include standard credit support annexes (CSAs), such as where the CSA does not permit the reuse of collateral received. Citi's FVA methodology leverages the existing CVA methodology to estimate a funding exposure profile. The calculation of this exposure profile considers collateral agreements in which the terms do not permit the Company to reuse the collateral received, including where counterparties post collateral to third-party custodians.

Citi's CVA and FVA methodology consists of two steps:

- First, the exposure profile for each counterparty is determined using the terms of all individual derivative positions and a Monte Carlo simulation or other quantitative analysis to generate a series of expected cash flows at future points in time. The calculation of this exposure profile considers the effect of credit risk mitigants and sources of funding, including pledged cash or other collateral and any legal right of offset that exists with a counterparty through arrangements such as netting agreements. Individual derivative contracts that are subject to an enforceable master netting agreement with a counterparty are aggregated as a netting set for this purpose, since it is those aggregate net cash flows that are subject to nonperformance risk. This process identifies specific, point-in-time future cash flows that are subject to nonperformance risk and unsecured funding, rather than using the current recognized net asset or liability as a basis to measure the CVA and FVA.
- Second, for CVA, market-based views of default probabilities derived from observed credit spreads in the credit default swap (CDS) market are applied to the expected future cash flows determined in step one. Citi's own-credit CVA is determined using Citi-specific CDS spreads for the relevant tenor. Generally, counterparty

CVA is determined using CDS spread indices for each credit rating and tenor. For certain identified netting sets where individual analysis is practicable (e.g., exposures to counterparties with liquid CDSs), counterparty-specific CDS spreads are used. For FVA, a term structure of future liquidity spreads is applied to the expected future funding requirement.

The CVA and FVA are designed to incorporate a market view of the credit and funding risk, respectively, inherent in the derivative portfolio. However, most unsecured derivative instruments are negotiated bilateral contracts and are not commonly transferred to third parties. Derivative instruments are normally settled contractually or, if terminated early, are terminated at a value negotiated bilaterally between the counterparties. Thus, the CVA and FVA may not be realized upon a settlement or termination in the normal course of business. In addition, all or a portion of these adjustments may be reversed or otherwise adjusted in future periods in the event of changes in the credit or funding risk associated with the derivative instruments.

The table below summarizes the CVA and FVA applied to the fair value of derivative instruments at December 31, 2018 and 2017:

	Credit and funding valuation adjustments contra-liability (contra-asset)

In millions of dollars	December 31, 2018	December 31, 2017
Counterparty CVA	$(1,085)	$ (970)
Asset FVA	(544)	(447)
Citigroup (own-credit) CVA	482	287
Liability FVA	135	47
Total CVA—derivative instruments[1]	$(1,012)	$ (1,083)

(1) FVA is included with CVA for presentation purposes.

The table below summarizes pretax gains (losses) related to changes in CVA on derivative instruments, net of hedges, FVA on derivatives and debt valuation adjustments (DVA) on Citi's own fair value option (FVO) liabilities for the years indicated:

	Credit/funding/debt valuation adjustments gain (loss)		
In millions of dollars	2018	2017	2016
Counterparty CVA	$(109)	$276	$157
Asset FVA	46	90	47
Own-credit CVA	178	(153)	17
Liability FVA	56	(15)	(44)
Total CVA—derivative instruments	$171	$198	$177
DVA related to own FVO liabilities[1]	$1,415	$(680)	$(538)
Total CVA and DVA[2]	$1,586	$(482)	$(361)

(1) See Notes 1 and 17 to the Consolidated Financial Statements.

(2)FVA is included with CVA for presentation purposes.

Securities Purchased Under Agreements to Resell and Securities Sold Under Agreements to Repurchase
No quoted prices exist for these instruments, so fair value is determined using a discounted cash flow technique. Cash flows are estimated based on the terms of the contract, taking into account any embedded derivative or other features. These cash flows are discounted using interest rates appropriate to the maturity of the instrument as well as the nature of the underlying collateral. Generally, when such instruments are recorded at fair value, they are classified within Level 2 of the fair value hierarchy, as the inputs used in the valuation are readily observable. However, certain long-dated positions are classified within Level 3 of the fair value hierarchy.

Trading Account Assets and Liabilities—Trading Securities and Trading Loans
When available, the Company uses quoted market prices in active markets to determine the fair value of trading securities; such items are classified as Level 1 of the fair value hierarchy. Examples include government securities and exchange-traded equity securities.
For bonds and secondary market loans traded over the counter, the Company generally determines fair value utilizing valuation techniques, including discounted cash flows, price-based and internal models. Fair value estimates from these internal valuation techniques are verified, where possible, to prices obtained from independent sources, including third-party vendors. Vendors compile prices from various sources and may apply matrix pricing for similar bonds or loans where no price is observable. A price-based methodology utilizes, where available, quoted prices or other market information obtained from recent trading activity of assets with similar characteristics to the bond or loan being valued. The yields used in discounted cash flow models are derived from the same price information. Trading securities and loans priced using such methods are generally classified as Level 2. However, when less liquidity exists for a security or loan, a quoted price is stale, a significant adjustment to the price of a similar security or loan is necessary to reflect differences in the terms of the actual security or loan being valued, or prices from independent sources are insufficient to corroborate valuation, a loan or security is generally classified as Level 3. The price input used in a price-based methodology may be zero for a security, such as a subprime CDO, that is not receiving any principal or interest and is currently written down to zero.
When the Company’s principal market for a portfolio of loans is the securitization market, the Company uses the securitization price to determine the fair value of the portfolio. The securitization price is determined from the assumed proceeds of a hypothetical securitization in the current market, adjusted for transformation costs (i.e., direct costs other than transaction costs) and securitization uncertainties such as market conditions and liquidity. As a result of the severe reduction in the level of activity in certain securitization markets since the second half of 2007,

observable securitization prices for certain directly comparable portfolios of loans have not been readily available. Therefore, such portfolios of loans are generally classified as Level 3 of the fair value hierarchy. However, for other loan securitization markets, such as commercial real estate loans, price verification of the hypothetical securitizations has been possible, since these markets have remained active. Accordingly, this loan portfolio is classified as Level 2 of the fair value hierarchy.
For most of the lending and structured direct subprime exposures, fair value is determined utilizing observable transactions where available, other market data for similar assets in markets that are not active and other internal valuation techniques. The valuation of certain asset-backed security (ABS) CDO positions utilizes prices based on the underlying assets of the ABS CDO.

Trading Account Assets and Liabilities—Derivatives
Exchange-traded derivatives, measured at fair value using quoted (i.e., exchange) prices in active markets, where available, are classified as Level 1 of the fair value hierarchy.
Derivatives without a quoted price in an active market and derivatives executed over the counter are valued using internal valuation techniques. These derivative instruments are classified as either Level 2 or Level 3 depending on the observability of the significant inputs to the model.

The valuation techniques depend on the type of derivative and the nature of the underlying instrument. The principal techniques used to value these instruments are discounted cash flows and internal models, such as derivative pricing models (e.g., Black-Scholes and Monte Carlo simulations).

The key inputs depend upon the type of derivative and the nature of the underlying instrument and include interest rate yield curves, foreign exchange rates, volatilities and correlation. The Company typically uses OIS curves as fair value measurement inputs for the valuation of certain derivatives.

Investments

The investments category includes available-for-sale debt and marketable equity securities whose fair values are generally determined by utilizing similar procedures described for trading securities above or, in some cases, using vendor pricing as the primary source.

Also included in investments are nonpublic investments in private equity and real estate entities. Determining the fair value of nonpublic securities involves a significant degree of management judgment, as no quoted prices exist and such securities are generally thinly traded. In addition, there may be transfer restrictions on private equity securities. The Company's process for determining the fair value of such securities utilizes commonly accepted valuation techniques, including comparables analysis. In determining the fair value of nonpublic securities, the Company also considers events such as a proposed sale of the investee company, initial public offerings, equity issuances or other observable transactions. Private equity securities are generally classified as Level 3 of the fair value hierarchy.

In addition, the Company holds investments in certain alternative investment funds that calculate NAV per share, including hedge funds, private equity funds and real estate funds. Investments in funds are generally classified as non-marketable equity securities carried at fair value. The fair values of these investments are estimated using the NAV per share of the Company's ownership interest in the funds where it is not probable that the investment will be realized at a price other than the NAV. Consistent with the provisions of ASU 2015-07, these investments have not been categorized within the fair value hierarchy and are not included in the tables below. See Note 13 to the Consolidated Financial Statements for additional information.

Short-Term Borrowings and Long-Term Debt

Where fair value accounting has been elected, the fair value of non-structured liabilities is determined by utilizing internal models using the appropriate discount rate for the applicable maturity. Such instruments are generally classified as Level 2 of the fair value hierarchy when all significant inputs are readily observable.

The Company determines the fair value of hybrid financial instruments, including structured liabilities, using the appropriate derivative valuation methodology (described above in "Trading Account Assets and Liabilities—Derivatives") given the nature of the embedded risk profile. Such instruments are classified as Level 2 or Level 3 depending on the observability of significant inputs to the model.

Items Measured at Fair Value on a Recurring Basis

The following tables present for each of the fair value hierarchy levels the Company's assets and liabilities that are measured at fair value on a recurring basis at December 31, 2018 and 2017. The Company may hedge positions that have been classified in the Level 3 category with other financial

instruments (hedging instruments) that may be classified as Level 3, but also with financial instruments classified as Level 1 or Level 2 of the fair value hierarchy. The effects of these hedges are presented gross in the following tables:

Fair Value Levels

In millions of dollars at December 31, 2018	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Assets						
Federal funds sold and securities borrowed and purchased under agreements to resell	$—	$214,570	$115	$214,685	$(66,984)	$147,701
Trading non-derivative assets						
Trading mortgage-backed securities						
U.S. government-sponsored agency guaranteed	—	24,090	156	24,246	—	24,246
Residential	—	709	268	977	—	977
Commercial	—	1,323	77	1,400	—	1,400
Total trading mortgage-backed securities	$—	$26,122	$501	$26,623	$—	$26,623
U.S. Treasury and federal agency securities	$26,439	$4,802	$1	$31,242	$—	$31,242
State and municipal	—	3,782	200	3,982	—	3,982
Foreign government	43,309	21,179	31	64,519	—	64,519
Corporate	1,026	14,510	360	15,896	—	15,896
Equity securities	36,342	7,308	153	43,803	—	43,803
Asset-backed securities	—	1,429	1,484	2,913	—	2,913
Other trading assets[2]	3	12,198	818	13,019	—	13,019
Total trading non-derivative assets	$107,119	$91,330	$3,548	$201,997	$—	$201,997
Trading derivatives						
Interest rate contracts	$101	$169,860	$1,671	$171,632		
Foreign exchange contracts	—	162,108	346	162,454		
Equity contracts	647	28,903	343	29,893		
Commodity contracts	—	16,788	767	17,555		
Credit derivatives	—	9,839	926	10,765		
Total trading derivatives	$748	$387,498	$4,053	$392,299		
Cash collateral paid[3]				$11,518		
Netting agreements					$(311,089)	
Netting of cash collateral received					(38,608)	
Total trading derivatives	$748	$387,498	$4,053	$403,817	$(349,697)	$54,120
Investments						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$—	$42,988	$32	$43,020	$—	$43,020
Residential	—	1,313	—	1,313	—	1,313
Commercial	—	172	—	172	—	172
Total investment mortgage-backed securities	$—	$44,473	$32	$44,505	$—	$44,505
U.S. Treasury and federal agency securities	$107,577	$9,645	$—	$117,222	$—	$117,222
State and municipal	—	8,498	708	9,206	—	9,206
Foreign government	58,252	42,371	68	100,691	—	100,691
Corporate	4,410	7,033	156	11,599	—	11,599
Marketable equity securities	206	14	—	220	—	220

Asset-backed securities	—	656	187	843	—	843
Other debt securities	—	3,972	—	3,972	—	3,972
Non-marketable equity securities[4]	—	96	586	682	—	682
Total investments	$170,445	$116,758	$1,737	$288,940	$—	$288,940

Table continues on the next page, including footnotes.

In millions of dollars at December 31, 2018	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Loans	$—	$2,946	$277	$3,223	$—	$3,223
Mortgage servicing rights	—	—	584	584	—	584
Non-trading derivatives and other financial assets measured on a recurring basis	$15,839	$4,949	$—	$20,788	$—	$20,788
Total assets	$294,151	$818,051	$10,314	$1,134,034	$(416,681)	$717,353
Total as a percentage of gross assets[5]	26.2 %	72.9 %	0.9 %			
Liabilities						
Interest-bearing deposits	$—	$980	$495	$1,475	$—	$1,475
Federal funds purchased and securities loaned and sold under agreements to repurchase	—	110,511	983	111,494	(66,984)	44,510
Trading account liabilities						
Securities sold, not yet purchased	78,872	11,364	586	90,822	—	90,822
Other trading liabilities	—	1,547	—	1,547	—	1,547
Total trading liabilities	$78,872	$12,911	$586	$92,369	$—	$92,369
Trading derivatives						
Interest rate contracts	$71	$152,931	$1,825	$154,827		
Foreign exchange contracts	—	159,003	352	159,355		
Equity contracts	351	32,330	1,127	33,808		
Commodity contracts	—	19,904	785	20,689		
Credit derivatives	—	9,486	865	10,351		
Total trading derivatives	$422	$373,654	$4,954	$379,030		
Cash collateral received[6]				$13,906		
Netting agreements					$(311,089)	
Netting of cash collateral paid					(29,911)	
Total trading derivatives	$422	$373,654	$4,954	$392,936	$(341,000)	$51,936
Short-term borrowings	$—	$4,446	$37	$4,483	$—	$4,483
Long-term debt	—	25,659	12,570	38,229	—	38,229
Total non-trading derivatives and other financial liabilities measured on a recurring basis	$15,839	$67	$—	$15,906	$—	$15,906
Total liabilities	$95,133	$528,228	$19,625	$656,892	$(407,984)	$248,908
Total as a percentage of gross liabilities[5]	14.8 %	82.1 %	3.1 %			

(1) Represents netting of (i) the amounts due under securities purchased under agreements to resell and the amounts owed under securities sold under agreements to repurchase and (ii) derivative exposures covered by a qualifying master netting agreement and cash collateral offsetting.

(2) Includes positions related to investments in unallocated precious metals, as discussed in Note 25 to the Consolidated Financial Statements. Also includes physical commodities accounted for at the lower of cost or fair value and unfunded credit products.

(3) Reflects the net amount of $41,429 million of gross cash collateral paid, of which $29,911 million was used to offset trading derivative liabilities.

(4) Amounts exclude $0.2 billion of investments measured at NAV in accordance with ASU No. 2015-07, Fair Value Measurement (Topic 820): Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or Its Equivalent).

(5) Because the amount of the cash collateral paid/received has not been allocated to the Level 1, 2 and 3 subtotals, these percentages are calculated based on total assets and liabilities measured at fair value on a recurring basis, excluding the cash collateral paid/received on derivatives.

(6) Reflects the net amount of $52,514 million of gross cash collateral received, of which $38,608 million was used to offset trading derivative assets.

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Fair Value Levels						
In millions of dollars at December 31, 2017	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Assets						
Federal funds sold and securities borrowed and purchased under agreements to resell	$—	$188,571	$16	$188,587	$(55,638)	$132,949
Trading non-derivative assets						
Trading mortgage-backed securities						
U.S. government-sponsored agency guaranteed	—	22,801	163	22,964	—	22,964
Residential	—	649	164	813	—	813
Commercial	—	1,309	57	1,366	—	1,366
Total trading mortgage-backed securities	$—	$24,759	$384	$25,143	$—	$25,143
U.S. Treasury and federal agency securities	$17,524	$3,613	$—	$21,137	$—	$21,137
State and municipal	—	4,426	274	4,700	—	4,700
Foreign government	39,347	20,843	16	60,206	—	60,206
Corporate	301	15,129	275	15,705	—	15,705
Equity securities	53,305	6,794	120	60,219	—	60,219
Asset-backed securities	—	1,198	1,590	2,788	—	2,788
Other trading assets[2]	3	11,105	615	11,723	—	11,723
Total trading non-derivative assets	$110,480	$87,867	$3,274	$201,621	$—	$201,621
Trading derivatives						
Interest rate contracts	$145	$203,134	$1,708	$204,987		
Foreign exchange contracts	19	121,363	577	121,959		
Equity contracts	2,364	24,170	444	26,978		
Commodity contracts	282	13,252	569	14,103		
Credit derivatives	—	19,624	910	20,534		
Total trading derivatives	$2,810	$381,543	$4,208	$388,561		
Cash collateral paid[3]				$7,541		
Netting agreements					$(306,401)	
Netting of cash collateral received					(38,532)	
Total trading derivatives	$2,810	$381,543	$4,208	$396,102	$(344,933)	$51,169
Investments						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$—	$41,717	$24	$41,741	$—	$41,741
Residential	—	2,884	—	2,884	—	2,884
Commercial	—	329	3	332	—	332
Total investment mortgage-backed securities	$—	$44,930	$27	$44,957	$—	$44,957
U.S. Treasury and federal agency securities	$106,964	$11,182	$—	$118,146	$—	$118,146
State and municipal	—	8,028	737	8,765	—	8,765
Foreign government	56,456	43,985	92	100,533	—	100,533
Corporate	1,911	12,127	71	14,109	—	14,109
Marketable equity securities	176	11	2	189	—	189
Asset-backed securities	—	3,091	827	3,918	—	3,918
Other debt securities	—	297	—	297	—	297
Non-marketable equity securities[4]	—	121	681	802	—	802
Total investments	$165,507	$123,772	$2,437	$291,716	$—	$291,716

In millions of dollars at December 31, 2017	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Loans	$—	$3,824	$550	$4,374	$—	$4,374
Mortgage servicing rights	—	—	558	558	—	558
Non-trading derivatives and other financial assets measured on a recurring basis	$13,903	$4,640	$16	$18,559	$—	$18,559
Total assets	$292,700	$790,217	$11,059	$1,101,517	$(400,571)	$700,946
Total as a percentage of gross assets[5]	26.8 %	72.2 %	1.0 %			
Liabilities						
Interest-bearing deposits	$—	$1,179	$286	$1,465	$—	$1,465
Federal funds purchased and securities loaned and sold under agreements to repurchase	—	95,550	726	96,276	(55,638)	40,638
Trading account liabilities						
Securities sold, not yet purchased	65,843	10,306	22	76,171	—	76,171
Other trading liabilities	—	1,409	5	1,414	—	1,414
Total trading liabilities	$65,843	$11,715	$27	$77,585	$—	$77,585
Trading account derivatives						
Interest rate contracts	$137	$182,372	$2,130	$184,639		
Foreign exchange contracts	9	120,316	447	120,772		
Equity contracts	2,430	26,472	2,471	31,373		
Commodity contracts	115	14,482	2,430	17,027		
Credit derivatives	—	19,824	1,709	21,533		
Total trading derivatives	$2,691	$363,466	$9,187	$375,344		
Cash collateral received[6]				$14,308		
Netting agreements					$(306,401)	
Netting of cash collateral paid					(35,666)	
Total trading derivatives	$2,691	$363,466	$9,187	$389,652	$(342,067)	$47,585
Short-term borrowings	$—	$4,609	$18	$4,627	$—	$4,627
Long-term debt	—	18,310	13,082	31,392	—	31,392
Non-trading derivatives and other financial liabilities measured on a recurring basis	$13,903	$50	$8	$13,961	$—	$13,961
Total liabilities	$82,437	$494,879	$23,334	$614,958	$(397,705)	$217,253
Total as a percentage of gross liabilities[5]	13.7 %	82.4 %	3.9 %			

(1) Represents netting of (i) the amounts due under securities purchased under agreements to resell and the amounts owed under securities sold under agreements to repurchase and (ii) derivative exposures covered by a qualifying master netting agreement and cash collateral offsetting.

(2) Includes positions related to investments in unallocated precious metals, as discussed in Note 25 to the Consolidated Financial Statements. Also includes physical commodities accounted for at the lower of cost or fair value and unfunded credit products.

(3) Reflects the net amount of $43,207 million of gross cash collateral paid, of which $35,666 million was used to offset trading derivative liabilities.

(4) Amounts exclude $0.4 billion of investments measured at NAV in accordance with ASU 2015-07.

(5) Because the amount of the cash collateral paid/received has not been allocated to the Level 1, 2 and 3 subtotals, these percentages are calculated based on total assets and liabilities measured at fair value on a recurring basis, excluding the cash collateral paid/received on derivatives.

(6) Reflects the net amount of $52,840 million of gross cash collateral received, of which $38,532 million was used to offset trading derivative assets.

Changes in Level 3 Fair Value Category

The following tables present the changes in the Level 3 fair value category for the years ended December 31, 2018 and 2017. The gains and losses presented below include changes in the fair value related to both observable and unobservable inputs.

The Company often hedges positions with offsetting positions that are classified in a different level. For example, the gains and losses for assets and liabilities in the Level 3

category presented in the tables below do not reflect the effect of offsetting losses and gains on hedging instruments that may be classified in the Level 1 and Level 2 categories. In addition, the Company hedges items classified in the Level 3 category with instruments also classified in Level 3 of the fair value hierarchy. The hedged items and related hedges are presented gross in the following tables:

Level 3 Fair Value Rollforward

In millions of dollars	Dec. 31, 2017	Net realized/unrealized gains (losses) included in Principal transactions	Other	Transfers into Level 3[1][2]	Transfers out of Level 3	Purchases	Issuances	Sales	Settlements	Dec. 31, 2018	Unrealized gains (losses) still held[3]
Assets											
Federal funds sold and securities borrowed and purchased under agreements to resell	$16	$ 17	$ —	$50	$—	$ 95	$ —	$16	$ (79)	$115	$ 9
Trading non-derivative assets											
Trading mortgage-backed securities											
U.S. government-sponsored agency guaranteed	163	5	—	92	(107)	281	—	(278)	—	156	186
Residential	164	112	—	124	(133)	154	—	(153)	—	268	4
Commercial	57	(7)	—	24	(49)	110	—	(58)	—	77	—
Total trading mortgage-backed securities	$384	$ 110	$ —	$240	$(289)	$ 545	$ —	$(489)	$ —	$501	$ 190
U.S. Treasury and federal agency securities	$—	$ —	$ —	$6	$(4)	$ 1	$ —	$—	$ (2)	$1	$ —
State and municipal	274	22	—	—	(96)	45	—	(45)	—	200	9
Foreign government	16	(2)	—	5	(13)	75	—	(50)	—	31	(28)
Corporate	275	(72)	—	138	(122)	596	(40)	(415)	—	360	(32)
Equity securities	120	2	—	25	(62)	290	—	(222)	—	153	(56)
Asset-backed securities	1,590	28	—	77	(90)	1,238	—	(1,359)	—	1,484	(21)
Other trading assets	615	276	—	197	(82)	598	8	(777)	(17)	818	91
Total trading non-derivative assets	$3,274	$ 364	$ —	$688	$(758)	$ 3,388	$ (32)	$(3,357)	$ (19)	$3,548	$ 153
Trading derivatives, net[4]											
Interest rate contracts	$(422)	$ 414	$ —	$(6)	$(193)	$ 8	$ 17	$(32)	$ 60	$(154)	$ 336
Foreign exchange contracts	130	(99)	—	(29)	77	11	—	(89)	(7)	(6)	(72)
Equity contracts	(2,027)	479	—	(131)	1,114	25	(44)	(17)	(183)	(784)	52
Commodity contracts	(1,861)	(505)	—	(32)	2,180	62	—	(19)	157	(18)	(171)
Credit derivatives	(799)	261	—	(7)	391	2	—	1	212	61	87

Total trading derivatives, net[4]	$(4,979)	$ 550	$	$(205)	$3,569	$ 108	$ (27)	$(156)	$ 239	$(901)	$ 232

Table continues on the next page, including footnotes.

In millions of dollars	Dec. 31, 2017	Net realized/unrealized gains (losses) included in Principal transactions	Other[1][2]	Transfers into Level 3	Transfers out of Level 3	Purchases	Issuances	Sales	Settlements	Dec. 31, 2018	Unrealized gains (losses) still held[3]
Investments											
Mortgage-backed securities											
U.S. government-sponsored agency guaranteed	$24	$ —	$ 10	$—	$—	$ —	$ —	$(2)	$ —	$32	$ 14
Residential	—	—	—	—	—	—	—	—	—	—	—
Commercial	3	—	2	1	(1)	—	—	(5)	—	—	—
Total investment mortgage-backed securities	$27	$ —	$ 12	$1	$(1)	$ —	$ —	$(7)	$ —	$32	$ 14
U.S. Treasury and federal agency securities	$—	$ —	$ —	$—	$—	$ —	$ —	$—	$ —	$—	$ —
State and municipal	737	—	(20)	—	(18)	211	—	(202)	—	708	(29)
Foreign government	92	—	(3)	3	(4)	141	—	(161)	—	68	4
Corporate	71	—	(1)	61	(66)	101	—	(10)	—	156	—
Marketable equity securities	2	—	1	—	—	—	—	(2)	(1)	—	—
Asset-backed securities	827	—	(21)	10	(524)	63	—	(168)	—	187	—
Other debt securities	—	—	—	—	—	—	—	—	—	—	—
Non-marketable equity securities	681	—	(95)	193	—	91	—	(234)	(50)	586	55
Total investments	$2,437	$ —	$ (127)	$268	$(613)	$ 607	$ —	$(784)	$ (51)	$1,737	$ 44
Loans	$550	$ —	$ (319)	$—	$13	$ 140	$ —	$(103)	$ (4)	$277	$ 236
Mortgage servicing rights	558	—	54	—	—	—	58	(18)	(68)	584	59
Other financial assets measured on a recurring basis	16	—	51	—	(11)	4	12	(12)	(60)	—	63
Liabilities											
Interest-bearing deposits	$286	$ —	$ 14	$13	$(1)	$ —	$ 215	$—	$ (4)	$495	$ (355)
Federal funds purchased and securities loaned and sold under agreements to repurchase	726	(8)	—	1	—	—	243	(31)	36	983	24
Trading account liabilities											
Securities sold, not yet purchased	22	(45)	4 —	187	(172)	7	226	(39)	(99)	586	(238)
Other trading liabilities	5	5	—	—	—	—	—	—	—	—	—
Short-term borrowings	18	53	—	72	(46)	—	86	—	(40)	37	25
Long-term debt	13,082	(18)	2 —	2,850	(3,514)	36	(18)	(45)	(3)	12,570	(2,871)
Other financial liabilities measured on a recurring basis	8	—	(2)	1	(10)	—	2	—	(3)	—	(8)

(1) Changes in fair value for available-for-sale investments are recorded in AOCI, unless related to other-than-temporary impairment, while gains and losses from sales are recorded in Realized gains (losses) from sales of investments in the Consolidated Statement of Income.

(2) Unrealized gains (losses) on MSRs are recorded in Other revenue in the Consolidated Statement of Income.

(3) Represents the amount of total gains or losses for the period, included in earnings (and AOCI for changes in fair value of available-for-sale investments), attributable to the change in fair value relating to assets and liabilities classified as Level 3 that are still held at December 31, 2018.

(4) Total Level 3 trading derivative assets and liabilities have been netted in these tables for presentation purposes only.

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In millions of dollars	Dec. 31, 2016	Net realized/unrealized gains (losses) included in Principal transactions	Other[1][2]	Transfers into Level 3	Transfers out of Level 3	Purchases	Issuances	Sales	Settlements	Dec. 31, 2017	Unrealized gains (losses) still held[3]
Assets											
Federal funds sold and securities borrowed and purchased under agreements to resell	$1,496	$(281)	$—	$—	$(1,198)	$—	$—	$—	$(1)	$16	$1
Trading non-derivative assets											
Trading mortgage-backed securities											
U.S. government-sponsored agency guaranteed	176	23	—	176	(174)	463	—	(504)	3	163	2
Residential	399	86	—	95	(118)	126	—	(424)	—	164	14
Commercial	206	15	—	69	(57)	450	—	(626)	—	57	(5)
Total trading mortgage-backed securities	$781	$124	$—	$340	$(349)	$1,039	$—	$(1,554)	$3	$384	$11
U.S. Treasury and federal agency securities	$1	$—	$—	$—	$—	$—	$—	$(1)	$—	$—	$—
State and municipal	296	28	—	24	(48)	161	(23)	(164)	—	274	8
Foreign government	40	1	—	89	(228)	291	—	(177)	—	16	—
Corporate	324	344	—	140	(185)	482	(8)	(828)	6	275	81
Equity securities	127	54	—	210	(58)	51	(3)	(261)	—	120	—
Asset-backed securities	1,868	284	—	44	(178)	1,457	—	(1,885)	—	1,590	36
Other trading assets	2,814	117	—	474	(2,691)	2,195	11	(2,285)	(20)	615	60
Total trading non-derivative assets	$6,251	$952	$—	$1,321	$(3,737)	$5,676	$(23)	$(7,155)	$(11)	$3,274	$196
Trading derivatives, net[4]											
Interest rate contracts	$(663)	$(44)	$—	$(28)	$610	$154	$(13)	$(322)	$(116)	$(422)	$77
Foreign exchange contracts	413	(438)	—	54	(60)	33	14	(21)	135	130	(139)
Equity contracts	(1,557)	129	—	(159)	28	184	(216)	(333)	(103)	(2,027)	(214)
Commodity contracts	(1,945)	(384)	—	77	35	—	23	(3)	336	(1,861)	149
Credit derivatives	(1,001)	(484)	—	(28)	18	6	16	(6)	680	(799)	(169)
Total trading derivatives, net[4]	$(4,753)	$(1,221)	$—	$(84)	$631	$377	$(176)	$(685)	$932	$(4,979)	$(296)
Investments											
Mortgage-backed securities											
U.S. government-sponsored	$101	$—	$16	$1	$(94)	$—	$—	$—	$—	$24	$(2)

agency guaranteed												
Residential	50	—	2	—	(47)	—	—	(5)	—	—	—	
Commercial	—	—	—	3	—	12	—	(12)	—	3	—	
Total investment mortgage-backed securities	$151	$—	$18	$4	$(141)	$12	$—	$(17)	$—	$27	$(2)	
U.S. Treasury and federal agency securities	$2	$—	$—	$—	$—	$—	$—	$(2)	$—	$—	$—	
State and municipal	1,211	—	58	70	(517)	127	—	(212)	—	737	44	
Foreign government	186	—	—	2	(284)	523	—	(335)	—	92	1	
Corporate	311	—	9	77	(47)	227	—	(506)	—	71	—	
Marketable equity securities	9	—	(1)	—	—	—	—	(6)	—	2	—	
Asset-backed securities	660	—	(89)	31	(32)	883	—	(626)	—	827	12	
Other debt securities	—	—	—	—	—	21	—	(21)	—	—	—	
Non-marketable equity securities	1,331	—	(170)	2	—	19	—	(233)	(268)	681	44	
Total investments	$3,861	$—	$(175)	$186	$(1,021)	$1,812	$—	$(1,958)	$(268)	$2,437	$99	

Table continues on the next page, including footnotes.

In millions of dollars	Dec. 31, 2016	Net realized/unrealized gains (losses) included in Principal transactions	Other[1][2]	Transfers into Level 3	Transfers out of Level 3	Purchases	Issuances	Sales	Settlements	Dec. 31, 2017	Unrealized gains (losses) still held[3]
Loans	$568	$ —	$ 75	$80	$(16)	$ 188	$ —	$(337)	$ (8)	$ 550	$ 211
Mortgage servicing rights	1,564	—	65	—	—	—	96	(1,057)	(110)	558	74
Other financial assets measured on a recurring basis	34	—	(128)	10	(8)	1	318	(14)	(197)	16	(152)
Liabilities											
Interest-bearing deposits	$293	$ —	$ 25	$40	$—	$ —	$ 2	$—	$ (24)	$ 286	$ 22
Federal funds purchased and securities loaned and sold under agreements to repurchase	849	14	—	—	—	—	36	—	(145)	726	10
Trading account liabilities											
Securities sold, not yet purchased	1,177	385	—	22	(796)	—	17	277	(290)	22	8
Other trading liabilities	1	—	—	4	—	—	—	—	—	5	—
Short-term borrowings	42	32	—	4	(7)	—	31	—	(20)	18	(3)
Long-term debt	9,744	(1,083)	—	1,251	(1,836)	644	2,712	—	84	13,082	(1,554)
Other financial liabilities measured on a recurring basis	8	—	—	5	—	—	5	(1)	(9)	8	(1)

(1) Changes in fair value of available-for-sale investments are recorded in AOCI, unless related to other-than-temporary impairment, while gains and losses from sales are recorded in Realized gains (losses) from sales of investments in the Consolidated Statement of Income.

(2) Unrealized gains (losses) on MSRs are recorded in Other revenue in the Consolidated Statement of Income.

(3) Represents the amount of total gains or losses for the period, included in earnings (and AOCI for changes in fair value of available-for-sale investments), attributable to the change in fair value relating to assets and liabilities classified as Level 3 that are still held at December 31, 2017.

(4) Total Level 3 derivative assets and liabilities have been netted in these tables for presentation purposes only.

Level 3 Fair Value Rollforward

The following were the significant Level 3 transfers for the period December 31, 2017 to December 31, 2018:

- Transfers of Equity Contract Derivatives of $1.1 billion from Level 3 to Level 2 related to equity derivatives where the unobservable components were deemed insignificant.
- Transfers of Commodity Contract Derivatives of $2.2 billion from Level 3 to Level 2 related to commodity derivatives where the unobservable component of the derivatives were deemed insignificant.
- Transfers of Long-Term Debt of $2.9 billion from Level 2 to Level 3, and of $3.5 billion from Level 3 to Level 2, mainly related to structured debt, reflecting changes in the significance of unobservable inputs as well as certain underlying market inputs becoming less or more observable.

The following were the significant Level 3 transfers for the period December 31, 2016 to December 31, 2017:

- Transfers of Federal funds sold and securities borrowed or purchased under agreements to resell of $1.2 billion from Level 3 to Level 2, related to the significance of unobservable inputs as well as certain underlying market inputs becoming more observable and shortening of the remaining tenor of certain reverse repos. There is more transparency and observability for repo curves used in the valuation of structured reverse repos with tenors up to five years.

- Transfers of Other trading assets of $2.7 billion from Level 3 to Level 2, related to trading loans, reflecting changes in the volume of market quotations changes in the significance of unobservable inputs for certain portfolios of trading loans economically hedging derivatives, and certain underlying market inputs becoming more observable as a result of secondary market transactions for portfolios of residential mortgage loans with similar characteristics.
- Transfers of Long-term debt of $1.3 billion from Level 2 to Level 3, and of $1.8 billion from Level 3 to Level 2, mainly related to structured debt, reflecting changes in the significance of unobservable inputs as well as certain underlying market inputs becoming less or more observable.

Valuation Techniques and Inputs for Level 3 Fair Value Measurements

The Company's Level 3 inventory consists of both cash instruments and derivatives of varying complexity. The valuation methodologies used to measure the fair value of these positions include discounted cash flow analysis, internal models and comparative analysis. A position is classified within Level 3 of the fair value hierarchy when at least one input is unobservable and is considered significant to its valuation. The specific reason an input is deemed unobservable varies; for example, at least one significant input to the pricing model is not observable in the market, at least one significant input has been adjusted to make it more representative of the position being valued or the price quote available does not reflect sufficient trading activities.

The following tables present the valuation techniques covering the majority of Level 3 inventory and the most significant unobservable inputs used in Level 3 fair value measurements. Differences between this table and amounts presented in the Level 3 Fair Value Rollforward table represent individually immaterial items that have been measured using a variety of valuation techniques other than those listed.

As of December 31, 2018	Fair value[1] (in millions)	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
Assets						
Federal funds sold and securities borrowed and purchased under agreements to resell	$ 115	Model-based	Interest rate	2.52 %	7.43 %	5.08 %
Mortgage-backed securities	$ 313	Price-based	Price	$11.25	$110.35	$90.07
	198	Yield analysis	Yield	2.27 %	8.70 %	3.74 %
State and municipal, foreign government, corporate and other debt securities	$ 1,212	Price-based	Price	$—	$103.75	$91.39
	938	Model-based	Credit spread	35 bps	446 bps	238 bps
Equity securities[5]	$ 108	Price-based	Price	$—	$20,255.00	$1,247.85
	45	Model-based	WAL	1.47 years	1.47 years	1.47 years
Asset-backed securities	$ 1,608	Price-based	Price	$2.75	$101.03	$66.18
Non-marketable equity	$ 293	Comparables analysis	Discount to price	— %	100.00 %	0.66 %
	255	Price-based	EBITDA multiples	5.00x	34.00x	9.73x
			Net operating income multiple	24.70x	24.70x	24.70x
			Price	$2.38	$1,073.80	$420.24
			Revenue multiple	2.25x	16.50x	7.06x
Derivatives—gross[6]						
Interest rate contracts (gross)	$ 3,467	Model-based	Mean reversion	1.00 %	20.00 %	10.50 %
			Inflation volatility	0.22 %	2.65 %	0.77 %

			IR normal volatility	0.16	%	86.31	%	56.24	%
Foreign exchange contracts (gross)	$ 626	Model-based	Foreign exchange (FX) volatility	3.15	%	17.35	%	11.37	%
	73	Cash flow	IR-IR correlation	(51.00)	%	40.00	%	32.69	%
			IR-FX correlation	40.00	%	60.00	%	50.00	%
			Credit spread	39 bps		676 bps		423 bps	
			IR basis	(0.65)	%	0.11	%	(0.17)	%
			Yield	6.98	%	7.48	%	7.23	%
Equity contracts (gross)[7]	$ 1,467	Model-based	Equity volatility	3.00	%	78.39	%	37.53	%
			Forward price	64.66	%	144.45	%	98.55	%
			Equity-Equity correlation	(81.39)	%	100.00	%	35.49	%
			Equity-FX correlation	(86.27)	%	70.00	%	(1.20)	%
			WAL	1.47 years		1.47 years		1.47 years	
Commodity contracts (gross)	$ 1,552	Model-based	Forward price	15.30	%	585.07	%	145.08	%
			Commodity volatility	8.92	%	59.86	%	20.34	%
			Commodity correlation	(51.90)	%	92.11	%	40.71	%

As of December 31, 2018	Fair value[1] (in millions)	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
Credit derivatives (gross)	$ 1,089	Model-based	Credit correlation	5.00 %	85.00 %	41.06 %
	701	Price-based	Upfront points	7.41 %	99.04 %	58.95 %
			Credit spread	2 bps	1,127 bps	87 bps
			Recovery rate	5.00 %	65.00 %	46.40 %
			Price	$ 16.59	$ 98.00	$ 81.19
Loans and leases	$ 248	Model-based	Credit spread	138 bps	255 bps	147 bps
	29	Price-based	Yield	0.30 %	0.47 %	0.32 %
			Price	$ 55.83	$ 110.00	$ 92.40
Mortgage servicing rights	$ 501	Cash flow	Yield	4.60 %	12.00 %	7.79 %
	84	Model-based	WAL	3.55 years	7.45 years	6.39 years
Liabilities						
Interest-bearing deposits	$ 495	Model-based	Mean reversion	1.00 %	20.00 %	10.50 %
			Forward price	64.66 %	144.45 %	98.55 %
			Equity volatility	3.00 %	78.39 %	43.49 %
Federal funds purchased and securities loaned and sold under agreements to repurchase	$ 983	Model-based	Interest rate	2.52 %	3.21 %	2.87 %
Trading account liabilities						
Securities sold, not yet purchased	$ 509	Model-based	Forward price	15.30 %	585.07 %	105.69 %
	77	Price-based	Equity volatility	3.00 %	78.39 %	43.49 %
			Equity-Equity correlation	(81.39)%	100.00 %	34.04 %
			Equity-FX correlation	(86.27)%	70.00 %	(1.20)%
			Commodity volatility	8.92 %	59.86 %	20.34 %
			Commodity correlation	(51.90)%	92.11 %	40.71 %
			Equity-IR correlation	(40.00)%	70.37 %	30.80 %
Short-term borrowings and long-term debt	$ 12,289	Model-based	Mean reversion	1.00 %	20.00 %	10.50 %
			IR normal volatility	0.16 %	86.31 %	56.61 %
			Forward price	64.66 %	144.45 %	98.58 %
			Equity volatility	3.00 %	78.39 %	43.24 %

As of December 31, 2017	Fair value[1] (in millions)	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
Assets						
Federal funds sold and securities borrowed and purchased under	$ 16	Model-based	Interest rate	1.43 %	2.16 %	2.09 %

agreements to resell							
Mortgage-backed securities	$ 214	Price-based	Price	$2.96	$101.00	$56.52	
	184	Yield analysis	Yield	2.52 %	14.06 %	5.97 %	
State and municipal, foreign government, corporate and other debt securities	$ 949	Model-based	Price	$—	$184.04	$91.74	
	914	Price-based	Credit spread	35 bps	500 bps	249 bps	
			Yield	2.36 %	14.25 %	6.03 %	
Marketable equity securities[5]	$ 65	Priced-based	Price	$—	$25,450.00	$2,526.62	
	55	Model-based	WAL	2.50 years	2.50 years	2.50 years	
Asset-backed securities	$ 2,287	Price-based	Price	$4.25	$100.60	$74.57	
Non-marketable equity	$ 423	Comparables analysis	EBITDA multiples	6.90x	12.80x	8.66x	

As of December 31, 2017	Fair value[1] (in millions)	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
	223	Price-based	Discount to price	— %	100.00 %	11.83 %
			Price-to-book ratio	0.05x	1.00x	0.32x
Derivatives—gross[6]						
Interest rate contracts (gross)	$ 3,818	Model-based	IR normal volatility	9.40 %	77.40 %	58.86 %
			Mean reversion	1.00 %	20.00 %	10.50 %
Foreign exchange contracts (gross)	$ 940	Model-based	Foreign exchange (FX) volatility	4.58 %	15.02 %	8.16 %
			Interest rate	(0.55)%	0.28 %	0.04 %
			IR-IR correlation	(51.00)%	40.00 %	36.56 %
			IR-FX correlation	(7.34)%	60.00 %	49.04 %
			Credit spread	11 bps	717 bps	173 bps
Equity contracts (gross)[7]	$ 2,897	Model-based	Equity volatility	3.00 %	68.93 %	24.66 %
			Forward price	69.74 %	154.19 %	92.80 %
Commodity contracts (gross)	$ 2,937	Model-based	Forward price	3.66 %	290.59 %	114.16 %
			Commodity volatility	8.60 %	66.73 %	25.04 %
			Commodity correlation	(37.64)%	91.71 %	15.21 %
Credit derivatives (gross)	$ 1,797	Model-based	Credit correlation	25.00 %	90.00 %	44.64 %
	823	Price-based	Upfront points	6.03 %	97.26 %	62.88 %
			Credit spread	3 bps	1,636 bps	173 bps
			Price	$ 1.00	$ 100.24	$ 57.63
Nontrading derivatives and other financial assets and liabilities measured on a recurring basis (gross)[6]	$ 24	Model-based	Recovery rate	25.00 %	40.00 %	31.56 %
			Redemption rate	10.72 %	99.50 %	74.24 %
			Credit spread	38 bps	275 bps	127 bps
			Upfront points	61.00 %	61.00 %	61.00 %
Loans and leases	$ 391	Model-based	Equity volatility	3.00 %	68.93 %	22.52 %
	148	Price-based	Credit spread	134 bps	500 bps	173 bps
			Yield	3.09 %	4.40 %	3.13 %
Mortgage servicing rights	$ 471	Cash flow	Yield	8.00 %	16.38 %	11.47 %
	87	Model-based	WAL	3.83 years	6.89 years	5.93 years
Liabilities						
Interest-bearing deposits	$ 286	Model-based	Mean reversion	1.00 %	20.00 %	10.50 %
			Forward price	99.56 %	99.95 %	99.72 %
Federal funds purchased and securities loaned and sold under agreements to repurchase	$ 726	Model-based	Interest rate	1.43 %	2.16 %	2.09 %
Trading account liabilities						

Securities sold, not yet purchased	$ 21	Price-based	Price	$ 1.00	$ 287.64	$ 88.19
Short-term borrowings and long-term debt	$ 13,100	Model-based	Forward price	69.74 %	161.11 %	100.70 %

(1) The fair value amounts presented in these tables represent the primary valuation technique or techniques for each class of assets or liabilities.
(2) Some inputs are shown as zero due to rounding.
(3) When the low and high inputs are the same, there is either a constant input applied to all positions or the methodology involving the input applies to only one large position.
(4) Weighted averages are calculated based on the fair values of the instruments.
(5) For equity securities, the price and fund NAV inputs are expressed on an absolute basis, not as a percentage of the notional amount.
(6) Both trading and nontrading account derivatives—assets and liabilities—are presented on a gross absolute value basis.
(7) Includes hybrid products.

Uncertainty of Fair Value Measurements Relating to Unobservable Inputs

Valuation uncertainty arises when there is insufficient or disperse market data to allow a precise determination of the exit value of a fair-valued position or portfolio in today's market. This is especially prevalent in Level 3 fair value instruments, where uncertainty exists in valuation inputs that may be both unobservable and significant to the instrument's (or portfolio's) overall fair value measurement. The uncertainties associated with key unobservable inputs on the Level 3 fair value measurements may not be independent of one another. In addition, the amount and direction of the uncertainty on a fair value measurement for a given change in an unobservable input depends on the nature of the instrument as well as whether the Company holds the instrument as an asset or a liability. For certain instruments, the pricing, hedging and risk management are sensitive to the correlation between various inputs rather than on the analysis and aggregation of the individual inputs.

The following section describes some of the most significant unobservable inputs used by the Company in Level 3 fair value measurements.

Correlation

Correlation is a measure of the extent to which two or more variables change in relation to each other. A variety of correlation-related assumptions are required for a wide range of instruments, including equity and credit baskets, foreign exchange options, CDOs backed by loans or bonds, mortgages, subprime mortgages and many other instruments. For almost all of these instruments, correlations are not directly observable in the market and must be calculated using alternative sources, including historical information. Estimating correlation can be especially difficult where it may vary over time, and calculating correlation information from market data requires significant assumptions regarding the informational efficiency of the market (e.g., swaption markets). Uncertainty therefore exists when an estimate of the appropriate level of correlation as an input into some fair value measurements is required. Changes in correlation levels can have a substantial impact, favorable or unfavorable, on the value of an instrument, depending on its nature. A change in the default correlation of the fair value of the underlying bonds comprising a CDO structure would affect the fair value of the senior tranche. For example, an increase in the default correlation of the underlying bonds would reduce the fair value of the senior tranche, because highly correlated instruments produce greater losses in the event of default and a portion of these losses would become attributable to the senior tranche. That same change in default correlation would have a different impact on junior tranches of the same structure.

Volatility

Volatility represents the speed and severity of market price changes and is a key factor in pricing options. Volatility generally depends on the tenor of the underlying instrument and the strike price or level defined in the contract. Volatilities

for certain combinations of tenor and strike are not observable and need to be estimated using alternative methods, such as using comparable instruments, historical analysis or other sources of market information. This leads to uncertainty around the final fair value measurement of instruments with unobservable volatilities.

The general relationship between changes in the value of a portfolio to changes in volatility also depends on changes in interest rates and the level of the underlying index. Generally, long option positions (assets) benefit from increases in volatility, whereas short option positions (liabilities) will suffer losses. Some instruments are more sensitive to changes in volatility than others. For example, an at-the-money option would experience a greater percentage change in its fair value than a deep-in-the-money option. In addition, the fair value of an option with more than one underlying security (e.g., an option on a basket of bonds) depends on the volatility of the individual underlying securities as well as their correlations.

Yield

In some circumstances, the yield of an instrument is not observable in the market and must be estimated from historical data or from yields of similar securities. This estimated yield may need to be adjusted to capture the characteristics of the security being valued. In other situations, the estimated yield may not represent sufficient market liquidity and must be adjusted as well. Whenever the amount of the adjustment is significant to the value of the

security, the fair value measurement is classified as Level 3.
Adjusted yield is generally used to discount the projected future principal and interest cash flows on instruments, such as asset-backed securities. Adjusted yield is impacted by changes in the interest rate environment and relevant credit spreads.

Prepayment
Voluntary unscheduled payments (prepayments) change the future cash flows for the investor and thereby change the fair value of the security. The effect of prepayments is more pronounced for residential mortgage-backed securities. An increase in prepayments—in speed or magnitude—generally creates losses for the holder of these securities. Prepayment is generally negatively correlated with delinquency and interest rate. A combination of low prepayment and high delinquencies amplifies each input's negative impact on mortgage securities' valuation. As prepayment speeds change, the weighted average life of the security changes, which impacts the valuation either positively or negatively, depending upon the nature of the security and the direction of the change in the weighted average life.

Recovery
Recovery is the proportion of the total outstanding balance of a bond or loan that is expected to be collected in a liquidation scenario. For many credit securities (such as asset-backed securities), there is no directly observable market input for recovery, but indications of recovery levels are available from pricing services. The assumed recovery of a security may differ from its actual recovery that will be observable in the future. The recovery rate impacts the valuation of credit

securities. Generally, an increase in the recovery rate assumption increases the fair value of the security. An increase in loss severity, the inverse of the recovery rate, reduces the amount of principal available for distribution and, as a result, decreases the fair value of the security.

Credit Spread

Credit spread is a component of the security representing its credit quality. Credit spread reflects the market perception of changes in prepayment, delinquency and recovery rates, therefore capturing the impact of other variables on the fair value. Changes in credit spread affect the fair value of securities differently depending on the characteristics and maturity profile of the security. For example, credit spread is a more significant driver of the fair value measurement of a high yield bond as compared to an investment grade bond. Generally, the credit spread for an investment grade bond is also more observable and less volatile than its high yield counterpart.

Items Measured at Fair Value on a Nonrecurring Basis

Certain assets and liabilities are measured at fair value on a nonrecurring basis and therefore are not included in the tables above. These include assets measured at cost that have been written down to fair value during the periods as a result of an impairment. These also include non-marketable equity securities that have been measured using the measurement alternative and are either (i) written down to fair value during the periods as a result of an impairment or (ii) adjusted upward or downward to fair value as a result of a transaction observed during the periods for the identical or similar investment of the same issuer. In addition, these assets include loans HFS and other real estate owned that are measured at the lower of cost or market.

The following tables present the carrying amounts of all assets that were still held for which a nonrecurring fair value measurement was recorded:

In millions of dollars	Fair value	Level 2	Level 3
December 31, 2018			
Loans HFS[1]	$5,055	$3,261	$1,794
Other real estate owned	78	62	16
Loans[2]	390	139	251
Non-marketable equity securities measured using the measurement alternative	261	192	69
Total assets at fair value on a nonrecurring basis	$5,784	$3,654	$2,130

In millions of dollars	Fair value	Level 2	Level 3
December 31, 2017			
Loans HFS[1]	$5,675	$2,066	$3,609
Other real estate owned	54	10	44
Loans[2]	630	216	414
Total assets at fair value on a nonrecurring basis	$6,359	$2,292	$4,067

(1) Net of fair value amounts on the unfunded portion of loans HFS, recognized within Other liabilities on the Consolidated Balance Sheet.

(2) Represents impaired loans held for investment whose carrying amount is based on the fair value of the underlying collateral, primarily real estate secured loans.

The fair value of loans HFS is determined where possible using quoted secondary-market prices. If no such quoted price exists, the fair value of a loan is determined using quoted prices for a similar asset or assets, adjusted for the specific attributes of that loan. Fair value for the other real estate owned is based on appraisals. For loans whose carrying amount is based on the fair value of the underlying collateral, the fair values depend on the type of collateral. Fair value of the collateral is typically estimated based on quoted market prices if available, appraisals or other internal valuation techniques.

Where the fair value of the related collateral is based on an unadjusted appraised value, the loan is generally classified as Level 2. Where significant adjustments are made to the appraised value, the loan is classified as Level 3. Additionally,

for corporate loans, appraisals of the collateral are often based on sales of similar assets; however, because the prices of similar assets require significant adjustments to reflect the unique features of the underlying collateral, these fair value measurements are generally classified as Level 3.

The fair value of non-marketable equity securities under the measurement alternative is based on observed transaction prices for the identical or similar investment of the same issuer, or an internal valuation technique in the case of an impairment. Where significant adjustments are made to the observed transaction price or when an internal valuation technique is used, the security is classified as Level 3. Fair value may differ from the observed transaction price due to a number of factors, including marketability adjustments and differences in rights and obligations when the observed transaction is not for the identical investment held by Citi.

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Valuation Techniques and Inputs for Level 3 Nonrecurring Fair Value Measurements

The following tables present the valuation techniques covering the majority of Level 3 nonrecurring fair value measurements and the most significant unobservable inputs used in those measurements:

As of December 31, 2018	Fair value[1] (in millions)	Methodology	Input	Low[2]	High	Weighted average[3]
Loans HFS	$ 1,729	Price-based	Price	$0.79	$100.00	$69.52
Other real estate owned	$ 15	Price-based	Appraised value[4]	$8,394,102	$8,394,102	$8,394,102
	2	Recovery analysis	Discount to price[5]	13.00 %	13.00 %	13.00 %
			Price	$56.30	$83.08	$58.27
Loans[6]	$ 251	Recovery analysis	Recovery rate	30.60 %	100.00 %	50.51 %
			Price	$2.60	$85.04	$28.21
Non-marketable equity securities measured using the measurement alternative	$ 66	Price-based	Price	$45.80	$1,514.00	$570.26

As of December 31, 2017	Fair value[1] (in millions)	Methodology	Input	Low[2]	High	Weighted average[3]
Loans HFS	$ 3,186	Price-based	Price	$77.93	$100.00	$99.26
Other real estate owned	$ 42	Price-based	Appraised value[4]	$20,278	$8,091,760	$4,016,665
			Discount to price	34.00 %	34.00 %	34.00 %
			Price	$30.00	$50.36	$49.09
Loans[4]	$ 133	Price-based	Price	$2.80	$100.00	$62.46
	129	Cash flow	Recovery rate	50.00 %	100.00 %	63.59 %
	127	Recovery analysis	Appraised value	$—	$45,500,000	$38,785,667

(1) The fair value amounts presented in this table represent the primary valuation technique or techniques for each class of assets or liabilities.
(2) Some inputs are shown as zero due to rounding.
(3) Weighted averages are calculated based on the fair values of the instruments.
(4) Appraised values are disclosed in whole dollars.
(5) Includes estimated costs to sell.
(6) Represents impaired loans held for investment whose carrying amounts are based on the fair value of the underlying collateral, primarily real estate secured loans.

Nonrecurring Fair Value Changes

The following tables present total nonrecurring fair value measurements for the period, included in earnings, attributable to the change in fair value relating to assets that were still held:

In millions of dollars	Year ended December 31, 2018
Loans HFS	$ (13)
Other real estate owned	(2)
Loans[1]	(22)
Non-marketable equity securities measured using the measurement alternative	194
Total nonrecurring fair value gains (losses)	$ 157

In millions of dollars	Year ended December 31, 2017
Loans HFS	$ (26)
Other real estate owned	(4)
Loans[1]	(87)
Non-marketable equity securities measured using the measurement alternative	—
Total nonrecurring fair value gains (losses)	$ (117)

(1) Represents loans held for investment whose carrying amount is based on the fair value of the underlying collateral, primarily real estate loans.

Estimated Fair Value of Financial Instruments not Carried at Fair Value

The following tables present the carrying value and fair value of Citigroup's financial instruments that are not carried at fair value. The tables below therefore exclude items measured at fair value on a recurring basis presented in the tables above.

The disclosure also excludes leases, affiliate investments, pension and benefit obligations, certain insurance contracts and tax-related items. Also, as required, the disclosure excludes the effect of taxes, any premium or discount that could result from offering for sale at one time the entire holdings of a particular instrument, excess fair value associated with deposits with no fixed maturity and other expenses that would be incurred in a market transaction. In addition, the tables exclude the values of non-financial assets and liabilities, as well as a wide range of franchise, relationship and intangible values, which are integral to a full assessment of Citigroup's financial position and the value of its net assets.

Fair values vary from period to period based on changes in a wide range of factors, including interest rates, credit quality and market perceptions of value, and as existing assets and liabilities run off and new transactions are entered into.

	December 31, 2018		Estimated fair value		
In billions of dollars	Carrying value	Estimated fair value	Level 1	Level 2	Level 3
Assets					
Investments	$68.9	$68.5	$1.0	$65.4	$2.1
Federal funds sold and securities borrowed and purchased under agreements to resell	123.0	123.0	—	121.6	1.4
Loans[1][2]	667.1	666.9	—	5.6	661.3
Other financial assets[2][3]	249.7	250.1	172.3	15.8	62.0
Liabilities					
Deposits	$1,011.7	$1,009.5	$—	$847.1	$162.4
Federal funds purchased and securities loaned or sold under agreements to repurchase	133.3	133.3	—	133.3	—
Long-term debt[4]	193.8	193.7	—	178.4	15.3
Other financial liabilities[5]	103.8	103.8	—	17.2	86.6

	December 31, 2017		Estimated fair value		
In billions of dollars	Carrying value	Estimated fair value	Level 1	Level 2	Level 3
Assets					
Investments	$60.2	$ 60.6	$0.5	$57.5	$2.6
Federal funds sold and securities borrowed and purchased under agreements to resell	99.5	99.5	—	94.4	5.1
Loans[1][2]	648.6	644.9	—	6.0	638.9
Other financial assets[2][3]	242.6	243.0	166.4	14.1	62.5
Liabilities					
Deposits	$958.4	$ 955.6	$—	$816.1	$139.5
Federal funds purchased and securities loaned and sold under agreements to repurchase	115.6	115.6	—	115.6	—
Long-term debt[4]	205.3	214.0	—	187.2	26.8
Other financial liabilities[5]	129.9	129.9	—	15.5	114.4

(1) The carrying value of loans is net of the Allowance for loan losses of $12.3 billion for December 31, 2018 and $12.4 billion for December 31, 2017. In addition, the carrying values exclude $1.6 billion and $1.7 billion of lease finance receivables at December 31, 2018 and 2017, respectively.

(2) Includes items measured at fair value on a nonrecurring basis.

(3) Includes cash and due from banks, deposits with banks, brokerage receivables, reinsurance recoverable and other financial instruments included in Other assets on the Consolidated Balance Sheet, for all of which the carrying value is a reasonable estimate of fair value.

(4) The carrying value includes long-term debt balances under qualifying fair value hedges.

(5) Includes brokerage payables, short-term borrowings (carried at cost) and other financial instruments included in Other liabilities on the Consolidated Balance Sheet, for all of which the carrying value is a reasonable estimate of fair value.

The estimated fair values of the Company’s corporate unfunded lending commitments at December 31, 2018 and 2017 were liabilities of $7.8 billion and $3.2 billion, respectively, substantially all of which are classified as Level 3. The Company does not estimate the fair values of consumer unfunded lending commitments, which are generally cancelable by providing notice to the borrower.

25. FAIR VALUE ELECTIONS

The Company may elect to report most financial instruments and certain other items at fair value on an instrument-by-instrument basis with changes in fair value reported in earnings, other than DVA (see below). The election is made upon the initial recognition of an eligible financial asset, financial liability or firm commitment or when certain specified reconsideration events occur. The fair value election may not be revoked once an election is made. The changes in

fair value are recorded in current earnings, other than DVA, which is reported in AOCI. Additional discussion regarding the applicable areas in which fair value elections were made is presented in Note 24 to the Consolidated Financial Statements.

The Company has elected fair value accounting for its mortgage servicing rights. See Note 21 to the Consolidated Financial Statements for further discussions regarding the accounting and reporting of MSRs.

The following table presents the changes in fair value of those items for which the fair value option has been elected:

	Changes in fair value gains (losses) for the years ended December 31,	
In millions of dollars	2018	2017
Assets		
Federal funds sold and securities borrowed and purchased under agreements to resell	$(6)	$(133)
Trading account assets	(337)	1,622
Investments	—	(3)
Loans		
Certain corporate loans	(116)	(537)
Certain consumer loans	—	3
Total loans	$(116)	$(534)
Other assets		
MSRs	$54	$65
Certain mortgage loans HFS[1]	38	142
Other assets	—	—
Total other assets	$92	$207
Total assets	$(367)	$1,159
Liabilities		
Interest-bearing deposits	$20	$(69)
Federal funds purchased and securities loaned and sold under agreements to repurchase	(118)	223
Trading account liabilities	(13)	70
Short-term borrowings	150	(116)
Long-term debt[2]	3,048	(1,491)
Total liabilities	$3,087	$(1,383)

(1) Includes gains (losses) associated with interest rate lock-commitments for those loans that have been originated and elected under the fair value option.

(2) Includes $1.4 billion and ($0.7) billion of DVA which is included in AOCI for the years ended December 31, 2018 and 2017, respectively.

Own Debt Valuation Adjustments (DVA)

Own debt valuation adjustments are recognized on Citi's liabilities for which the fair value option has been elected using Citi's credit spreads observed in the bond market. Effective January 1, 2016, changes in fair value of fair value option liabilities related to changes in Citigroup's own credit spreads (DVA) are reflected as a component of AOCI. See Note 1 to the Consolidated Financial Statements for additional information.

Among other variables, the fair value of liabilities for which the fair value option has been elected (other than non-recourse and similar liabilities) is impacted by the narrowing or widening of the Company's credit spreads. The estimated change in the fair value of these liabilities due to such changes in the Company's own credit spread (or instrument-specific credit risk) were a gain of $1,415 million and a loss of $680 million for the years ended December 31, 2018 and 2017, respectively. Changes in fair value resulting from changes in instrument-specific credit risk were estimated by incorporating the Company's current credit spreads observable in the bond market into the relevant valuation technique used to value each liability as described above.

The Fair Value Option for Financial Assets and Financial Liabilities

Selected Portfolios of Securities Purchased Under Agreements to Resell, Securities Borrowed, Securities Sold Under Agreements to Repurchase, Securities Loaned and Certain Non-Collateralized Short-Term Borrowings

The Company elected the fair value option for certain portfolios of fixed income securities purchased under agreements to resell and fixed income securities sold under agreements to repurchase, securities borrowed, securities loaned and certain non-collateralized short-term borrowings held primarily by broker-dealer entities in the United States, United Kingdom and Japan. In each case, the election was made because the related interest rate risk is managed on a portfolio basis, primarily with offsetting derivative instruments that are accounted for at fair value through earnings.

Changes in fair value for transactions in these portfolios are recorded in Principal transactions. The related interest revenue and interest expense are measured based on the contractual rates specified in the transactions and are reported as Interest revenue and Interest expense in the Consolidated Statement of Income.

Certain Loans and Other Credit Products

Citigroup has also elected the fair value option for certain other originated and purchased loans, including certain unfunded loan products, such as guarantees and letters of credit, executed by Citigroup's lending and trading businesses. None of these credit products are highly leveraged financing commitments. Significant groups of transactions include loans and unfunded loan products that are expected to be either sold or securitized in the near term, or transactions where the economic risks are hedged with derivative instruments, such as purchased credit default swaps or total return swaps where the Company pays the total return on the underlying loans to a third party. Citigroup has elected the fair value option to mitigate accounting mismatches in cases where hedge accounting is complex and to achieve operational simplifications. Fair value was not elected for most lending transactions across the Company.

The following table provides information about certain credit products carried at fair value:

	December 31, 2018		December 31, 2017	
In millions of dollars	Trading assets	Loans	Trading assets	Loans
Carrying amount reported on the Consolidated Balance Sheet	$10,108	$3,224	$8,851	$4,374
Aggregate unpaid principal balance in excess of fair value	435	741	623	682
Balance of non-accrual loans or loans more than 90 days past due	—	1	—	1
Aggregate unpaid principal balance in excess of fair value for non-accrual loans or loans more than 90 days past due	—	—	—	1

In addition to the amounts reported above, $1,137 million and $508 million of unfunded commitments related to certain credit products selected for fair value accounting were outstanding as of December 31, 2018 and 2017,

respectively.

Changes in the fair value of funded and unfunded credit products are classified in Principal transactions in Citi's Consolidated Statement of Income. Related interest revenue is measured based on the contractual interest rates and reported as Interest revenue on Trading account assets or loan interest depending on the balance sheet classifications of the credit products. The changes in fair value for the years ended December 31, 2018 and 2017 due to instrument-specific credit risk totaled to a loss of $27 million and a gain of $10 million, respectively.

Certain Investments in Unallocated Precious Metals

Citigroup invests in unallocated precious metals accounts (gold, silver, platinum and palladium) as part of its commodity and foreign currency trading activities or to economically hedge certain exposures from issuing structured liabilities. Under ASC 815, the investment is bifurcated into a debt host contract and a commodity forward derivative instrument. Citigroup elects the fair value option for the debt host contract, and reports the debt host contract within Trading account assets on the Company's Consolidated Balance Sheet. The total carrying amount of debt host contracts across unallocated precious metals accounts was approximately $0.4 billion and $0.9 billion at December 31, 2018 and 2017, respectively. The amounts are expected to fluctuate based on trading activity in future periods.

As part of its commodity and foreign currency trading activities, Citi trades unallocated precious metals investments and executes forward purchase and forward sale derivative contracts with trading counterparties. When Citi sells an unallocated precious metals investment, Citi's receivable from its depository bank is repaid and Citi derecognizes its investment in the unallocated precious metal. The forward purchase or sale contract with the trading counterparty indexed to unallocated precious metals is accounted for as a derivative, at fair value through earnings. As of December 31, 2018, there were approximately $13.7 billion and $10.3 billion in notional amounts of such forward purchase and forward sale derivative contracts outstanding, respectively.

Certain Investments in Private Equity and Real Estate Ventures and Certain Equity Method and Other Investments

Citigroup invests in private equity and real estate ventures for the purpose of earning investment returns and for capital appreciation. The Company has elected the fair value option for certain of these ventures, because such investments are considered similar to many private equity or hedge fund activities in Citi's investment companies, which are reported at fair value. The fair value option brings consistency in the accounting and evaluation of these investments. All investments (debt and equity) in such private equity and real estate entities are accounted for at fair value. These investments are classified as Investments on Citigroup's Consolidated Balance Sheet.

Changes in the fair values of these investments are classified in Other revenue in the Company's Consolidated Statement of Income.

Citigroup also elected the fair value option for certain non-marketable equity securities whose risk is managed with derivative instruments that are accounted for at fair value through earnings. These securities are classified as Trading account assets on Citigroup's Consolidated Balance Sheet. Changes in the fair value of these securities and the related derivative instruments are recorded in Principal transactions. Effective January 1, 2018 under ASU 2016-01 and ASU 2018-03, a fair value option election is no longer required to measure these non-marketable equity securities through earnings. See Note 1 to the Consolidated Financial Statements for additional details.

Certain Mortgage Loans Held-for-Sale

Citigroup has elected the fair value option for certain purchased and originated prime fixed-rate and conforming adjustable-rate first mortgage loans HFS. These loans are intended for sale or securitization and are hedged with derivative instruments. The Company has elected the fair value option to mitigate accounting mismatches in cases where hedge accounting is complex and to achieve operational simplifications.

The following table provides information about certain mortgage loans HFS carried at fair value:

In millions of dollars	December 31, 2018	December 31, 2017
Carrying amount reported on the Consolidated Balance Sheet	$ 556	$ 426

Aggregate fair value in excess of (less than) unpaid principal balance	21	14
Balance of non-accrual loans or loans more than 90 days past due	—	—
Aggregate unpaid principal balance in excess of fair value for non-accrual loans or loans more than 90 days past due	—	—

The changes in the fair values of these mortgage loans are reported in Other revenue in the Company's Consolidated Statement of Income. There was no net change in fair value during the years ended December 31, 2018 and 2017 due to instrument-specific credit risk. Related interest income continues to be measured based on the contractual interest rates and reported as Interest revenue in the Consolidated Statement of Income.

Certain Structured Liabilities

The Company has elected the fair value option for certain structured liabilities whose performance is linked to structured interest rates, inflation, currency, equity, referenced credit or commodity risks. The Company elected the fair value option, because these exposures are considered to be trading-related positions and, therefore, are managed on a fair value basis. These positions will continue to be classified as debt, deposits or derivatives (Trading account liabilities) on the Company's Consolidated Balance Sheet according to their legal form.

The following table provides information about the carrying value of structured notes, disaggregated by type of embedded derivative instrument:

In billions of dollars	December 31, 2018	December 31, 2017
Interest rate linked	$ 17.3	$ 13.9
Foreign exchange linked	0.5	0.3
Equity linked	14.8	13.0
Commodity linked	1.2	0.2
Credit linked	1.9	1.9
Total	$ 35.7	$ 29.3

Prior to 2016, the total change in the fair value of these structured liabilities was reported in Principal transactions in the Company's Consolidated Statement of Income. Beginning in the first quarter of 2016, the portion of the changes in fair value attributable to changes in Citigroup's own credit spreads (DVA) is reflected as a component of AOCI while all other changes in fair value will continue to be reported in Principal transactions. Changes in the fair value of these structured liabilities include accrued interest, which is also included in the change in fair value reported in Principal transactions.

Certain Non-Structured Liabilities

The Company has elected the fair value option for certain non-structured liabilities with fixed and floating interest rates. The Company has elected the fair value option where the interest

rate risk of such liabilities may be economically hedged with derivative contracts or the proceeds are used to purchase financial assets that will also be accounted for at fair value through earnings. The elections have been made to mitigate accounting mismatches and to achieve operational simplifications. These positions are reported in Short-term borrowings and Long-term debt on the Company's Consolidated Balance Sheet. The portion of the changes in fair value attributable to changes in Citigroup's own credit spreads (DVA) is reflected as a component of AOCI while all other changes in fair value will continue to be reported in Principal transactions.

Interest expense on non-structured liabilities is measured based on the contractual interest rates and reported as Interest expense in the Consolidated Statement of Income.

The following table provides information about long-term debt carried at fair value:

In millions of dollars	December 31, 2018	December 31, 2017
Carrying amount reported on the Consolidated Balance Sheet	$ 38,229	$ 31,392
Aggregate unpaid principal balance in excess of (less than) fair value	3,814	(579)

The following table provides information about short-term borrowings carried at fair value:

In millions of dollars	December 31, 2018	December 31, 2017
Carrying amount reported on the Consolidated Balance Sheet	$ 4,483	$ 4,627
Aggregate unpaid principal balance in excess of (less than) fair value	861	74

26. PLEDGED ASSETS, COLLATERAL, GUARANTEES AND COMMITMENTS

Pledged Assets

In connection with Citi's financing and trading activities, Citi has pledged assets to collateralize its obligations under repurchase agreements, secured financing agreements, secured liabilities of consolidated VIEs and other borrowings. The approximate carrying values of the significant components of pledged assets recognized on Citi's Consolidated Balance Sheet included the following:

In millions of dollars	December 31, 2018	December 31, 2017
Investment securities	$148,756	$ 138,807
Loans	227,840	229,552
Trading account assets	120,292	104,360
Total	$496,888	$ 472,719

Restricted Cash

Citigroup defines restricted cash (as cash subject to withdrawal restrictions) to include cash deposited with central banks that must be maintained to meet minimum regulatory requirements, and cash set aside for the benefit of customers or for other purposes such as compensating balance arrangements or debt retirement. Restricted cash includes minimum reserve requirements with the Federal

Reserve Bank and certain other central banks and cash segregated to satisfy rules regarding the protection of customer assets as required by Citigroup broker-dealers' primary regulators, including the United States Securities and Exchange Commission (SEC), the Commodities Futures Trading Commission and the United Kingdom's Prudential Regulation Authority.

Restricted cash is included on the Consolidated Balance Sheet within the following balance sheet lines:

In millions of dollars	December 31, 2018	December 31, 2017
Cash and due from banks	$ 4,000	$ 3,151
Deposits with banks	27,208	27,664
Total	$ 31,208	$ 30,815

In addition, included in Cash and due from banks and Deposits with banks at December 31, 2018 and 2017 were $8.3 billion and $7.4 billion, respectively, of cash segregated under federal and other brokerage regulations or deposited with clearing organizations.

Collateral

At December 31, 2018 and 2017, the approximate fair value of collateral received by Citi that may be resold or repledged, excluding the impact of allowable netting, was $526.0 billion and $457.5 billion, respectively. This collateral was received in connection with resale agreements, securities borrowings and loans, securities for securities lending transactions, derivative transactions and margined broker loans.

At December 31, 2018 and 2017, a substantial portion of the collateral received by Citi had been sold or repledged in connection with repurchase agreements, securities sold, not yet purchased, securities borrowings and loans, pledges to clearing organizations, segregation requirements under securities laws and regulations, derivative transactions and bank loans.

In addition, at December 31, 2018 and 2017, Citi had pledged $373.7 billion and $363.3 billion, respectively, of collateral that may not be sold or repledged by the secured parties.

Lease Commitments

Rental expense (principally for offices, branches and computer equipment) was $1.0 billion, $1.1 billion and $1.1 billion for the years ended December 31, 2018, 2017 and 2016, respectively.

Future minimum annual rentals under non-cancelable leases, net of sublease income, are as follows:

In millions of dollars	
2019	$925
2020	748
2021	657
2022	525
2023	394
Thereafter	1,890
Total	$5,139

Guarantees

Citi provides a variety of guarantees and indemnifications to its customers to enhance their credit standing and enable them to complete a wide variety of business transactions. For certain contracts meeting the definition of a guarantee, the guarantor must recognize, at inception, a liability for the fair value of the obligation undertaken in issuing the guarantee.

In addition, the guarantor must disclose the maximum potential amount of future payments that the guarantor could be required to make under the guarantee, if there were a total default by the guaranteed parties. The determination of the maximum potential future payments is based on the notional amount of the guarantees without consideration of possible recoveries under recourse provisions or from collateral held or pledged. As such, Citi believes such amounts bear no relationship to the anticipated losses, if any, on these guarantees.

The following tables present information about Citi's guarantees:

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2018, except carrying value in millions	Expire within 1 year	Expire after 1 year	Total amount outstanding	Carrying value (in millions of dollars)
Financial standby letters of credit	$ 31.8	$ 65.3	$ 97.1	$ 131
Performance guarantees	7.7	4.2	11.9	29
Derivative instruments considered to be guarantees	23.5	87.4	110.9	567
Loans sold with recourse	—	1.2	1.2	9
Securities lending indemnifications[1]	98.3	—	98.3	—
Credit card merchant processing[1][2]	95.0	—	95.0	—
Credit card arrangements with partners	0.3	0.8	1.1	162
Custody indemnifications and other	—	35.4	35.4	41
Total	$ 256.6	$ 194.3	$ 450.9	$ 939

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2017, except carrying value in millions	Expire within 1 year	Expire after 1 year	Total amount outstanding	Carrying value (in millions of dollars)
Financial standby letters of credit	$ 27.9	$ 65.9	$ 93.8	$ 93
Performance guarantees	7.2	4.1	11.3	20
Derivative instruments considered to be guarantees	11.0	84.9	95.9	423
Loans sold with recourse	—	1.4	1.4	9
Securities lending indemnifications[1]	103.7	—	103.7	—
Credit card merchant processing[1][2]	85.5	—	85.5	—
Credit card arrangements with partners	0.3	1.1	1.4	205
Custody indemnifications and	—	36.0	36.0	59

other				
Total	$ 235.6	$ 193.4	$ 429.0	$ 809

(1) The carrying values of securities lending indemnifications and credit card merchant processing were not material for either period presented, as the probability of potential liabilities arising from these guarantees is minimal.

(2) At December 31, 2018 and 2017, this maximum potential exposure was estimated to be $95 billion and $86 billion, respectively. However, Citi believes that the maximum exposure is not representative of the actual potential loss exposure based on its historical experience. This contingent liability is unlikely to arise, as most products and services are delivered when purchased and amounts are refunded when items are returned to merchants.

Financial Standby Letters of Credit

Citi issues standby letters of credit, which substitute its own credit for that of the borrower. If a letter of credit is drawn down, the borrower is obligated to repay Citi. Standby letters of credit protect a third party from defaults on contractual obligations. Financial standby letters of credit include (i) guarantees of payment of insurance premiums and reinsurance risks that support industrial revenue bond underwriting, (ii) settlement of payment obligations to clearing houses, including futures and over-the-counter derivatives clearing (see further discussion below), (iii) support options and purchases of securities in lieu of escrow deposit accounts and (iv) letters of credit that backstop loans, credit facilities, promissory notes and trade acceptances.

Performance Guarantees

Performance guarantees and letters of credit are issued to guarantee a customer’s tender bid on a construction or systems-installation project or to guarantee completion of such projects in accordance with contract terms. They are also issued to support a customer’s obligation to supply specified products, commodities or maintenance or warranty services to a third party.

Derivative Instruments Considered to Be Guarantees

Derivatives are financial instruments whose cash flows are based on a notional amount and an underlying instrument, reference credit or index, where there is little or no initial investment, and whose terms require or permit net settlement. For a discussion of Citi’s derivatives activities, see Note 22 to the Consolidated Financial Statements. Derivative instruments considered to be guarantees include only those instruments that require Citi to make payments to the counterparty based on changes in an underlying instrument that is related to an asset, a liability or an equity security held by the guaranteed party. More specifically, derivative instruments considered to be

guarantees include certain over-the-counter written put options where the counterparty is not a bank, hedge fund or broker-dealer (such counterparties are considered to be dealers in these markets and may, therefore, not hold the underlying instruments). Credit derivatives sold by Citi are excluded from the tables above as they are disclosed separately in Note 22 to the Consolidated Financial Statements. In instances where Citi's maximum potential future payment is unlimited, the notional amount of the contract is disclosed.

Loans Sold with Recourse

Loans sold with recourse represent Citi's obligations to reimburse the buyers for loan losses under certain circumstances. Recourse refers to the clause in a sales agreement under which a seller/lender will fully reimburse the buyer/investor for any losses resulting from the purchased loans. This may be accomplished by the seller taking back any loans that become delinquent.

In addition to the amounts shown in the tables above, Citi has recorded a repurchase reserve for its potential repurchases or make-whole liability regarding residential mortgage representation and warranty claims related to its whole loan sales to the U.S. government-sponsored enterprises (GSEs) and, to a lesser extent, private investors. The repurchase reserve was approximately $49 million and $66 million at December 31, 2018 and 2017, respectively, and these amounts are included in Other liabilities on the Consolidated Balance Sheet.

Securities Lending Indemnifications

Owners of securities frequently lend those securities for a fee to other parties who may sell them short or deliver them to another party to satisfy some other obligation. Banks may administer such securities lending programs for their clients. Securities lending indemnifications are issued by the bank to guarantee that a securities lending customer will be made whole in the event that the security borrower does not return the security subject to the lending agreement and collateral held is insufficient to cover the market value of the security.

Credit Card Merchant Processing

Credit card merchant processing guarantees represent the Company's indirect obligations in connection with (i) providing transaction processing services to various merchants with respect to its private label cards and (ii) potential liability for bank card transaction processing services. The nature of the liability in either case arises as a result of a billing dispute between a merchant and a cardholder that is ultimately resolved in the cardholder's favor. The merchant is liable to refund the amount to the cardholder. In general, if the credit card processing company is unable to collect this amount from the merchant, the credit card processing company bears the loss for the amount of the credit or refund paid to the cardholder.

With regard to (i) above, Citi has the primary contingent liability with respect to its portfolio of private label merchants. The risk of loss is mitigated as the cash flows between Citi and the merchant are settled on a net basis, and

Citi has the right to offset any payments with cash flows otherwise due to the merchant. To further mitigate this risk, Citi may delay settlement, require a merchant to make an escrow deposit, include event triggers to provide Citi with more financial and operational control in the event of the financial deterioration of the merchant or require various credit enhancements (including letters of credit and bank guarantees). In the unlikely event that a private label merchant is unable to deliver products, services or a refund to its private label cardholders, Citi is contingently liable to credit or refund cardholders.

With regard to (ii) above, Citi has a potential liability for bank card transactions where Citi provides the transaction processing services as well as those where a third party provides the services and Citi acts as a secondary guarantor, should that processor fail to perform.

Citi's maximum potential contingent liability related to both bank card and private label merchant processing services is estimated to be the total volume of credit card transactions that meet the requirements to be valid charge-back transactions at any given time. At December 31, 2018 and 2017, this maximum potential exposure was estimated to be $95 billion and $86 billion, respectively.

However, Citi believes that the maximum exposure is not representative of the actual potential loss exposure based on its historical experience. This contingent liability is unlikely to arise, as most products and services are delivered when

purchased and amounts are refunded when items are returned to merchants. Citi assesses the probability and amount of its contingent liability related to merchant processing based on the financial strength of the primary guarantor, the extent and nature of unresolved charge-backs and its historical loss experience. At December 31, 2018 and 2017, the losses incurred and the carrying amounts of Citi's contingent obligations related to merchant processing activities were immaterial.

Credit Card Arrangements with Partners

Citi, in certain of its credit card partner arrangements, provides guarantees to the partner regarding the volume of certain customer originations during the term of the agreement. To the extent that such origination targets are not met, the guarantees serve to compensate the partner for certain payments that otherwise would have been generated in connection with such originations.

Custody Indemnifications

Custody indemnifications are issued to guarantee that custody clients will be made whole in the event that a third-party subcustodian or depository institution fails to safeguard clients' assets.

Other Guarantees and Indemnifications

Credit Card Protection Programs
Citi, through its credit card businesses, provides various cardholder protection programs on several of its card products, including programs that provide insurance coverage for rental cars, coverage for certain losses associated with purchased products, price protection for certain purchases and protection for lost luggage. These guarantees are not included in the table, since the total outstanding amount of the guarantees and Citi's maximum exposure to loss cannot be quantified. The protection is limited to certain types of purchases and losses, and it is not possible to quantify the purchases that would qualify for these benefits at any given time. Citi assesses the probability and amount of its potential liability related to these programs based on the extent and nature of its historical loss experience. At December 31, 2018 and 2017, the actual and estimated losses incurred and the carrying value of Citi's obligations related to these programs were immaterial.

Other Representation and Warranty Indemnifications
In the normal course of business, Citi provides standard representations and warranties to counterparties in contracts in connection with numerous transactions and also provides indemnifications, including indemnifications that protect the counterparties to the contracts in the event that additional taxes are owed, due either to a change in the tax law or an adverse interpretation of the tax law. Counterparties to these transactions provide Citi with comparable indemnifications. While such representations, warranties and indemnifications are essential components of many contractual relationships, they do not represent the underlying business purpose for the transactions. The indemnification clauses are often standard contractual terms related to Citi's own performance under the terms of a contract and are entered into in the normal course of business based on an assessment that the risk of loss is remote. Often these clauses are intended to ensure that terms of a contract are met at inception. No compensation is received for these standard representations and warranties, and it is not possible to determine their fair value because they rarely, if ever, result in a payment. In many cases, there are no stated or notional amounts included in the indemnification clauses, and the contingencies potentially triggering the obligation to indemnify have not occurred and are not expected to occur. As a result, these indemnifications are not included in the tables above.

Value-Transfer Networks (VTNs)
Citi is a member of, or shareholder in, hundreds of value-transfer networks (VTNs) (payment, clearing and settlement systems as well as exchanges) around the world. As a condition of membership, many of these VTNs require that members stand ready to pay a pro rata share of the losses incurred by the organization due to another member's default on its obligations. Citi's potential obligations may be limited to its membership interests in the VTNs, contributions to a VTN's funds, or, in limited cases, the obligation may be

unlimited. The maximum exposure cannot be estimated as this would require an assessment of future claims that have not yet occurred. Citi believes the risk of loss is remote given historical experience with the VTNs. Accordingly, Citi's participation in VTNs is not reported in the guarantees tables above, and there are no amounts reflected on the Consolidated Balance Sheet as of December 31, 2018 or 2017 for potential obligations that could arise from Citi's involvement with VTNs associations.

Long-Term Care Insurance Indemnification

In 2000, Travelers Life & Annuity (Travelers), then a subsidiary of Citi, entered into a reinsurance agreement to transfer the risks and rewards of its long-term care (LTC) business to GE Life (now Genworth Financial Inc., or Genworth), then a subsidiary of the General Electric Company (GE). As part of this transaction, the reinsurance obligations were provided by two regulated insurance subsidiaries of GE Life, which funded two collateral trusts with securities. Presently, as discussed below, the trusts are referred to as the Genworth Trusts.

As part of GE's spin-off of Genworth in 2004, GE retained the risks and rewards associated with the 2000 Travelers reinsurance agreement by providing a reinsurance contract to Genworth through its Union Fidelity Life Insurance Company (UFLIC) subsidiary that covers the Travelers LTC policies. In addition, GE provided a capital maintenance agreement in favor of UFLIC, which is designed to assure that UFLIC will have the funds to pay its reinsurance obligations. As a result of these reinsurance agreements and the spin-off of Genworth, Genworth has reinsurance protection from UFLIC (supported by GE) and has reinsurance obligations in connection with the Travelers LTC policies. As noted below, the Genworth reinsurance obligations now benefit Brighthouse Financial, Inc. (Brighthouse). While neither Brighthouse nor Citi are direct beneficiaries of the capital maintenance agreement between GE and UFLIC, Brighthouse and Citi benefit indirectly from the existence of the capital maintenance agreement, which helps assure that UFLIC will continue to have funds necessary to pay its reinsurance obligations to Genworth.

In connection with Citi's 2005 sale of Travelers to MetLife Inc. (MetLife), Citi provided an indemnification to MetLife for losses (including policyholder claims) relating to the LTC business for the entire term of the Travelers LTC policies, which, as noted above, are reinsured by subsidiaries of Genworth. In 2017, MetLife spun off its retail insurance business to Brighthouse. As a result, the Travelers LTC policies now reside with Brighthouse. The original reinsurance agreement between Travelers (now Brighthouse) and Genworth remains in place and Brighthouse is the sole beneficiary of the Genworth Trusts. The fair value of the Genworth Trusts is approximately $7.5 billion as of December 31, 2018 and 2017. The Genworth Trusts are designed to provide collateral to Brighthouse in an amount equal to the statutory liabilities of Brighthouse in respect of the Travelers LTC policies. The assets in the Genworth Trusts are evaluated and adjusted periodically to ensure that the fair value of the assets continues to provide collateral in

an amount equal to these estimated statutory liabilities, as the liabilities change over time.
If both (i) Genworth fails to perform under the original Travelers/GE Life reinsurance agreement for any reason, including insolvency or the failure of UFLIC to perform in a timely manner, and (ii) the assets of the two Genworth Trusts are insufficient or unavailable, then Citi, through its LTC reinsurance indemnification, must reimburse Brighthouse for any losses incurred in connection with the LTC policies. Since both events would have to occur before Citi would become responsible for any payment to Brighthouse pursuant to its indemnification obligation, and the likelihood of such events occurring is currently not probable, there is no liability reflected on the Consolidated Balance Sheet as of December 31, 2018 and 2017 related to this indemnification. Citi continues to closely monitor its potential exposure under this indemnification obligation.
Separately, Genworth announced that it had agreed to be purchased by China Oceanwide Holdings Co., Ltd, subject to a series of conditions and regulatory approvals. Citi is monitoring these developments.

Futures and Over-the-Counter Derivatives Clearing
Citi provides clearing services on central clearing parties (CCPs) for clients that need to clear exchange traded and over-the-counter (OTC) derivatives contracts. Based on all relevant facts and circumstances, Citi has concluded that it acts as an agent for accounting purposes in its role as clearing member for these client transactions. As such, Citi does not reflect the underlying exchange traded or OTC derivatives contracts in its Consolidated Financial Statements. See Note 22 for a discussion of Citi's derivatives activities that are reflected in its Consolidated Financial Statements.
As a clearing member, Citi collects and remits cash and securities collateral (margin) between its clients and the respective CCP. In certain circumstances, Citi collects a higher amount of cash (or securities) from its clients than it needs to remit to the CCPs. This excess cash is then held at depository institutions such as banks or carry brokers. There are two types of margin: initial and variation. Where Citi obtains benefits from or controls cash initial margin (e.g., retains an interest spread), cash initial margin collected from clients and remitted to the CCP or depository institutions is reflected within Brokerage payables (payables to customers) and Brokerage receivables (receivables from brokers, dealers and clearing organizations) or Cash and due from banks, respectively.
However, for exchange traded and OTC-cleared derivatives contracts where Citi does not obtain benefits from or control the client cash balances, the client cash initial margin collected from clients and remitted to the CCP or depository institutions is not reflected on Citi's Consolidated Balance Sheet. These conditions are met when Citi has contractually agreed with the client that (i) Citi will pass through to the client all interest paid by the CCP or depository institutions on the cash initial margin, (ii) Citi will not utilize its right as a clearing member to transform cash margin into other assets, (iii) Citi does not guarantee

and is not liable to the client for the performance of the CCP or the depository institution and (iv) the client cash balances are legally isolated from Citi's bankruptcy estate. The total amount of cash initial margin collected and remitted in this manner was approximately $13.8 billion and $10.7 billion as of December 31, 2018 and 2017, respectively.
Variation margin due from clients to the respective CCP, or from the CCP to clients, reflects changes in the value of the client's derivative contracts for each trading day. As a clearing member, Citi is exposed to the risk of non-performance by clients (e.g., failure of a client to post variation margin to the CCP for negative changes in the value of the client's derivative contracts). In the event of non-performance by a client, Citi would move to close out the client's positions. The CCP would typically utilize initial margin posted by the client and held by the CCP, with any remaining shortfalls required to be paid by Citi as clearing member. Citi generally holds incremental cash or securities margin posted by the client, which would typically be expected to be sufficient to mitigate Citi's credit risk in the event that the client fails to perform.
As required by ASC 860-30-25-5, securities collateral posted by clients is not recognized on Citi's Consolidated Balance Sheet.

Carrying Value—Guarantees and Indemnifications
At December 31, 2018 and 2017, the total carrying amounts of the liabilities related to the guarantees and indemnifications included in the tables above amounted to approximately $0.9 billion and $0.8 billion, respectively.

The carrying value of financial and performance guarantees is included in Other liabilities. For loans sold with recourse, the carrying value of the liability is included in Other liabilities.

Collateral

Cash collateral available to Citi to reimburse losses realized under these guarantees and indemnifications amounted to $55 billion and $46 billion at December 31, 2018 and 2017, respectively. Securities and other marketable assets held as collateral amounted to $55 billion and $70 billion at December 31, 2018 and 2017, respectively. The majority of collateral is held to reimburse losses realized under securities lending indemnifications. Additionally, letters of credit in favor of Citi held as collateral amounted to $4.1 billion and $3.7 billion at December 31, 2018 and 2017, respectively. Other property may also be available to Citi to cover losses under certain guarantees and indemnifications; however, the value of such property has not been determined.

Performance Risk

Citi evaluates the performance risk of its guarantees based on the assigned referenced counterparty internal or external ratings. Where external ratings are used, investment-grade ratings are considered to be Baa/BBB and above, while anything below is considered non-investment grade. Citi's internal ratings are in line with the related external rating system. On certain underlying referenced assets or entities, ratings are not available. Such referenced assets are included in the "not rated" category. The maximum potential amount of the future payments related to the outstanding guarantees is determined to be the notional amount of these contracts, which is the par amount of the assets guaranteed.

Presented in the tables below are the maximum potential amounts of future payments that are classified based upon internal and external credit ratings. As previously mentioned, the determination of the maximum potential future payments is based on the notional amount of the guarantees without consideration of possible recoveries under recourse provisions or from collateral held or pledged. As such, Citi believes such amounts bear no relationship to the anticipated losses, if any, on these guarantees.

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2018	Investment-grade	Non-investment grade	Not rated	Total
Financial standby letters of credit	$68.3	$ 11.8	$17.0	$97.1
Performance guarantees	9.2	2.1	0.6	11.9
Derivative instruments deemed to be guarantees	—	—	110.9	110.9
Loans sold with recourse	—	—	1.2	1.2
Securities lending indemnifications	—	—	98.3	98.3
Credit card merchant processing	—	—	95.0	95.0
Credit card arrangements with partners	—	—	1.1	1.1
Custody indemnifications and other	22.2	13.2	—	35.4
Total	$99.7	$ 27.1	$324.1	$450.9

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2017	Investment-grade	Non-investment grade	Not rated	Total
Financial standby letters of credit	$68.1	$ 10.9	$14.8	$93.8
Performance guarantees	7.9	2.4	1.0	11.3
Derivative instruments deemed to be guarantees	—	—	95.9	95.9
Loans sold with recourse	—	—	1.4	1.4
Securities lending indemnifications	—	—	103.7	103.7
Credit card merchant processing	—	—	85.5	85.5
Credit card arrangements with partners	—	—	1.4	1.4
Custody indemnifications and other	23.7	12.3	—	36.0
Total	$99.7	$ 25.6	$303.7	$429.0

Credit Commitments and Lines of Credit
The table below summarizes Citigroup's credit commitments:

In millions of dollars	U.S.	Outside of U.S.	December 31, 2018	December 31, 2017
Commercial and similar letters of credit	$823	$4,638	$ 5,461	$5,000
One- to four-family residential mortgages	1,056	1,615	2,671	2,674
Revolving open-end loans secured by one- to four-family residential properties	10,019	1,355	11,374	12,323
Commercial real estate, construction and land development	9,565	1,728	11,293	11,151
Credit card lines	605,857	90,150	696,007	678,300
Commercial and other consumer loan commitments	185,849	102,918	288,767	272,655
Other commitments and contingencies	2,560	761	3,321	3,071
Total	$815,729	$203,165	$ 1,018,894	$985,174

The majority of unused commitments are contingent upon customers maintaining specific credit standards. Commercial commitments generally have floating interest rates and fixed expiration dates and may require payment of fees. Such fees (net of certain direct costs) are deferred and, upon exercise of the commitment, amortized over the life of the loan or, if exercise is deemed remote, amortized over the commitment period.

Commercial and Similar Letters of Credit
A commercial letter of credit is an instrument by which Citigroup substitutes its credit for that of a customer to enable the customer to finance the purchase of goods or to incur other commitments. Citigroup issues a letter on behalf of its client to a supplier and agrees to pay the supplier upon presentation of documentary evidence that the supplier has performed in accordance with the terms of the letter of credit. When a letter of credit is drawn, the customer is then required to reimburse Citigroup.

One- to Four-Family Residential Mortgages
A one- to four-family residential mortgage commitment is a written confirmation from Citigroup to a seller of a property that the bank will advance the specified sums enabling the buyer to complete the purchase.

Revolving Open-End Loans Secured by One- to Four-Family Residential Properties
Revolving open-end loans secured by one- to four-family residential properties are essentially home equity lines of credit. A home equity line of credit is a loan secured by a primary residence or second home to the extent of the excess of fair market value over the debt outstanding for the first mortgage.

Commercial Real Estate, Construction and Land Development
Commercial real estate, construction and land development include unused portions of commitments to extend credit for the purpose of financing commercial and multifamily residential properties as well as land development projects. Both secured-by-real-estate and unsecured commitments are included in this line, as well as

undistributed loan proceeds, where there is an obligation to advance for construction progress payments. However, this line only includes those extensions of credit that, once funded, will be classified as Total loans, net on the Consolidated Balance Sheet.

Credit Card Lines
Citigroup provides credit to customers by issuing credit cards. The credit card lines are cancelable by providing notice to the cardholder or without such notice as permitted by local law.

Commercial and Other Consumer Loan Commitments

Commercial and other consumer loan commitments include overdraft and liquidity facilities as well as commercial commitments to make or purchase loans, purchase third-party receivables, provide note issuance or revolving underwriting facilities and invest in the form of equity.

Other Commitments and Contingencies

Other commitments and contingencies include committed or unsettled regular-way reverse repurchase agreements and all other transactions related to commitments and contingencies not reported on the lines above.

Unsettled Reverse Repurchase and Securities Lending Agreements and Unsettled Repurchase and Securities Borrowing Agreements

In addition, in the normal course of business, Citigroup enters into reverse repurchase and securities borrowing agreements, as well as repurchase and securities lending agreements, which settle at a future date. At December 31, 2018, and 2017, Citigroup had $36.1 billion and $35.0 billion unsettled reverse repurchase and securities borrowing agreements, respectively, and $30.7 billion and $19.1 billion unsettled repurchase and securities lending agreements, respectively. For a further discussion of securities purchased under agreements to resell and securities borrowed, and securities sold under agreements to repurchase and securities loaned, including the Company’s policy for offsetting repurchase and reverse repurchase agreements, see Note 11 to the Consolidated Financial Statements.

27. CONTINGENCIES

Accounting and Disclosure Framework

ASC 450 governs the disclosure and recognition of loss contingencies, including potential losses from litigation and regulatory matters. ASC 450 defines a “loss contingency” as “an existing condition, situation, or set of circumstances involving uncertainty as to possible loss to an entity that will ultimately be resolved when one or more future events occur or fail to occur.” It imposes different requirements for the recognition and disclosure of loss contingencies based on the likelihood of occurrence of the contingent future event or events. It distinguishes among degrees of likelihood using the following three terms: “probable,” meaning that “the future event or events are likely to occur”; “remote,” meaning that “the chance of the future event or events occurring is slight”; and “reasonably possible,” meaning that “the chance of the future event or events occurring is more than remote but less than likely.” These three terms are used below as defined in ASC 450.

Accruals. ASC 450 requires accrual for a loss contingency when it is “probable that one or more future events will occur confirming the fact of loss” and “the amount of the loss can be reasonably estimated.” In accordance with ASC 450, Citigroup establishes accruals for contingencies, including the litigation and regulatory matters disclosed herein, when Citigroup believes it is probable that a loss has been incurred and the amount of the loss can be reasonably estimated. When the reasonable estimate of the loss is within a range of amounts, the minimum amount of the range is accrued, unless some higher amount within the range is a better estimate than any other amount within the range. Once established, accruals are adjusted from time to time, as appropriate, in light of additional information. The amount of loss ultimately incurred in relation to those matters may be substantially higher or lower than the amounts accrued for those matters.

Disclosure. ASC 450 requires disclosure of a loss contingency if “there is at least a reasonable possibility that a loss or an additional loss may have been incurred” and there is no accrual for the loss because the conditions described above are not met or an exposure to loss exists in excess of the amount accrued. In accordance with ASC 450, if Citigroup has not accrued for a matter because Citigroup believes that a loss is reasonably possible but not probable, or that a loss is probable but not reasonably estimable, and the reasonably possible loss is material, it discloses the loss contingency. In addition, Citigroup discloses matters for which it has accrued if it believes a reasonably possible exposure to material loss exists in excess of the amount accrued. In accordance with ASC 450, Citigroup’s disclosure includes an estimate of the reasonably possible loss or range of loss for those matters as to which an estimate can be made. ASC 450 does not require disclosure of an estimate of the reasonably possible loss or range of loss where an estimate cannot be made. Neither accrual nor disclosure is required for losses that are deemed remote.

Litigation and Regulatory Contingencies

Overview. In addition to the matters described below, in the ordinary course of business, Citigroup, its affiliates and subsidiaries, and current and former officers, directors and employees (for purposes of this section, sometimes collectively referred to as Citigroup and Related Parties) routinely are named as defendants in, or as parties to, various legal actions and proceedings. Certain of these actions and proceedings assert claims or seek relief in connection with alleged violations of consumer protection, fair lending, securities, banking, antifraud, antitrust, anti-money laundering, employment and other statutory and common laws. Certain of these actual or threatened legal actions and proceedings include claims for substantial or indeterminate compensatory or punitive damages, or for injunctive relief, and in some instances seek recovery on a class-wide basis.

In the ordinary course of business, Citigroup and Related Parties also are subject to governmental and regulatory examinations, information-gathering requests, investigations and proceedings (both formal and informal), certain of which may result in adverse judgments, settlements, fines, penalties, restitution, disgorgement, injunctions or other relief. In addition, certain affiliates and subsidiaries of Citigroup are banks, registered broker-dealers, futures commission merchants, investment advisors or other regulated entities and, in those capacities, are subject to regulation by various U.S., state and foreign securities, banking, commodity futures, consumer protection and other regulators. In connection with formal and informal inquiries by these regulators, Citigroup and such affiliates and subsidiaries receive numerous requests, subpoenas and orders seeking documents, testimony and other information in

connection with various aspects of their regulated activities. From time to time Citigroup and Related Parties also receive grand jury subpoenas and other requests for information or assistance, formal or informal, from federal or state law enforcement agencies including, among others, various United States Attorneys' Offices, the Asset Forfeiture and Money Laundering Section and other divisions of the Department of Justice, the Financial Crimes Enforcement Network of the United States Department of the Treasury, and the Federal Bureau of Investigation relating to Citigroup and its customers.

Because of the global scope of Citigroup's operations, and its presence in countries around the world, Citigroup and Related Parties are subject to litigation and governmental and regulatory examinations, information-gathering requests, investigations and proceedings (both formal and informal) in multiple jurisdictions with legal and regulatory regimes that may differ substantially, and present substantially different risks, from those Citigroup and Related Parties are subject to in the United States. In some instances, Citigroup and Related Parties may be involved in proceedings involving the same subject matter in multiple jurisdictions, which may result in overlapping, cumulative or inconsistent outcomes.

Citigroup seeks to resolve all litigation and regulatory matters in the manner management believes is in the best interests of Citigroup and its shareholders, and contests liability, allegations of wrongdoing and, where applicable, the

amount of damages or scope of any penalties or other relief sought as appropriate in each pending matter.

Inherent Uncertainty of the Matters Disclosed. Certain of the matters disclosed below involve claims for substantial or indeterminate damages. The claims asserted in these matters typically are broad, often spanning a multi-year period and sometimes a wide range of business activities, and the plaintiffs' or claimants' alleged damages frequently are not quantified or factually supported in the complaint or statement of claim. Other matters relate to regulatory investigations or proceedings, as to which there may be no objective basis for quantifying the range of potential fine, penalty or other remedy. As a result, Citigroup is often unable to estimate the loss in such matters, even if it believes that a loss is probable or reasonably possible, until developments in the case or investigation have yielded additional information sufficient to support a quantitative assessment of the range of reasonably possible loss. Such developments may include, among other things, discovery from adverse parties or third parties, rulings by the court on key issues, analysis by retained experts and engagement in settlement negotiations. Depending on a range of factors, such as the complexity of the facts, the novelty of the legal theories, the pace of discovery, the court's scheduling order, the timing of court decisions and the adverse party's willingness to negotiate in good faith toward a resolution, it may be months or years after the filing of a case or commencement of an investigation before an estimate of the range of reasonably possible loss can be made.

Matters as to Which an Estimate Can Be Made. For some of the matters disclosed below, Citigroup is currently able to estimate a reasonably possible loss or range of loss in excess of amounts accrued (if any). For some of the matters included within this estimation, an accrual has been made because a loss is believed to be both probable and reasonably estimable, but an exposure to loss exists in excess of the amount accrued. In these cases, the estimate reflects the reasonably possible range of loss in excess of the accrued amount. For other matters included within this estimation, no accrual has been made because a loss, although estimable, is believed to be reasonably possible, but not probable; in these cases, the estimate reflects the reasonably possible loss or range of loss. As of December 31, 2018, Citigroup estimates that the reasonably possible unaccrued loss for these matters ranges up to approximately $1.0 billion in the aggregate.

These estimates are based on currently available information. As available information changes, the matters for which Citigroup is able to estimate will change, and the estimates themselves will change. In addition, while many estimates presented in financial statements and other financial disclosures involve significant judgment and may be subject to significant uncertainty, estimates of the range of reasonably possible loss arising from litigation and regulatory proceedings are subject to particular uncertainties. For example, at the time of making an estimate, (i) Citigroup may have only preliminary, incomplete, or inaccurate information about the facts underlying the claim, (ii) its assumptions about the future rulings of the court or other tribunal on significant issues, or the behavior and incentives of adverse parties or regulators, may prove to be wrong and (iii) the outcomes it is

attempting to predict are often not amenable to the use of statistical or other quantitative analytical tools. In addition, from time to time an outcome may occur that Citigroup had not accounted for in its estimate because it had deemed such an outcome to be remote. For all of these reasons, the amount of loss in excess of accruals ultimately incurred for the matters as to which an estimate has been made could be substantially higher or lower than the range of loss included in the estimate.

Matters as to Which an Estimate Cannot Be Made. For other matters disclosed below, Citigroup is not currently able to estimate the reasonably possible loss or range of loss. Many of these matters remain in very preliminary stages (even in some cases where a substantial period of time has passed since the commencement of the matter), with few or no substantive legal decisions by the court or tribunal defining the scope of the claims, the class (if any) or the potentially available damages, and fact discovery is still in progress or has not yet begun. In many of these matters, Citigroup has not yet answered the complaint or statement of claim or asserted its defenses, nor has it engaged in any negotiations with the adverse party (whether a regulator or a private party). For all these reasons, Citigroup cannot at this time estimate the reasonably possible loss or range of loss, if any, for these matters.

Opinion of Management as to Eventual Outcome. Subject to the foregoing, it is the opinion of Citigroup's management, based on current knowledge and after taking into account its current legal accruals, that the eventual outcome of all matters described in this Note would not be likely to have a material adverse effect on the consolidated financial condition of Citigroup. Nonetheless, given the substantial or indeterminate amounts sought in certain of

these matters, and the inherent unpredictability of such matters, an adverse outcome in certain of these matters could, from time to time, have a material adverse effect on Citigroup's consolidated results of operations or cash flows in particular quarterly or annual periods.

ANZ Underwriting Matter

On June 1, 2018, charges were filed by the Australian Commonwealth Director of Public Prosecutions (CDPP) against Citigroup Global Markets Australia Pty Limited (CGMA) for alleged criminal cartel offenses following a referral by the Australian Competition and Consumer Commission. CDPP alleges that the cartel conduct took place following an institutional share placement by Australia and New Zealand Banking Group Limited (ANZ) in August 2015, where CGMA acted as joint underwriter and lead manager with other banks. CDPP has also charged other banks and individuals, including current and former Citi employees. Charges relating to CGMA are captioned R v. CITIGROUP GLOBAL MARKETS AUSTRALIA PTY LIMITED (2018/00175168). The matter is before the Downing Centre Local Court in Sydney, Australia. Separately, the Australian Securities and Investments Commission is conducting an investigation, and CGMA is cooperating with the investigation.

Credit Crisis-Related Litigation and Other Matters

Citigroup and Related Parties were named as defendants in numerous legal actions and other proceedings asserting claims for damages and related relief for losses arising from the global financial credit crisis that began in 2007. Citigroup also received subpoenas and requests for information from various regulatory agencies and other government authorities concerning certain businesses impacted by the credit crisis. The vast majority of these matters have been resolved as of December 31, 2018.

Mortgage-Related Litigation and Other Matters

Mortgage-Backed Securities and CDO Investor Actions: Beginning in 2010, Citigroup and Related Parties were named as defendants in complaints filed by purchasers of mortgage-backed securities (MBS) and credit default obligations (CDOs) sold or underwritten by Citigroup. The complaints generally assert that defendants made material misrepresentations and omissions about the credit quality of the assets underlying the securities or the manner in which those assets were selected, and typically assert claims under Section 11 of the Securities Act of 1933, state blue sky laws, and/or common-law misrepresentation-based causes of action.

All but one of these matters have been resolved through motion practice or settlement. As of December 31, 2018, the aggregate original purchase amount of the purchases covered by a tolling agreement with an investor threatening litigation is approximately $500 million.

Mortgage-Backed Securities Trustee Actions: In 2014, investors in 27 residential MBS trusts for which Citibank served or currently serves as trustee filed an action in the United States District Court for the Southern District of New York, captioned FIXED INCOME SHARES: SERIES M ET AL. v. CITIBANK N.A., alleging claims that Citibank failed to pursue contractual remedies against securitization sponsors and servicers. Subsequently, all claims were dismissed as to 26 of the 27 trusts. On March 22, 2018, the court granted Citibank's motion for summary judgment and denied plaintiffs' motions for partial summary judgment and class certification, which plaintiffs have appealed. Additional information concerning this action is publicly available in court filings under the docket number 14-cv-9373 (S.D.N.Y.) (Furman, J.) and 18-1196 (2d Cir.).

In 2015, largely the same group of investors filed an action in the New York State Supreme Court, captioned FIXED INCOME SHARES: SERIES M, ET AL. v. CITIBANK N.A., related to 24 trusts initially dismissed from the federal court action and one additional trust, asserting claims similar to the action filed in federal court. In 2017, the court granted in part and denied in part Citibank's motion to dismiss plaintiffs' amended complaint. Citibank appealed as to the sustained claims, and on January 16, 2018, the New York State appeals court dismissed all of the remaining claims except the claim for breach of contract related to purported discovery of alleged underwriter breaches of representations and warranties. Additional information concerning this action is publicly available in court filings under the docket number 653891/2015 (N.Y. Sup. Ct.) (Ramos, J.).

In 2015, the Federal Deposit Insurance Corporation (FDIC), as receiver for a financial institution, filed a civil action against Citibank in the United States District Court for the Southern District of New York, captioned FEDERAL DEPOSIT INSURANCE CORPORATION AS RECEIVER FOR GUARANTY BANK v. CITIBANK N.A. The complaint concerns one residential MBS trust for which Citibank formerly served as trustee, and alleges that Citibank failed to pursue contractual remedies against the sponsor and servicers of that trust. After the court granted Citibank's motion to dismiss on grounds that the FDIC lacked standing to pursue its claims, the FDIC filed an amended complaint. In 2018, Citibank filed a motion to dismiss the amended complaint. Additional information concerning this action is publicly available in court filings under the docket number 15-cv-6574 (S.D.N.Y.) (Carter, J.).

Tribune Company Bankruptcy

Certain Citigroup affiliates (along with numerous other parties) have been named as defendants in adversary proceedings related to the Chapter 11 cases of Tribune Company (Tribune) filed in the United States Bankruptcy Court, asserting claims arising out of the approximately $11 billion leveraged buyout of Tribune in 2007. The actions were consolidated as IN RE TRIBUNE COMPANY FRAUDULENT CONVEYANCE LITIGATION and transferred to the United States District Court for the Southern District of New York.

In the adversary proceeding captioned KIRSCHNER v. FITZSIMONS, ET AL., the litigation trustee, as successor plaintiff to the Official Committee of Unsecured Creditors, seeks to avoid and recover as actual fraudulent transfers the transfers of Tribune stock that occurred as a part of the leveraged buyout. Several Citigroup affiliates, along with numerous other parties, are named as shareholder defendants and are alleged to have tendered Tribune stock to Tribune as a part of the buyout. In 2017, the United States District Court for the Southern District of New York dismissed the actual fraudulent transfer claim against the shareholder defendants, including the Citigroup affiliates.
Several Citigroup affiliates, along with numerous other parties, are named as defendants in certain actions brought by Tribune noteholders, which seek to recover the transfers of Tribune stock that occurred as a part of the leveraged buyout, as state law constructive fraudulent conveyances. The noteholders' claims were previously dismissed, which was affirmed on appeal. On May 15, 2018, the United States Court of Appeals for the Second Circuit withdrew its 2016 transfer of jurisdiction to the district court.
Citigroup Global Markets Inc. (CGMI) was named as a defendant in a separate action in connection with its role as advisor to Tribune. On January 23, 2019, the court dismissed the action. Additional information concerning these actions is publicly available in court filings under the docket numbers 08-13141 (Bankr. D. Del.) (Carey, J.), 11 MD 02296 (S.D.N.Y.) (Cote, J.), 12 MC 2296 (S.D.N.Y.) (Cote, J.), 13-3992, 13-3875, 13-4196 (2d Cir.) and 16-317 (U.S.).

Depositary Receipts Matters

Regulatory Actions: On November 7, 2018, the SEC entered an order accepting an offer of settlement from Citibank concerning the SEC's investigation into activity relating to pre-released American Depositary Receipts from 2011 to 2015. Pursuant to the settlement, Citibank paid $38.7 million in disgorgement and interest.

Other Litigation: In 2015, Citibank was sued by a purported class of persons or entities who, from January 2000 to the present, are or were holders of depositary receipts for which Citibank served as the depositary bank and converted, or caused to be converted, foreign currency dividends or other distributions into U.S. dollars. On March 23, 2018, the court granted in part and denied in part plaintiffs' motion for class certification, certifying only a class of holders of Citi-sponsored American depositary receipts that plaintiffs own. On September 6, 2018, the court granted preliminary approval of a class action settlement. On January 2, 2019, the court granted plaintiffs' request to adjourn the final approval hearing for the settlement. Additional information concerning this action is publicly available in court filings under the docket number 15 Civ. 9185 (S.D.N.Y.) (McMahon, C.).

Foreign Exchange Matters

Regulatory Actions: Government and regulatory agencies in the U.S. and in other jurisdictions are conducting investigations or making inquiries regarding Citigroup's foreign exchange business. Citigroup is fully cooperating with these and related investigations and inquiries.

Antitrust and Other Litigation: Numerous foreign exchange dealers and their affiliates, including Citigroup, Citibank, Citicorp and CGMI, were named as defendants in putative class actions consolidated in the United States District Court for the Southern District of New York under the caption IN RE FOREIGN EXCHANGE BENCHMARK RATES ANTITRUST LITIGATION. Plaintiffs allege that they suffered losses as a result of defendants' alleged manipulation of, and collusion with respect to, the foreign exchange market. Plaintiffs assert claims under the Commodity Exchange Act, Sherman Act, and Clayton Act, and seek compensatory damages, treble damages, and declaratory and injunctive relief.

On November 7, 2018, some of the institutional investors who opted out of an August 2018 settlement with Citi defendants filed a lawsuit against Citigroup, Citibank, CGMI, and other defendants under the caption ALLIANZ GLOBAL INVESTORS, ET AL. v. BANK OF AMERICA CORPORATION, ET AL. Plaintiffs allege that defendants manipulated, and colluded to manipulate, the foreign exchange market. Plaintiffs assert Sherman Act and unjust enrichment claims and seek consequential and punitive damages and other forms of relief. Additional information concerning this action is publicly available in court filings under the docket number 18 Civ. 10364 (S.D.N.Y.) (Schofield, J.).

On December 31, 2018, a group of institutional investors issued (but did not serve) a claim in the High Court in London against Citibank, Citigroup, and other defendants, alleging that defendants manipulated, and colluded to manipulate, the foreign exchange market. Claimants allege breaches of EU

and UK competition law. The case is ALLIANZ GLOBAL INVESTORS GMBH AND OTHERS v. BARCLAYS BANK PLC AND OTHERS, case number CL-2018-000840, and will not commence unless and until it is served.

In 2018, two motions for certification of class actions alleging manipulation of foreign exchange markets were filed in the Tel Aviv Central District Court in Israel against Citigroup and CGMI, and Citibank, respectively. The cases are LANUEL, ET AL. v. BANK OF AMERICA CORPORATION, ET AL., CA 29013-09-18, and GERTLER, ET AL. v. DEUTSCHE BANK AG, C1A 1657-10-18.

In 2015, an action captioned NYPL v. JPMORGAN CHASE & CO., ET AL. was brought in the United States District Court for the Northern District of California (later transferred to the United States District Court for the Southern District of New York) against Citigroup, as well as numerous other foreign exchange dealers. Subsequently, plaintiffs filed a third amended class action complaint, naming Citigroup, Citibank, and Citicorp as defendants. Plaintiffs seek to represent a putative class of "consumers and businesses in the United States who directly purchased supracompetitive foreign currency at Benchmark exchange rates" from defendants. Plaintiffs allege claims under federal and California antitrust and consumer protection laws, and are seeking compensatory damages, treble damages, and declaratory and injunctive relief. Additional information concerning this action is publicly available in court filings under the docket numbers 15 Civ. 2290 (N.D. Cal.) (Chhabria, J.) and 15 Civ. 9300 (S.D.N.Y.) (Schofield, J.).

In 2017, certain plaintiffs filed a consolidated amended complaint on behalf of purported classes of indirect purchasers of foreign exchange instruments sold by defendants, including Citigroup, Citibank, Citicorp, and CGMI as defendants, captioned CONTANT, ET AL. v. BANK OF AMERICA CORPORATION, ET AL. Plaintiffs allege that defendants engaged in a conspiracy to fix currency prices in violation of the Sherman Act and various state antitrust laws. On November 15, 2018, the court denied plaintiffs' motion for preliminary approval of a proposed class settlement with the Citi defendants and requested plaintiffs to provide additional information. Additional information concerning these actions is publicly available in court filings under the docket numbers 16 Civ. 7512 (S.D.N.Y.) (Schofield, J.), 17 Civ. 4392 (S.D.N.Y.) (Schofield, J.), and 17 Civ. 3139 (S.D.N.Y.) (Schofield, J.).

Interbank Offered Rates-Related Litigation and Other Matters

Antitrust and Other Litigation: Citigroup and Citibank, along with other U.S. Dollar (USD) LIBOR panel banks, are defendants in a multi-district litigation proceeding before the United States District Court for the Southern District of New York captioned IN RE LIBOR-BASED FINANCIAL INSTRUMENTS ANTITRUST LITIGATION. Plaintiffs, on behalf of different putative classes and individually, assert claims under the Sherman Act, the Commodities Exchange Act, and state antitrust, unfair competition, and restraint-of-trade laws, as well as various common law claims, based on allegations that defendants suppressed or otherwise

manipulated USD LIBOR. Plaintiffs seek compensatory damages, restitution, treble damages where authorized by statute, and injunctive relief.

On December 5, 2018, a court granted preliminary approval of a settlement among Citigroup, Citibank and a class of investors who purchased USD LIBOR debt securities from non-defendant sellers, pursuant to which the Citi defendants paid $7.025 million. On December 20, 2018, a court granted final approval of a settlement among Citigroup, Citibank and a class of lending institutions with interests in loans tied to USD LIBOR, pursuant to which the Citi defendants paid $23 million. Additional information concerning these actions and related actions and appeals is publicly available in court filings under the docket numbers 11 MD 2262 (S.D.N.Y.) (Buchwald, J.) and 17-1569 (2d Cir.).

In 2015, plaintiffs in the class action SULLIVAN v. BARCLAYS PLC, ET AL., pending in the United States District Court for the Southern District of New York, filed a fourth amended complaint naming Citigroup, Citibank, and various other banks as defendants. Plaintiffs claim to have suffered losses as a result of purported EURIBOR manipulation and assert claims under the Commodity Exchange Act, the Sherman Act, and the federal civil Racketeer Influenced and Corrupt Organizations (RICO) Act and for unjust enrichment. In 2017, the court granted in part and denied in part defendants' motion to dismiss. On December 19, 2018, the court preliminarily approved a settlement among the Citi and JPMorgan defendants and plaintiffs pursuant to which the settling defendants collectively agreed to pay a total of $182.5 million. Additional information concerning this action is publicly available in court filings under the docket number 13 Civ. 2811 (S.D.N.Y.) (Castel, J.).

In 2016, a putative class action captioned FRONTPOINT ASIAN EVENT DRIVEN FUND, LTD., ET AL v. CITIBANK, N.A., ET AL. was filed in the United States District Court for the Southern District of New York against Citibank, Citigroup and various other banks. Plaintiffs assert claims for violations of the Sherman Act, Clayton Act, and RICO Act, as well as state law claims for alleged manipulation of the Singapore Interbank Offered Rate and Singapore Swap Offer Rate. On May 22, 2018, the Citi defendants and plaintiffs entered into a settlement under which Citi agreed to pay $9.99 million. Additional information concerning this action is publicly available in court filings under the docket number 16 Civ. 5263 (S.D.N.Y.) (Hellerstein, J.).

In 2016, Banque Delubac filed a summons against Citigroup, Citigroup Global Markets Limited (CGML), and Citigroup Europe Plc with the Commercial Court of Aubenas, France, alleging that defendants suppressed LIBOR submissions between 2005 and 2012, and that Banque Delubac's EURIBOR-linked lending activity was negatively impacted as a result. Plaintiff is seeking compensatory damages for losses on LIBOR-linked loans to customers and for alleged consequential losses to its business. On November 6, 2018, the Aubenas Court found that it lacked subject matter jurisdiction and transferred the case to the Commercial Court of Marseille. An appeal on jurisdiction is pending before the Court of Appeal of Nîmes. Proceedings before the Commercial Court of Marseille are stayed pending the appeal.

The case is SCS BANQUE DELUBAC & CIE v. CITIGROUP INC. ET AL., Commercial Court of Marseille, RG no. 2018F02750.

On January 15, 2019, a putative class action captioned PUTNAM BANK v. INTERCONTINENTAL EXCHANGE, INC., ET AL., was filed in the United States District Court for the Southern District of New York against the Intercontinental Exchange, Inc. (ICE), Citigroup, Citibank, CGMI, and various other banks. Plaintiff asserts claims for violations of the Sherman Act and Clayton Act and unjust enrichment based on alleged suppression of the ICE LIBOR and seeks compensatory damages, disgorgement and treble damages where authorized by statute. Additional information relating to this action is publicly available in court filings under the docket number 19-cv-00439 (S.D.N.Y.) (Marrero, J.).

Interchange Fee Litigation

Beginning in 2005, several putative class actions were filed against Citigroup and Related Parties, together with Visa, MasterCard and other banks and their affiliates, in various federal district courts and consolidated with other related individual cases in a multi-district litigation proceeding in the United States District Court for the Eastern District of New York. This proceeding is captioned IN RE PAYMENT CARD INTERCHANGE FEE AND MERCHANT DISCOUNT ANTITRUST LITIGATION.

The plaintiffs, merchants that accept Visa and MasterCard branded payment cards as well as membership associations that claim to represent certain groups of merchants, allege, among other things, that defendants have engaged in conspiracies to set the price of interchange and merchant discount fees on credit and debit card transactions and to restrain trade unreasonably through various Visa and MasterCard rules governing merchant conduct, all in violation of Section 1 of the Sherman Act and certain California statutes. Plaintiffs further alleged violations of Section 2 of the Sherman Act. Supplemental complaints also were filed against defendants in the putative class actions alleging that Visa's and MasterCard's respective initial public offerings were anticompetitive and violated Section 7 of the Clayton Act, and that MasterCard's initial public offering constituted a fraudulent conveyance.

In 2014, the district court entered a final judgment approving the terms of a class settlement providing for, among other things, a total payment to the class of $6.05 billion; a rebate to merchants participating in the damages class settlement of 10 bps on interchange collected for a period of eight months by the Visa and MasterCard networks; and changes to certain network rules. Various objectors appealed from the final class settlement approval order to the United States Court of Appeals for the Second Circuit.

In 2016, the Court of Appeals reversed the district court's approval of the class settlement and remanded for further proceedings. The district court thereafter appointed separate interim counsel for a putative class seeking damages and a putative class seeking injunctive relief. Amended or new complaints on behalf of the putative classes and various individual merchants were subsequently filed, including a further amended complaint on behalf of a putative damages

class and a new complaint on behalf of a putative injunctive class, both of which named Citigroup and affiliates. In addition, numerous merchants have filed amended or new complaints against Visa, MasterCard, and in some instances one or more issuing banks. Three of these suits—7-ELEVEN, INC., ET AL. v. VISA INC., ET AL.; ROUNDY'S SUPERMARKETS, INC. v. VISA INC. ET AL.; and LUBY'S FUDDRUCKERS RESTAURANTS, LLC, v. VISA INC., ET AL—brought on behalf of numerous individual merchants, name Citigroup and affiliates as defendants. On January 24, 2019, the court granted the damages class plaintiffs' motion for preliminary approval of a settlement with the defendants, including Citigroup. The settlement involves the damages class only and does not settle the claims of the injunctive relief class or any actions brought on a non-class basis by individual merchants. Additional information concerning these consolidated actions is publicly available in court filings under the docket number MDL 05-1720 (E.D.N.Y.) (Brodie, J.).

Interest Rate Swaps Matters

Regulatory Actions: The Commodity Futures Trading Commission (CFTC) is conducting an investigation into alleged anticompetitive conduct in the trading and clearing of interest rate swaps (IRS) by investment banks. Citigroup is cooperating with the investigation.

Antitrust and Other Litigation: Beginning in 2015, IRS market participants, including Citigroup, Citibank, CGMI, CGML and numerous other parties, were named as defendants in a number of industry-wide putative class actions. These actions have been consolidated in the United States District Court for the Southern District of New York under the caption IN RE INTEREST RATE SWAPS ANTITRUST LITIGATION. Plaintiffs in these actions allege that defendants colluded to prevent the development of exchange-like trading for IRS, thereby causing the putative classes to suffer losses in connection with their IRS transactions. Plaintiffs assert federal antitrust claims and claims for unjust enrichment. Also consolidated under the same caption are two individual actions filed by swap execution facilities, asserting federal and state antitrust claims as well as claims for unjust enrichment and tortious interference with business relations. Plaintiffs in all of these actions seek treble damages, fees, costs and injunctive relief. On October 25, 2018, the putative class plaintiffs moved for leave to file a fourth consolidated class action complaint. On November 20, 2018, the district court granted in part and denied in part defendants' motion to dismiss in TRUEEX LLC v. BANK OF AMERICA CORPORATION, ET AL. Additional information concerning these actions is publicly available in court filings under the docket numbers 18-CV-5361 (S.D.N.Y.) (Engelmayer, J.) and 16-MD-2704 (S.D.N.Y.) (Engelmayer, J.).

Money Laundering Inquiries

Regulatory Actions: Citibank has received subpoenas from the United States Attorney for the Eastern District of New York in connection with its investigation of alleged bribery, corruption and money laundering associated with the Fédération Internationale de Football Association (FIFA), and the

potential involvement of financial institutions in that activity. The subpoenas request information relating to, among other things, banking relationships and transactions at Citibank and its affiliates associated with certain individuals and entities identified as having had involvement with the alleged corrupt conduct. Citi is cooperating with the authorities in this matter.

Oceanografía Fraud and Related Matters

Regulatory Actions: On August 16, 2018, Citi resolved an SEC investigation into Citigroup's announcement in the first quarter of 2014 of a fraud discovered in a Petróleos

Mexicanos (Pemex) supplier program involving Oceanografía S.A. de C.V. (OSA), a Mexican oil services company and a key supplier to Pemex. As part of the resolution, Citi agreed to pay a civil penalty of $4.75 million.

Other Litigation: In 2016, a complaint was filed against Citigroup in the United States District Court for the Southern District of Florida alleging that it conspired with OSA and others with respect to receivable financings and other financing arrangements related to OSA in a manner that injured bondholders and other creditors of OSA. The complaint asserts claims on behalf of 39 plaintiffs that are characterized variously as trade creditors of, investors in, or lenders to OSA. Plaintiffs collectively claim to have lost $1.1 billion as a result of OSA's bankruptcy. The complaint

asserts claims under the federal civil RICO law and seeks treble damages and other relief pursuant to that statute. The complaint also asserts claims for fraud and breach of fiduciary duty.

Subsequently, plaintiffs filed an amended complaint adding common law claims for fraud, aiding and abetting fraud, and conspiracy on behalf of all plaintiffs. On January 30, 2018, the court granted Citigroup's motion to dismiss the amended complaint, which plaintiffs appealed. Additional information concerning this action is publicly available in court filings under the docket number 16-20725 (S.D. Fla.) (Gayles, J.).

In 2017, a complaint was filed against Citigroup in the United States District Court for the Southern District of New York by OSA and its controlling shareholder, Amado Yáñez Osuna. The complaint alleges that plaintiffs were injured when Citigroup made certain public statements about receivable financings and other financing arrangements related to OSA. The complaint asserts claims for malicious prosecution and tortious interference with existing and prospective business relationships. Plaintiffs later filed an amended complaint adding CGMI, Citibank and Banco Nacional de México, or Banamex, as defendants and adding causes of action for fraud and breach of contract. On September 28, 2018, the court granted defendants motion to dismiss, which plaintiffs have appealed. Additional information concerning this action is publicly available in court filings under the docket number 1:17-cv-01434 (S.D.N.Y.) (Sullivan, J.).

Parmalat Litigation

In 2004, an Italian commissioner appointed to oversee the administration of various Parmalat companies, filed a complaint against Citigroup and Related Parties alleging that

the defendants facilitated a number of frauds by Parmalat insiders. In 2008, a jury rendered a verdict in Citigroup's favor and awarded Citi $431 million. Citigroup has taken steps to enforce the judgment in Italian court. In 2014, an Italian court of appeal affirmed the decision in the full amount of $431 million, which Parmalat has appealed to the Italian Supreme Court. Additional information concerning this action is publicly available in court filings under the docket number 27618/2014.

In 2015, Parmalat filed a claim in an Italian civil court in Milan claiming damages of €1.8 billion against Citigroup and Related Parties. On January 25, 2018, the Milan court dismissed Parmalat's claim on grounds that it was duplicative of Parmalat's previously unsuccessful claims. On March 2, 2018, Parmalat filed an appeal to the Milan Court of Appeal. Additional information concerning this action is publicly available in court filings under the docket number 1009/2018.

Referral Hiring Practices Investigations

Government and regulatory agencies in the U.S., including the SEC, are conducting investigations or making inquiries concerning compliance with the Foreign Corrupt Practices Act and other laws with respect to the hiring of candidates referred by or related to foreign government officials. Citigroup is cooperating with the investigations and inquiries.

Sovereign Securities Matters

Regulatory Actions: Government and regulatory agencies in the United States and in other jurisdictions are conducting investigations or making inquiries regarding Citigroup's sales and trading activities in connection with sovereign and other government-related securities. Citigroup is fully cooperating with these investigations and inquiries.

Antitrust and Other Litigation: Beginning in 2015, CGMI and numerous other U.S. Treasury primary dealer banks were named as defendants in a number of substantially similar putative class actions involving allegations that they colluded to manipulate U.S. Treasury securities markets. The cases were later consolidated in the United States District Court for the Southern District of New York. Plaintiffs then filed a consolidated complaint, which alleges that CGMI and other primary dealer defendants colluded to fix Treasury auction bids by sharing competitively sensitive information ahead of the auctions, in violation of the antitrust laws. The consolidated complaint also alleges that CGMI and other primary dealer defendants colluded to boycott and prevent the emergence of an anonymous, all-to-all electronic trading platform in the Treasuries secondary market, and seeks damages, including treble damages where authorized by statute, and injunctive relief. Defendants filed motions to dismiss on February 23, 2018. Additional information relating to this action is publicly available in court filings under the docket number 15-MD-2673 (S.D.N.Y.) (Gardephe, J.).

Beginning in 2016, a number of substantially similar putative class action complaints were filed against a number of financial institutions and traders related to the supranational, sub-sovereign, and agency (SSA) bond market. The actions are based upon defendants' roles as market makers and traders of SSA bonds and assert claims of alleged collusion under the

antitrust laws and unjust enrichment and seek damages, including treble damages where authorized by statute, and disgorgement. These actions were later consolidated in the United States District Court for the Southern District of New York. Subsequently, plaintiffs filed a consolidated complaint that names Citigroup, Citibank, CGMI and CGML among the defendants. Plaintiffs filed a second amended consolidated complaint on November 6, 2018, which defendants moved to dismiss. Additional information relating to this action is publicly available in court filings under the docket number 16-cv-03711 (S.D.N.Y.) (Ramos, J.).

In 2017, a class action related to the SSA bond market was filed in the Ontario Court of Justice against Citigroup, Citibank, CGMI, CGML, Citibank Canada and Citigroup Global Markets Canada, Inc., among other defendants, asserting claims for breach of contract, breach of the competition act, breach of foreign law, unjust enrichment, and civil conspiracy. Plaintiffs seek compensatory and punitive damages, as well as declaratory relief. Additional information relating to this action is publicly available in court filings under the docket number CV-17-586082-00CP (Ont. S.C.J.).

Also in 2017, a second similar action was initiated in Canadian Federal Court by the same law firm against the same Citi entities as the Ontario action, in addition to other defendants. The action asserts claims for breach of the competition act and breach of foreign law. Additional information relating to this action is publicly available in court filings under the docket number T-1871-17 (Fed. Ct.).

Beginning in March 2018, six complaints (later consolidated) were filed in the United States District Court for the Southern District of New York against numerous defendants, including Citigroup, CGMI, Citigroup Financial Products Inc., Citigroup Global Markets Holdings Inc., Citibanamex, and Grupo Banamex, related to the Mexican sovereign bond market. The complaints allege a conspiracy to fix prices in the Mexican sovereign bond market from January 1, 2006 to April 19, 2017, and assert antitrust and unjust enrichment claims against the Citi defendants, as well as a number of other banks. Plaintiffs seek statutory treble damages, restitution, and injunctive relief. Defendants moved to dismiss the consolidated amended complaint. Additional information relating to this consolidated action is publicly available in court filings under the docket number 18 Civ. 2830 (S.D.N.Y.) (Oetken, J.).

Settlement Payments

Payments required in settlement agreements described above have been made or are covered by existing litigation accruals.

28. CONDENSED CONSOLIDATING FINANCIAL STATEMENTS

Citigroup amended its Registration Statement on Form S-3 on file with the SEC (File No. 33-192302) to add its wholly owned subsidiary, Citigroup Global Markets Holdings Inc. (CGMHI), as a co-registrant. Any securities issued by CGMHI under the Form S-3 will be fully and unconditionally guaranteed by Citigroup.

The following are the Condensed Consolidating Statements of Income and Comprehensive Income for the years ended December 31, 2018, 2017 and 2016, Condensed Consolidating Balance Sheet as of December 31, 2018 and 2017 and Condensed Consolidating Statement of Cash Flows for the years ended December 31, 2018, 2017 and 2016 for Citigroup Inc., the parent holding company (Citigroup parent company), CGMHI, other Citigroup subsidiaries and eliminations and total consolidating adjustments. “Other Citigroup subsidiaries and eliminations” includes all other subsidiaries of Citigroup, intercompany eliminations and income (loss) from discontinued operations. “Consolidating adjustments” includes Citigroup parent company elimination of distributed and undistributed income of subsidiaries and investment in subsidiaries.

These Condensed Consolidating Financial Statements have been prepared and presented in accordance with SEC Regulation S-X Rule 3-10, “Financial Statements of Guarantors and Issuers of Guaranteed Securities Registered or Being Registered.”

These Condensed Consolidating Financial Statements schedules are presented for purposes of additional analysis, but should be considered in relation to the Consolidated Financial Statements of Citigroup taken as a whole.

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Condensed Consolidating Statements of Income and Comprehensive Income

	Year ended December 31, 2018				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$22,854	$—	$ —	$ (22,854)	$ —
Interest revenue	67	8,732	62,029	—	70,828
Interest revenue—intercompany	4,933	1,659	(6,592)	—	—
Interest expense	4,783	5,430	14,053	—	24,266
Interest expense—intercompany	1,198	3,539	(4,737)	—	—
Net interest revenue	$(981)	$1,422	$ 46,121	$ —	$ 46,562
Commissions and fees	$—	$5,146	$ 6,711	$ —	$ 11,857
Commissions and fees—intercompany	(2)	237	(235)	—	—
Principal transactions	(1,310)	1,599	8,773	—	9,062
Principal transactions—intercompany	(929)	1,328	(399)	—	—
Other income	1,373	710	3,290	—	5,373
Other income—intercompany	(107)	143	(36)	—	—
Total non-interest revenues	$(975)	$9,163	$ 18,104	$ —	$ 26,292
Total revenues, net of interest expense	$20,898	$10,585	$ 64,225	$ (22,854)	$ 72,854
Provisions for credit losses and for benefits and claims	$—	$(22)	$ 7,590	$ —	$ 7,568
Operating expenses					
Compensation and benefits	$4	$4,484	$ 16,666	$ —	$ 21,154
Compensation and benefits—intercompany	115	—	(115)	—	—
Other operating	(192)	2,224	18,655	—	20,687
Other operating—intercompany	49	2,312	(2,361)	—	—
Total operating expenses	$(24)	$9,020	$ 32,845	$ —	$ 41,841
Equity in undistributed income of subsidiaries	$(2,163)	$—	$ —	$ 2,163	$ —
Income (loss) from continuing operations before income taxes	$18,759	$1,587	$ 23,790	$ (20,691)	$ 23,445
Provision for income taxes	$714	$1,123	$ 3,520	$ —	$ 5,357
Income (loss) from continuing operations	$18,045	$464	$ 20,270	$ (20,691)	$ 18,088
Loss from discontinued operations, net of taxes	—	—	(8)	—	(8)
Net income (loss) before attribution of noncontrolling interests	$18,045	$464	$ 20,262	$ (20,691)	$ 18,080
Noncontrolling interests	—	—	35	—	35
Net income (loss)	$18,045	$464	$ 20,227	$ (20,691)	$ 18,045
Comprehensive income					
Add: Other comprehensive income (loss)	$(2,499)	$257	$ 3,500	$ (3,757)	$ (2,499)
Total Citigroup comprehensive income (loss)	$15,546	$721	$ 23,727	$ (24,448)	$ 15,546
Add: Other comprehensive income (loss) attributable to noncontrolling interests	$—	$—	$ (43)	$ —	$ (43)
Add: Net income attributable to noncontrolling interests	—	—	35	—	35
Total comprehensive income (loss)	$15,546	$721	$ 23,719	$ (24,448)	$ 15,538

Condensed Consolidating Statements of Income and Comprehensive Income

	Year ended December 31, 2017				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$22,499	$—	$ —	$ (22,499)	$ —
Interest revenue	1	5,279	56,299	—	61,579
Interest revenue—intercompany	3,972	1,178	(5,150)	—	—
Interest expense	4,766	2,340	9,412	—	16,518
Interest expense—intercompany	829	2,297	(3,126)	—	—
Net interest revenue	$(1,622)	$1,820	$ 44,863	$ —	$ 45,061
Commissions and fees	$—	$5,366	$ 7,341	$ —	$ 12,707
Commissions and fees—intercompany	(2)	182	(180)	—	—
Principal transactions	1,654	1,183	6,638	—	9,475
Principal transactions—intercompany	934	1,200	(2,134)	—	—
Other income	(2,581)	867	6,915	—	5,201
Other income—intercompany	5	170	(175)	—	—
Total non-interest revenues	$10	$8,968	$ 18,405	$ —	$ 27,383
Total revenues, net of interest expense	$20,887	$10,788	$ 63,268	$ (22,499)	$ 72,444
Provisions for credit losses and for benefits and claims	$—	$—	$ 7,451	$ —	$ 7,451
Operating expenses					
Compensation and benefits	$(107)	$4,403	$ 16,885	$ —	$ 21,181
Compensation and benefits—intercompany	120	—	(120)	—	—
Other operating	(318)	2,184	19,185	—	21,051
Other operating—intercompany	(35)	2,231	(2,196)	—	—
Total operating expenses	$(340)	$8,818	$ 33,754	$ —	$ 42,232
Equity in undistributed income of subsidiaries	$(19,088)	$—	$ —	$ 19,088	$ —
Income (loss) from continuing operations before income taxes	$2,139	$1,970	$ 22,063	$ (3,411)	$ 22,761
Provision for income taxes	$8,937	$873	$ 19,578	$ —	$ 29,388
Income (loss) from continuing operations	$(6,798)	$1,097	$ 2,485	$ (3,411)	$ (6,627)
Loss from discontinued operations, net of taxes	—	—	(111)	—	(111)
Net income (loss) before attribution of noncontrolling interests	$(6,798)	$1,097	$ 2,374	$ (3,411)	$ (6,738)
Noncontrolling interests	—	(1)	61	—	60
Net income (loss)	$(6,798)	$1,098	$ 2,313	$ (3,411)	$ (6,798)
Comprehensive income					
Add: Other comprehensive income (loss)	$(2,791)	$(117)	$ (4,160)	$ 4,277	$ (2,791)
Total Citigroup comprehensive income (loss)	$(9,589)	$981	$ (1,847)	$ 866	$ (9,589)
Add: Other comprehensive income (loss) attributable to noncontrolling interests	$—	$—	$ 114	$ —	$ 114
Add: Net income attributable to noncontrolling interests	—	(1)	61	—	60
Total comprehensive income (loss)	$(9,589)	$980	$ (1,672)	$ 866	$ (9,415)

Condensed Consolidating Statements of Income and Comprehensive Income

	Year ended December 31, 2016				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$15,570	$—	$ —	$ (15,570)	$ —
Interest revenue	7	4,590	53,391	—	57,988
Interest revenue—intercompany	3,008	545	(3,553)	—	—
Interest expense	4,419	1,418	6,675	—	12,512
Interest expense—intercompany	209	1,659	(1,868)	—	—
Net interest revenue	$(1,613)	$2,058	$ 45,031	$ —	$ 45,476
Commissions and fees	$—	$4,536	$ 7,142	$ —	$ 11,678
Commissions and fees—intercompany	(20)	246	(226)	—	—
Principal transactions	(1,025)	5,718	3,164	—	7,857
Principal transactions—intercompany	24	(2,842)	2,818	—	—
Other income	2,599	191	2,996	—	5,786
Other income—intercompany	(2,095)	306	1,789	—	—
Total non-interest revenues	$(517)	$8,155	$ 17,683	$ —	$ 25,321
Total revenues, net of interest expense	$13,440	$10,213	$ 62,714	$ (15,570)	$ 70,797
Provisions for credit losses and for benefits and claims	$—	$—	$ 6,982	$ —	$ 6,982
Operating expenses					
Compensation and benefits	$22	$4,719	$ 16,229	$ —	$ 20,970
Compensation and benefits—intercompany	36	—	(36)	—	—
Other operating	482	1,983	18,903	—	21,368
Other operating—intercompany	217	1,335	(1,552)	—	—
Total operating expenses	$757	$8,037	$ 33,544	$ —	$ 42,338
Equity in undistributed income of subsidiaries	$871	$—	$ —	$ (871)	$ —
Income (loss) from continuing operations before income taxes	$13,554	$2,176	$ 22,188	$ (16,441)	$ 21,477
Provision (benefit) for income taxes	$(1,358)	$746	$ 7,056	$ —	$ 6,444
Income (loss) from continuing operations	$14,912	$1,430	$ 15,132	$ (16,441)	$ 15,033
Loss from discontinued operations, net of taxes	—	—	(58)	—	(58)
Net income (loss) before attribution of noncontrolling interests	$14,912	$1,430	$ 15,074	$ (16,441)	$ 14,975
Noncontrolling interests	—	(13)	76	—	63
Net income (loss)	$14,912	$1,443	$ 14,998	$ (16,441)	$ 14,912
Comprehensive income					
Add: Other comprehensive income (loss)	$(3,022)	$(26)	$ 2,364	$ (2,338)	$ (3,022)
Total Citigroup comprehensive income (loss)	$11,890	$1,417	$ 17,362	$ (18,779)	$ 11,890
Add: Other comprehensive income (loss) attributable to noncontrolling interests	$—	$—	$ (56)	$ —	$ (56)
Add: Net income attributable to noncontrolling interests	—	(13)	76	—	63
Total comprehensive income (loss)	$11,890	$1,404	$ 17,382	$ (18,779)	$ 11,897

Condensed Consolidating Balance Sheet

	December 31, 2018				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Assets					
Cash and due from banks	$1	$689	$22,955	$—	$23,645
Cash and due from banks—intercompany	19	3,545	(3,564)	—	—
Deposits with banks	—	4,915	159,545	—	164,460
Deposits with banks—intercompany	3,000	6,528	(9,528)	—	—
Federal funds sold and resale agreements	—	212,720	57,964	—	270,684
Federal funds sold and resale agreements—intercompany	—	20,074	(20,074)	—	—
Trading account assets	302	146,233	109,582	—	256,117
Trading account assets—intercompany	627	1,728	(2,355)	—	—
Investments	7	224	358,376	—	358,607
Loans, net of unearned income	—	1,292	682,904	—	684,196
Loans, net of unearned income—intercompany	—	—	—	—	—
Allowance for loan losses	—	—	(12,315)	—	(12,315)
Total loans, net	$—	$1,292	$670,589	$—	$671,881
Advances to subsidiaries	$143,119	$—	$(143,119)	$—	$—
Investments in subsidiaries	205,337	—	—	(205,337)	—
Other assets[1]	9,861	59,734	102,394	—	171,989
Other assets—intercompany	3,037	44,255	(47,292)	—	—
Total assets	$365,310	$501,937	$1,255,473	$(205,337)	$1,917,383
Liabilities and equity					
Deposits	$—	$—	$1,013,170	$—	$1,013,170
Deposits—intercompany	—	—	—	—	—
Federal funds purchased and securities loaned and sold	—	155,830	21,938	—	177,768
Federal funds purchased and securities loaned and sold—intercompany	—	21,109	(21,109)	—	—
Trading account liabilities	1	95,571	48,733	—	144,305
Trading account liabilities—intercompany	410	1,398	(1,808)	—	—
Short-term borrowings	207	3,656	28,483	—	32,346
Short-term borrowings—intercompany	—	11,343	(11,343)	—	—
Long-term debt	143,768	25,986	62,245	—	231,999
Long-term debt—intercompany	—	73,884	(73,884)	—	—
Advances from subsidiaries	21,471	—	(21,471)	—	—
Other liabilities	3,010	66,732	50,979	—	120,721
Other liabilities—intercompany	223	13,763	(13,986)	—	—
Stockholders' equity	196,220	32,665	173,526	(205,337)	197,074
Total liabilities and equity	$365,310	$501,937	$1,255,473	$(205,337)	$1,917,383

(1) Other assets for Citigroup parent company at December 31, 2018 included $34.7 billion of placements to Citibank and its branches, of which $22.4 billion had a remaining term of less than 30 days.

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Condensed Consolidating Balance Sheet

	December 31, 2017				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Assets					
Cash and due from banks	$—	$378	$23,397	$—	$23,775
Cash and due from banks—intercompany	13	3,750	(3,763)	—	—
Deposits with banks	—	3,348	153,393	—	156,741
Deposits with banks—intercompany	11,000	5,219	(16,219)	—	—
Federal funds sold and resale agreements	—	182,685	49,793	—	232,478
Federal funds sold and resale agreements—intercompany	—	16,091	(16,091)	—	—
Trading account assets	—	139,462	113,328	—	252,790
Trading account assets—intercompany	38	2,711	(2,749)	—	—
Investments	27	181	352,082	—	352,290
Loans, net of unearned income	—	900	666,134	—	667,034
Loans, net of unearned income—intercompany	—	—	—	—	—
Allowance for loan losses	—	—	(12,355)	—	(12,355)
Total loans, net	$—	$900	$653,779	$—	$654,679
Advances to subsidiaries	$139,722	$—	$(139,722)	$—	$—
Investments in subsidiaries	210,537	—	—	(210,537)	—
Other assets[1]	10,844	58,299	100,569	—	169,712
Other assets—intercompany	3,428	43,613	(47,041)	—	—
Total assets	$375,609	$456,637	$1,220,756	$(210,537)	$1,842,465
Liabilities and equity					
Deposits	$—	$—	$959,822	$—	$959,822
Deposits—intercompany	—	—	—	—	—
Federal funds purchased and securities loaned and sold	—	134,888	21,389	—	156,277
Federal funds purchased and securities loaned and sold—intercompany	—	18,597	(18,597)	—	—
Trading account liabilities	—	80,801	44,369	—	125,170
Trading account liabilities—intercompany	15	2,182	(2,197)	—	—
Short-term borrowings	251	3,568	40,633	—	44,452
Short-term borrowings—intercompany	—	32,871	(32,871)	—	—
Long-term debt	152,163	18,048	66,498	—	236,709
Long-term debt—intercompany	—	60,765	(60,765)	—	—
Advances from subsidiaries	19,136	—	(19,136)	—	—
Other liabilities	2,673	62,113	53,577	—	118,363
Other liabilities—intercompany	631	9,753	(10,384)	—	—
Stockholders' equity	200,740	33,051	178,418	(210,537)	201,672
Total liabilities and equity	$375,609	$456,637	$1,220,756	$(210,537)	$1,842,465

(1) Other assets for Citigroup parent company at December 31, 2017 included $29.7 billion of placements to Citibank and its branches, of which $18.9 billion had a remaining term of less than 30 days.

Condensed Consolidating Statement of Cash Flows

	Year ended December 31, 2018				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by operating activities of continuing operations	$21,314	$13,287	$2,351	$—	$36,952
Cash flows from investing activities of continuing operations					
Purchases of investments	$(7,955)	$(18)	$(179,014)	$—	$(186,987)
Proceeds from sales of investments	7,634	3	53,854	—	61,491
Proceeds from maturities of investments	—	—	118,104	—	118,104
Change in loans	—	—	(29,002)	—	(29,002)
Proceeds from sales and securitizations of loans	—	—	4,549	—	4,549
Proceeds from significant disposals	—	—	314	—	314
Change in federal funds sold and resales	—	(34,018)	(4,188)	—	(38,206)
Changes in investments and advances—intercompany	(5,566)	(832)	6,398	—	—
Other investing activities	556	(59)	(3,878)	—	(3,381)
Net cash used in investing activities of continuing operations	$(5,331)	$(34,924)	$(32,863)	$—	$(73,118)
Cash flows from financing activities of continuing operations					
Dividends paid	$(5,020)	$—	$—	$—	$(5,020)
Redemption of preferred stock	(793)	—	—	—	(793)
Treasury stock acquired	(14,433)	—	—	—	(14,433)
Proceeds (repayments) from issuance of long-term debt, net	(5,099)	10,278	(2,656)	—	2,523
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	10,708	(10,708)	—	—
Change in deposits	—	—	53,348	—	53,348
Change in federal funds purchased and repos	—	23,454	(1,963)	—	21,491
Change in short-term borrowings	32	88	(12,226)	—	(12,106)
Net change in short-term borrowings and other advances—intercompany	1,819	(19,111)	17,292	—	—
Capital contributions from parent	—	(798)	798	—	—
Other financing activities	(482)	—	—	—	(482)
Net cash provided by (used in) financing activities of continuing operations	$(23,976)	$24,619	$43,885	$—	$44,528
Effect of exchange rate changes on cash and due from banks	$—	$—	$(773)	$—	$(773)
Change in cash and due from banks and deposits with banks	$(7,993)	$2,982	$12,600	$—	$7,589
Cash and due from banks and deposits with banks at beginning of period	11,013	12,695	156,808	—	180,516
Cash and due from banks and deposits with banks at end of period	$3,020	$15,677	$169,408	$—	$188,105
Cash and due from banks	$20	$4,234	$19,391	$—	$23,645
Deposits with banks	3,000	11,443	150,017	—	164,460

Cash and due from banks and deposits with banks at end of period	$3,020	$15,677	$169,408	$ —	$188,105
Supplemental disclosure of cash flow information for continuing operations					
Cash paid during the year for income taxes	$(783)	$458	$4,638	$ —	$4,313
Cash paid during the year for interest	3,854	8,671	10,438	—	22,963
Non-cash investing activities					
Transfers to loans HFS from loans	$—	$—	$4,200	$ —	$4,200
Transfers to OREO and other repossessed assets	—	—	151	—	151

Condensed Consolidating Statement of Cash Flows

	Year ended December 31, 2017				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by (used in) operating activities of continuing operations	$25,270	$(33,365)	$(679)	$—	$(8,774)
Cash flows from investing activities of continuing operations					
Purchases of investments	$—	$(14)	$(185,726)	$—	$(185,740)
Proceeds from sales of investments	132	18	107,218	—	107,368
Proceeds from maturities of investments	—	—	84,369	—	84,369
Change in loans	—	—	(58,062)	—	(58,062)
Proceeds from sales and securitizations of loans	—	—	8,365	—	8,365
Proceeds from significant disposals	—	—	3,411	—	3,411
Change in federal funds sold and resales	—	9,731	(5,396)	—	4,335
Changes in investments and advances—intercompany	(899)	9,755	(8,856)	—	—
Other investing activities	—	(24)	(2,773)	—	(2,797)
Net cash provided by (used in) investing activities of continuing operations	$(767)	$19,466	$(57,450)	$—	$(38,751)
Cash flows from financing activities of continuing operations					
Dividends paid	$(3,797)	$—	$—	$—	$(3,797)
Issuance of preferred stock	—	—	—	—	—
Treasury stock acquired	(14,541)	—	—	—	(14,541)
Proceeds (repayments) from issuance of long-term debt, net	6,544	4,909	15,521	—	26,974
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	(2,031)	2,031	—	—
Change in deposits	—	—	30,416	—	30,416
Change in federal funds purchased and repos	—	5,748	8,708	—	14,456
Change in short-term borrowings	49	2,212	11,490	—	13,751
Net change in short-term borrowings and other advances—intercompany	(22,152)	(8,615)	30,767	—	—
Capital contributions from parent	—	(748)	748	—	—
Other financing activities	(405)	—	—	—	(405)
Net cash provided by (used in) financing activities of continuing operations	$(34,302)	$1,475	$99,681	$—	$66,854
Effect of exchange rate changes on cash and due from banks	$—	$—	$693	$—	$693
Change in cash and due from banks and deposits with banks	$(9,799)	$(12,424)	$42,245	$—	$20,022
Cash and due from banks and deposits with banks at beginning of period	20,812	25,119	114,563	—	160,494
Cash and due from banks and deposits with banks at end of period	$11,013	$12,695	$156,808	$—	$180,516
Cash and due from banks	$13	$4,128	$19,634	$—	$23,775
Deposits with banks	11,000	8,567	137,174	—	156,741

Cash and due from banks and deposits with banks at end of period	$11,013	$12,695	$156,808	$ —	$180,516
Supplemental disclosure of cash flow information for continuing operations					
Cash paid during the year for income taxes	$(3,730)	$678	$5,135	$ —	$2,083
Cash paid during the year for interest	4,151	4,513	7,011	—	15,675
Non-cash investing activities					
Transfers to loans HFS from loans	$—	$—	$5,900	$ —	$5,900
Transfers to OREO and other repossessed assets	—	—	113	—	113

Condensed Consolidating Statements of Cash Flows

	Year ended December 31, 2016				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by operating activities of continuing operations	$11,605	$20,610	$21,518	$—	$53,733
Cash flows from investing activities of continuing operations					
Purchases of investments	$—	$(14)	$(211,388)	$—	$(211,402)
Proceeds from sales of investments	3,024	—	129,159	—	132,183
Proceeds from maturities of investments	234	—	65,291	—	65,525
Change in loans	—	—	(39,761)	—	(39,761)
Proceeds from sales and securitizations of loans	—	—	18,140	—	18,140
Change in federal funds sold and resales	—	(15,294)	(1,844)	—	(17,138)
Proceeds from significant disposals	—	—	265	—	265
Payments due to transfers of net liabilities associated with significant disposals	—	—	—	—	—
Changes in investments and advances—intercompany	(18,083)	(5,574)	23,657	—	—
Other investing activities	—	57	(2,004)	—	(1,947)
Net cash used in investing activities of continuing operations	$(14,825)	$(20,825)	$(18,485)	$—	$(54,135)
Cash flows from financing activities of continuing operations					
Dividends paid	$(2,287)	$—	$—	$—	$(2,287)
Issuance of preferred stock	2,498	—	—	—	2,498
Treasury stock acquired	(9,290)	—	—	—	(9,290)
Proceeds (repayments) from issuance of long-term debt, net	7,005	5,916	(4,575)	—	8,346
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	(9,453)	9,453	—	—
Change in deposits	—	—	24,394	—	24,394
Change in federal funds purchased and repos	—	3,236	(7,911)	—	(4,675)
Change in short-term borrowings	(164)	1,168	8,618	—	9,622
Net change in short-term borrowings and other advances—intercompany	4,620	680	(5,300)	—	—
Other financing activities	(316)	—	—	—	(316)
Net cash provided by financing activities of continuing operations	$2,066	$6,557	$19,669	$—	$28,292
Effect of exchange rate changes on cash and due from banks	$—	$—	$(493)	$—	$(493)
Change in cash and due from banks and deposits with banks	$(1,154)	$6,342	$22,209	$—	$27,397
Cash and due from banks and deposits with banks at beginning of period	21,966	18,777	92,354	—	133,097
Cash and due from banks and deposits with banks at end of period	$20,812	$25,119	$114,563	$—	$160,494
Cash and due from banks	$142	$4,690	$18,211	$—	$23,043

Deposits with banks	20,670	20,429	96,352	—	137,451
Cash and due from banks and deposits with banks at end of period	$20,812	$25,119	$114,563	$ —	$160,494
Supplemental disclosure of cash flow information for continuing operations					
Cash paid during the year for income taxes	$351	$92	$3,916	$ —	$4,359
Cash paid during the year for interest	4,397	3,115	4,555	—	12,067
Non-cash investing activities					
Transfers to loans held-for-sale from loans	$—	$—	$13,900	$ —	$13,900
Transfers to OREO and other repossessed assets	—	—	165	—	165

29. SELECTED QUARTERLY FINANCIAL DATA (UNAUDITED)

	2018				2017			
In millions of dollars, except per share amounts	Fourth	Third	Second	First	Fourth[1]	Third	Second	First
Revenues, net of interest expense	$17,124	$18,389	$18,469	$18,872	$17,504	$18,419	$18,155	$18,366
Operating expenses	9,893	10,311	10,712	10,925	10,332	10,417	10,760	10,723
Provisions for credit losses and for benefits and claims	1,925	1,974	1,812	1,857	2,073	1,999	1,717	1,662
Income from continuing operations before income taxes	$5,306	$6,104	$5,945	$6,090	$5,099	$6,003	$5,678	$5,981
Income taxes	1,001	1,471	1,444	1,441	23,864	1,866	1,795	1,863
Income (loss) from continuing operations	$4,305	$4,633	$4,501	$4,649	$(18,765)	$4,137	$3,883	$4,118
Income (loss) from discontinued operations, net of taxes	(8)	(8)	15	(7)	(109)	(5)	21	(18)
Net income before attribution of noncontrolling interests	$4,297	$4,625	$4,516	$4,642	$(18,874)	$4,132	$3,904	$4,100
Noncontrolling interests	(16)	3	26	22	19	(1)	32	10
Citigroup’s net income (loss)	$4,313	$4,622	$4,490	$4,620	$(18,893)	$4,133	$3,872	$4,090
Earnings per share[2]								
Basic								
Income (loss) from continuing operations	$1.65	$1.74	$1.62	$1.68	$(7.33)	$1.42	$1.27	$1.36
Net income (loss)	1.65	1.73	1.63	1.68	(7.38)	1.42	1.28	1.35
Diluted								
Income (loss) from continuing operations	1.65	1.74	1.62	1.68	(7.33)	1.42	1.27	1.36
Net income (loss)	1.64	1.73	1.63	1.68	(7.38)	1.42	1.28	1.35

This Note to the Consolidated Financial Statements is unaudited due to the Company’s individual quarterly results not being subject to an audit.

(1) The fourth quarter of 2017 includes the one-time impact of Tax Reform. See Notes 1 and 9 to the Consolidated Financial Statements.

(2) Due to averaging of shares, quarterly earnings per share may not sum to the totals reported for the full year.

[End of Consolidated Financial Statements and Notes to Consolidated Financial Statements]

FINANCIAL DATA SUPPLEMENT

RATIOS

	2018	2017	2016
Citigroup's net income to average assets[1]	0.94%	0.84%	0.82%
Return on average common stockholders' equity[1][2]	9.4	7.0	6.6
Return on average total stockholders' equity[1][3]	9.1	7.0	6.5
Total average equity to average assets[4]	10.3	12.1	12.6
Dividend payout ratio[1][5]	23.1	18.0	8.9

(1) 2017 excludes the one-time impact of Tax Reform. See "Significant Accounting Policies and Estimates—Income Taxes" above.

(2) Based on Citigroup's net income less preferred stock dividends as a percentage of average common stockholders' equity.

(3) Based on Citigroup's net income as a percentage of average total Citigroup stockholders' equity.

(4) Based on average Citigroup stockholders' equity as a percentage of average assets.

(5) Dividends declared per common share as a percentage of net income per diluted share.

AVERAGE DEPOSIT LIABILITIES IN OFFICES OUTSIDE THE U.S.[1]

	2018		2017		2016	
In millions of dollars at year end, except ratios	Average interest rate	Average balance	Average interest rate	Average balance	Average interest rate	Average balance
Banks	1.35%	$44,426	0.49%	$36,063	0.34%	$36,983
Other demand deposits	0.61	287,665	0.52	293,389	0.49	278,745
Other time and savings deposits[2]	1.31	209,410	1.23	191,363	1.16	189,049
Total	0.94%	$541,501	0.78%	$520,815	0.73%	$504,777

(1) Interest rates and amounts include the effects of risk management activities and also reflect the impact of the local interest rates prevailing in certain countries.

(2) Primarily consists of certificates of deposit and other time deposits in denominations of $100,000 or more.

MATURITY PROFILE OF TIME DEPOSITS IN U.S. OFFICES

In millions of dollars at December 31, 2018	Under 3 months	Over 3 to 6 months	Over 6 to 12 months	Over 12 months
Over $100,000				
Certificates of deposit	$18,858	$6,952	$4,761	$2,755
Other time deposits	6,007	—	—	717
Over $250,000				
Certificates of deposit	$18,368	$5,455	$2,458	$1,613
Other time deposits	6,022	—	—	60

SUPERVISION, REGULATION AND OTHER

SUPERVISION AND REGULATION

Citi is subject to regulation under U.S. federal and state laws, as well as applicable laws in the other jurisdictions in which it does business.

General

Citigroup is a registered bank holding company and financial holding company and is regulated and supervised by the Federal Reserve Board. Citigroup's nationally chartered subsidiary banks, including Citibank, are regulated and supervised by the Office of the Comptroller of the Currency (OCC). The Federal Deposit Insurance Corporation (FDIC) also has examination authority for banking subsidiaries whose deposits it insures. Overseas branches of Citibank are regulated and supervised by the Federal Reserve Board and OCC and overseas subsidiary banks by the Federal Reserve Board. These overseas branches and subsidiary banks are also regulated and supervised by regulatory authorities in the host countries. In addition, the Consumer Financial Protection Bureau (CFPB) regulates consumer financial products and services. Citi is also subject to laws and regulations concerning the collection, use, sharing and disposition of certain customer, employee and other personal and confidential information, including those imposed by the Gramm-Leach-Bliley Act, the Fair Credit Reporting Act and the EU General Data Protection Regulation. For more information on U.S. and foreign regulation affecting or potentially affecting Citi, see "Risk Factors" above.

Other Bank and Bank Holding Company Regulation

Citi, including its banking subsidiaries, is subject to regulatory limitations, including requirements for banks to maintain reserves against deposits, requirements as to liquidity, risk-based capital and leverage (see "Capital Resources" above and Note 18 to the Consolidated Financial Statements), restrictions on the types and amounts of loans that may be made and the interest that may be charged and limitations on investments that can be made and services that can be offered. The Federal Reserve Board may also expect Citi to commit resources to its subsidiary banks in certain circumstances. Citi is also subject to anti-money laundering and financial transparency laws, including standards for verifying client identification at account opening and obligations to monitor client transactions and report suspicious activities.

Securities and Commodities Regulation

Citi conducts securities underwriting, brokerage and dealing activities in the U.S. through Citigroup Global Markets Inc. (CGMI), its primary broker-dealer, and other broker-dealer subsidiaries, which are subject to regulations of the U.S. Securities and Exchange Commission (SEC), the Financial Industry Regulatory Authority and certain exchanges. Citi conducts similar securities activities outside the U.S., subject to local requirements, through various subsidiaries and affiliates, principally Citigroup Global Markets Limited in London (CGML), which is regulated principally by the U.K. Financial Conduct Authority (FCA), and Citigroup Global

Markets Japan Inc. in Tokyo, which is regulated principally by the Financial Services Agency of Japan.

Citi also has subsidiaries that are members of futures exchanges. In the U.S., CGMI is a member of the principal U.S. futures exchanges, and Citi has subsidiaries that are registered as futures commission merchants and commodity pool operators with the Commodity Futures Trading Commission (CFTC). Citibank, CGMI, Citigroup Energy Inc. and CGML, also are registered as swap dealers with the CFTC. CGMI is also subject to SEC and CFTC rules that specify uniform minimum net capital requirements. Compliance with these rules could limit those operations of CGMI that require the intensive use of capital and also limits the ability of broker-dealers to transfer large amounts of capital to parent companies and other affiliates. See also "Capital Resources" and Note 18 to the Consolidated Financial Statements for a further discussion of capital considerations of Citi's non-banking subsidiaries.

Transactions with Affiliates

Transactions between Citi's U.S. subsidiary depository institutions and their non-bank affiliates are regulated by the Federal Reserve Board, and are generally required to be on arm's-length terms. See also "Managing Global

Risk—Liquidity Risk" above.

COMPETITION

The financial services industry is highly competitive. Citi's competitors include a variety of financial services and advisory companies. Citi competes for clients and capital (including deposits and funding in the short- and long-term debt markets) with some of these competitors globally and with others on a regional or product basis. Citi's competitive position depends on many factors, including, among others, the value of Citi's brand name, reputation, the types of clients and geographies served; the quality, range, performance, innovation and pricing of products and services; the effectiveness of and access to distribution channels, technology advances, customer service and convenience; the effectiveness of transaction execution, interest rates and lending limits; and regulatory constraints. Citi's ability to compete effectively also depends upon its ability to attract new employees and retain and motivate existing employees, while managing compensation and other costs. For additional information on competitive factors and uncertainties impacting Citi's businesses, see "Risk Factors—Operational Risks" above.

PROPERTIES

Citi's principal executive offices are currently in New York City at 388 Greenwich Street and are owned and fully occupied by Citi.

Citigroup Global Markets Holdings Inc.'s principal executive offices are in New York City at 388 Greenwich Street and are owned and fully occupied by Citi.

Citigroup's principal executive offices in EMEA are at 25 and 33 Canada Square in London's Canary Wharf, with both buildings subject to long-term leases.

In Asia, Citi's principal executive offices are in leased premises at Champion Tower in Hong Kong. Citi has other significant leased premises, including in Singapore, Manila and Japan. Citi has major or full ownership interests in country headquarter locations in Shanghai, Seoul, Kuala Lumpur and Mumbai.

Citi's principal executive offices in Mexico, which also serve as the headquarters of Citibanamex, are owned and located in Mexico City. Citi's principal executive offices for Latin America (other than Mexico) are in leased premises in Miami.

Citi also owns or leases over 52 million square feet of real estate in 95 countries, consisting of over 7,500 properties. Citi continues to evaluate its global real estate footprint and space requirements and may determine from time to time that certain of its premises are no longer necessary. There is no assurance that Citi will be able to dispose of any excess premises or that it will not incur charges in connection with such dispositions, which could be material to Citi's operating results in a given period.

Citi has developed programs for its properties to achieve long-term energy efficiency objectives and reduce its greenhouse gas emissions to lessen its impact on climate change. These activities could help to mitigate, but will not eliminate, Citi's potential risk from future climate change regulatory requirements.

For further information concerning leases, see Note 26 to the Consolidated Financial Statements.

DISCLOSURE PURSUANT TO SECTION 219 OF THE IRAN THREAT REDUCTION AND SYRIA HUMAN RIGHTS ACT

Pursuant to Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012 (Section 219), which added Section 13(r) to the Securities Exchange Act of 1934, as amended, Citi is required to disclose in its annual or quarterly reports, as applicable, whether it or any of its affiliates knowingly engaged in certain activities, transactions or dealings relating to Iran or with individuals or entities that are subject to sanctions under U.S. law. Disclosure is generally required even where the activities, transactions or dealings were conducted in compliance with applicable law. Citi, in its related quarterly report on Form 10-Q, previously disclosed reportable activities pursuant to Section 219 for the second and third quarters of 2018.

During the fourth quarter of 2018, Citibank Europe plc, a subsidiary of Citibank, acting as an intermediary bank processed a transaction between two Irish banks involving the Iranian Embassy in Ireland. The total value of the payment was EUR 90.00 (USD 104.24). This transaction was for visa-related fees and is exempt pursuant to the travel exemption of the Iranian Transactions and Sanctions Regulations. Citibank Europe plc realized nominal fees for the processing of this payment.

UNREGISTERED SALES OF EQUITY, PURCHASES OF EQUITY SECURITIES, DIVIDENDS

Unregistered Sales of Equity Securities
None.

Equity Security Repurchases
The following table summarizes Citi's common stock repurchases during the three months ended December 31, 2018:

In millions, except per share amounts	Total shares purchased	Average price paid per share	Approximate dollar value of shares that may yet be purchased under the plan or programs
October 2018			
Open market repurchases[1]	32.0	$ 68.78	$ 10,127
Employee transactions[2]	—	—	N/A
November 2018			
Open market repurchases[1]	20.7	64.81	8,784
Employee transactions[2]	—	—	N/A
December 2018			
Open market repurchases[1]	21.1	54.87	7,630
Employee transactions[2]	—	—	N/A
Total for 4Q18 and remaining program balance as of December 31, 2018	73.8	$ 63.70	$ 7,630

(1) Represents repurchases under the $17.6 billion 2018 common stock repurchase program (2018 Repurchase Program) that was approved by Citigroup's Board of Directors and announced on June 28, 2018. The 2018 Repurchase Program was part of the planned capital actions included by Citi in its 2018 Comprehensive Capital Analysis and Review (CCAR). The 2018 Repurchase Program expires on June 30, 2019. Shares repurchased under the 2018 Repurchase Program were added to treasury stock.

(2) Consisted of shares added to treasury stock related to (i) certain activity on employee stock option program exercises where the employee delivers existing shares to cover the option exercise, or (ii) under Citi's employee restricted or deferred stock programs where shares are withheld to satisfy tax requirements.

N/A Not applicable

Dividends
In addition to Board of Directors' approval, Citi's ability to pay common stock dividends substantially depends on regulatory approval, including an annual regulatory review of the results of the CCAR process required by the Federal Reserve Board and the supervisory stress tests required under the Dodd-Frank Act. For additional information regarding Citi's capital planning and stress testing, see "Capital Resources—Current Regulatory Capital Standards—Stress Testing Component of Capital Planning" and "Risk Factors—Strategic Risks" above. Any dividend on Citi's outstanding common stock would also need to be made in compliance with Citi's obligations to its outstanding preferred stock.
For information on the ability of Citigroup's subsidiary depository institutions to pay dividends, see Note 18 to the Consolidated Financial Statements.

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PERFORMANCE GRAPH

Comparison of Five-Year Cumulative Total Return
The following graph and table compare the cumulative total return on Citi's common stock with the cumulative total return of the S&P 500 Index and the S&P Financial Index over the five-year period through December 31, 2018. The graph and table assume that $100 was invested on December 31, 2013 in Citi's common stock, the S&P 500 Index and the S&P Financial Index, and that all dividends were reinvested.

Comparison of Five-Year Cumulative Total Return
For the years ended

DATE	CITI	S&P 500	S&P FINANCIALS
31-Dec-2013	100.0	100.0	100.0
31-Dec-2014	103.9	113.7	115.2
31-Dec-2015	99.7	115.3	113.4
31-Dec-2016	115.5	129.0	139.3
31-Dec-2017	146.8	157.2	170.2
31-Dec-2018	105.0	150.3	148.0

Note: Citi's common stock is listed on the NYSE under the ticker symbol "C" and held by 70,194 common stockholders of record as of January 31, 2019.

CORPORATE INFORMATION

CITIGROUP EXECUTIVE OFFICERS

Citigroup’s executive officers as of February 22, 2019 are:

Name	Age	Position and office held
Raja J. Akram	46	Controller and Chief Accounting Officer
Francisco Aristeguieta	53	CEO, Asia Pacific
Stephen Bird	52	CEO, Global Consumer Banking
Michael L. Corbat	58	Chief Executive Officer
James C. Cowles	63	CEO, Europe, Middle East and Africa
Barbara Desoer	66	CEO, Citibank, N.A.
James A. Forese	55	President; CEO, Institutional Clients Group
Jane Fraser	51	CEO, Latin America
John C. Gerspach	65	Chief Financial Officer
Bradford Hu	55	Chief Risk Officer
Sara Wechter	38	Head of Human Resources
Rohan Weerasinghe	68	General Counsel and Corporate Secretary
Mike Whitaker	55	Head of Operations and Technology

Each executive officer has held executive or management positions with Citigroup for at least five years, except that:

- Ms. Wechter joined Citi in 2004 and assumed her current position in July 2018. Previously, she had served as Citi's Head of Talent and Diversity as well as Chief of Staff to Citi CEO Michael Corbat. She served as Chief of Staff to both Michael O'Neill and Richard Parsons during their terms as Chairman of Citi's Board of Directors. In addition, she held roles in Citi's Institutional Clients Group, including Corporate M&A and Strategy and Investment Banking,
- Mr. Akram joined Citi in 2006 and assumed his current position in November 2017. Previously, he had served as Deputy Controller since April 2017. He held a number of other roles in Citi Finance, including Lead Finance Officer for Treasury and Trade Solutions, Brazil Country Controller, Brazil Country Finance Officer and head of the Corporate Accounting Policy team supporting M&A activities.

Code of Conduct, Code of Ethics

Citi has a Code of Conduct that maintains its commitment to the highest standards of conduct. The Code of Conduct is supplemented by a Code of Ethics for Financial Professionals (including accounting, controllers, financial reporting operations, financial planning and analysis, treasury, tax, strategy and M&A, investor relations and regional/product finance professionals and administrative staff) that applies worldwide. The Code of Ethics for Financial Professionals applies to Citi’s principal executive officer, principal financial officer and principal accounting officer. Amendments and waivers, if any, to the Code of Ethics for Financial Professionals will be disclosed on Citi’s website, www.citigroup.com.

Both the Code of Conduct and the Code of Ethics for Financial Professionals can be found on the Citi website by clicking on “About Us,” and then “Corporate Governance.” Citi’s Corporate Governance Guidelines can also be found there, as well as the charters for the Audit Committee, the Ethics and Culture Committee, the Nomination, Governance and Public Affairs Committee, the Operations and Technology Committee, the Personnel and Compensation Committee and the Risk Management Committee of the Board. These materials are also available by writing to Citigroup Inc., Corporate Governance, 388 Greenwich Street, 17th Floor, New York, New York 10013.

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CITIGROUP BOARD OF DIRECTORS

Michael L. Corbat
Chief Executive Officer
Citigroup Inc.

Ellen M. Costello
Former President and CEO
BMO Financial Corporation and Former U.S. Country Head
BMO Financial Group

John C. Dugan
Chair
Citigroup Inc.

Duncan P. Hennes
Co-Founder and Partner
Atrevida Partners, LLC

Peter Blair Henry
Dean Emeritus and W. R. Berkley Professor of Economics and Finance
New York University Stern School of Business

Franz B. Humer
Former Chairman
Roche Holding Ltd.

S. Leslie Ireland
Former Assistant Secretary for Intelligence and Analysis
U.S. Department of the Treasury

Lew W. (Jay) Jacobs, IV
Former President and Managing Director
Pacific Investment Management Company LLC (PIMCO)

Renée J. James
Chairman and CEO
Ampere Computing and Operating Executive
The Carlyle Group

Eugene M. McQuade
Former Chief Executive Officer Citibank, N.A. and
Former Vice Chairman
Citigroup Inc.

Gary M. Reiner
Operating Partner
General Atlantic LLC

Anthony M. Santomero
Former President
Federal Reserve Bank of Philadelphia

Diana L. Taylor
Former Superintendent of Banks
State of New York

James S. Turley
Former Chairman and CEO
Ernst & Young

Deborah C. Wright
Managing Director of U.S. Jobs and Economic Opportunity Rockefeller Foundation

Ernesto Zedillo Ponce de Leon
Director, Center for the Study of Globalization and Professor in the Field of International Economics and Politics
Yale University

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on the 22nd day of February, 2019.

Citigroup Inc.
(Registrant)

/s/ John C. Gerspach

John C. Gerspach
Chief Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated on the 22nd day of February, 2019.

Citigroup's Principal Executive Officer and a Director:

/s/ Michael L. Corbat

Michael L. Corbat

Citigroup's Principal Financial Officer:

/s/ John C. Gerspach

John C. Gerspach

Citigroup's Principal Accounting Officer:

/s/ Raja J. Akram

Raja J. Akram

The Directors of Citigroup listed below executed a power of attorney appointing John C. Gerspach their attorney-in-fact, empowering him to sign this report on their behalf.

Ellen M. Costello	Eugene M. McQuade
John C. Dugan	Gary M. Reiner
Duncan P. Hennes	Anthony M. Santomero
Peter Blair Henry	Diana L. Taylor
Franz B. Humer	James S. Turley
S. Leslie Ireland	Deborah C. Wright
Lew W. (Jay) Jacobs, IV	Ernesto Zedillo Ponce de Leon
Renée J. James	

/s/ John C. Gerspach

John C. Gerspach

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
3.01+	Restated Certificate of Incorporation of Citigroup Inc., as amended, as in effect on the date hereof.
3.02	By-Laws of the Company, as amended, as in effect on the date hereof, incorporated by reference to the Company's Current Report on Form 8-K filed January 18, 2019 (File No. 001-09924).
4.01	Form of Senior Indenture between the Company and The Bank of New York Mellon, as trustee, incorporated by reference to Exhibit 4.8 to the Company's Registration Statement on Form S-3 filed November 13, 2013 (File No. 333-192302).
4.02	First Supplemental Indenture, dated as of February 1, 2016, between Citigroup and The Bank of New York Mellon, as trustee, incorporated by reference to Exhibit 4.01 to the Company's Current Report on Form 8-K filed on February 1, 2016 (File No. 001-9924).
4.03	Second Supplemental Indenture, dated as of December 29, 2016, between Citigroup and The Bank of New York Mellon, as trustee, incorporated by reference to Exhibit 4.01 to the Company's Current Report on Form 8-K filed on December 29, 2016 (File No. 001-9924).
4.04	Third Supplemental Indenture dated as of June 26, 2017 among Citigroup Global Markets Holdings Inc., the Company and The Bank of New York Mellon, as trustee, to Indenture dated as of November 13, 2013, incorporated by reference to Exhibit 4.01 to the Company's Quarterly Report on Form 10-Q filed August 1, 2017 (File No. 001-09924).
4.05	Subordinated Debt Indenture, dated as of April 12, 2001, between the Company and The Bank of New York Mellon, as successor to JP Morgan Chase Bank (formerly Bank One Trust Company, N.A.), as trustee, incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-3 filed February 4, 2013 (No. 333-186425).
4.06	First Supplemental Indenture, dated as of August 2, 2004, between the Company and J.P. Morgan Trust Company, N.A. (formerly Bank One Trust Company, N.A.), as trustee, incorporated by reference to Exhibit 4.13 to the Company's Registration Statement on Form S-3/A filed August 31, 2004 (No. 333-117615).
4.07	Second Supplemental Indenture, dated as of May 18, 2016, between Citigroup and The Bank of New York Mellon, as successor to J.P. Morgan Trust Company, N.A. (formerly Bank One Trust Company, N.A.), as trustee, incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed on May 20, 2016 (No. 001-9924).
4.08	Third Supplemental Indenture, dated as of March 1, 2017, between Citigroup and The Bank of New York Mellon, as successor to J.P. Morgan Trust Company, N.A. (formerly Bank One Trust Company, N.A.), as trustee, incorporated by reference to Exhibit 4.11 to the Company's Registration Statement on Form S-3 filed March 1, 2017 (No. 333-216372).
4.09	Indenture, dated as of March 15, 1987, between Primerica Corporation, a New Jersey corporation, and The Bank of New York, as trustee, incorporated by reference to Exhibit 4.01 to the Company's Registration Statement on Form S-3 filed December 8, 1992 (No. 03355542).
4.10	

First Supplemental Indenture, dated as of December 15, 1988, among Primerica Corporation, Primerica Holdings, Inc. and The Bank of New York, as trustee, incorporated by reference to Exhibit 4.02 to the Company's Registration Statement on Form S-3 filed December 8, 1992 (No. 03355542).

4.11	Second Supplemental Indenture, dated as of January 31, 1991, between Primerica Holdings, Inc. and The Bank of New York, as trustee, incorporated by reference to Exhibit 4.03 to the Company's Registration Statement on Form S-3 filed December 8, 1992 (No. 03355542).
4.12	Third Supplemental Indenture, dated as of December 9, 1992, among Primerica Holdings, Inc., Primerica Corporation and The Bank of New York, as trustee, incorporated by reference to Exhibit 5 to the Company's Form 8-A dated December 21, 1992, with respect to its 7 3/4% Notes Due June 15, 1999 (No. 001-09924).
4.13	Fourth Supplemental Indenture, dated as of November 2, 1998, between the Company and The Bank of New York, as trustee, incorporated by reference to Exhibit 4.01 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 1998 (No. 001-09924).
4.14	Fifth Supplemental Indenture, dated as of December 9, 2008, between the Company and The Bank of New York Mellon, as trustee, incorporated by reference to Exhibit 4.04 to the Company's Current Report on Form 8-K filed December 11, 2008 (No. 001-09924).
4.15	Sixth Supplemental Indenture, dated as of December 20, 2012, between the Company and The Bank of New York Mellon, as trustee, providing for the issuance of debt securities, incorporated by reference to Exhibit 4.5 to the Company's Current Report on Form 8-K filed December 21, 2012 (No. 001-09924).
4.16	Seventh Supplemental Indenture, dated as of May 18, 2016, between Citigroup Inc. and The Bank of New York Mellon, as trustee, incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on May 20, 2016 (No. 001-9924).
4.17	Senior Debt Indenture, dated as of June 1, 2005, among Citigroup Funding Inc., the Company and The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank, N.A., incorporated by reference to Exhibit 4(b) to the Company's Registration Statement on Form S-3 filed March 13, 2006 (No. 333-132370-01).
4.18	Second Supplemental Indenture, dated as of December 20, 2012, among Citigroup Funding Inc., the Company and The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank, N.A., incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed December 21, 2012 (No. 001-09924).
4.19	Indenture, dated as of July 23, 2004, between the Company and JPMorgan Chase Bank, as trustee, incorporated by reference to Exhibit 4.28 to the Company's Registration Statement on Form S-3 filed July 23, 2004 (No. 333-117615).
4.20	Warrant Agreement (relating to Warrants (expiring January 4, 2019)), dated as of January 25, 2011, between the Company and Computershare Inc. and Computershare Trust Company, N.A., as Warrant Agent, incorporated by reference to Exhibit 4.1 to the Company's Form 8-A filed January 26, 2011 (File No. 001-09924).
4.21	Specimen Warrant for 255,033,142 Warrants, incorporated by reference to Exhibit 4.2 to the Company's Form 8-A filed January 26, 2011 (File No. 001-09924).
4.22	Warrant Agreement (relating to Warrants (expiring October 28, 2018)), dated as of January 25, 2011, between the Company and Computershare Inc. and Computershare Trust Company, N.A., as Warrant Agent, incorporated by reference to Exhibit 4.1 to the Company's Form 8-A filed January 26, 2011 (File No. 001-09924).
4.23	Specimen Warrant for 210,084,034 Warrants, incorporated by reference to Exhibit 4.2 to the Company's Form 8-A filed January 26, 2011 (File No. 001-09924).

4.24	Form of Capital Securities Guarantee Agreement between the Company, as Guarantor, and The Bank of New York Mellon, as Guarantee Trustee, incorporated by reference to Exhibit 4.32 to the Company's Registration Statement on Form S-3 filed July 2, 2004 (File No. 333-117615).

4.25	Specimen Physical Common Stock Certificate of the Company, incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed May 9, 2011 (File No. 001-09924).
10.01*	Citi Discretionary Incentive and Retention Award Plan (as Amended and Restated Effective as of January 1, 2015), incorporated by reference to Exhibit 10.01 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014 (File No. 001-09924) (the "Company's 2014 10-K").
10.02.1*	Citigroup 1999 Stock Incentive Plan (as amended and restated effective January 1, 2009), incorporated by reference to Exhibit 10.15 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2008 (File No. 001-09924) (the "Company's 2008 10-K").
10.02.2*	Citigroup 2009 Stock Incentive Plan (as amended and restated effective April 24, 2013), incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed April 26, 2013 (File No. 001-09924).
10.02.3*	Citigroup 2014 Stock Incentive Plan (as amended and restated effective April 24, 2018), incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 30, 2018 (File No. 001-09924).
10.03*	Citigroup Inc. Deferred Cash Award Plan (as Amended and Restated Effective as of January 1, 2015), incorporated by reference to Exhibit 10.03 to the Company's 2014 10-K.
10.04*	Form of Citigroup Inc. CAP/DCAP Agreement, incorporated by reference to Exhibit 10.01 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2015 (File No. 001-09924).
10.06*	The Amended and Restated 2011 Citigroup Executive Performance Plan (as amended and restated January 1, 2016, and as further amended on February 16, 2017), incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 10-Q filed for the quarterly period ended March 31, 2017 (File No. 001-09924).
10.06.1*	Form of Citigroup Inc. Performance Share Unit Award Agreement (awards dated February 16, 2016 and in future years), incorporated by reference to Exhibit 10.02 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2016 (File No. 001-09924).
10.06.2*	Form of Citigroup Inc. Performance Share Unit Award Agreement (awards dated February 16, 2017 and in future years), incorporated by reference to Exhibit 10.01 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2017 (File No. 001-09924).
10.07*	Citigroup Management Committee Termination Notice and Non-Solicitation Policy, effective October 2, 2006, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed October 6, 2006 (File No. 001-09924).
10.08.1*	Citicorp Deferred Compensation Plan, effective October 1995, incorporated by reference to Exhibit 10 to Citicorp's Registration Statement on Form S-8 filed February 15, 1996 (File No. 333-00983).
10.08.2*	Amendment to the Citicorp Deferred Compensation Plan, incorporated by reference to Exhibit 10.18.2 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 1999 (File No. 001-09924) (the "Company's 1999 10-K").
10.08.3*	

	Amendment to the Citicorp Deferred Compensation Plan, effective as of September 28, 2001, incorporated by reference to Exhibit 10.17.3 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2001 (File No. 001-09924).
10.08.4*	Amendment to the Citicorp Deferred Compensation Plan, adopted November 22, 2009, incorporated by reference to Exhibit 10.01.5 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2009 (File No. 001-09924) (the "Company's 2009 10-K").

10.09.1*	Supplemental ERISA Compensation Plan of Citibank, N.A. and Affiliates, as amended and restated (the "Citibank Supplemental ERISA Plan"), incorporated by reference to Exhibit 10.(G) to Citicorp's Annual Report on Form 10-K for the fiscal year ended December 31, 1997 (File No. 001-05378).
10.09.2*	Amendment to the Citibank Supplemental ERISA Plan, effective January 1, 2000, incorporated by reference to Exhibit 10.21.2 to the Company's 1999 10-K.
10.09.3*	Resolution Amending the Citibank Supplemental ERISA Plan, incorporated by reference to Exhibit 10.04.1 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2005 (File No. 001-09924).
10.09.4*	Amendment to the Citibank Supplemental ERISA Plan, effective January 1, 2009, incorporated by reference to Exhibit 10.01.4 to the Company's 2009 10-K.
10.09.5*	Amendment to the Citibank Supplemental ERISA Plan, effective November 22, 2009, incorporated by reference to Exhibit 10.01.5 to the Company's 2009 10-K.
10.09.6*	Amendment to the Citibank Supplemental ERISA Plan, effective December 31, 2012, incorporated by reference to Exhibit 10.01.6 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2012 (File No. 001-09924).
10.09.7+	Amendment to the Citibank Supplemental ERISA Plan, effective December 31, 2018.
10.10*	Citigroup Inc. Omnibus Non-Qualified Plan Amendment, effective as of June 2, 2014, incorporated by reference to Exhibit 10.01 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2014 (File No. 001-09924).
10.11*	Letter Agreement, dated December 21, 2011, between Citigroup Inc. and Michael Corbat, incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed December 22, 2011 (File No. 001-09924).
10.12*	Citigroup Inc. Non-Employee Directors Compensation Plan (effective as of January 1, 2008), incorporated by reference to Exhibit 10.01 to the Company's Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2007 (File No. 001-09924).
21.01+	Subsidiaries of the Company.
23.01+	Consent of KPMG LLP, Independent Registered Public Accounting Firm.
24.01+	Powers of Attorney.
31.01+	Certification of principal executive officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.02+	Certification of principal financial officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.01+	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
99.01+	List of Securities Registered Pursuant to Section 12(b) of the Securities Exchange Act of 1934.

101.01+	Financial statements from the Annual Report on Form 10-K of the Company for the fiscal year ended December 31, 2018, filed February 22, 2019, formatted in XBRL: (i) the Consolidated Statement of Income, (ii) the Consolidated Balance Sheet, (iii) the Consolidated Statement of Changes in Equity, (iv) the Consolidated Statement of Cash Flows and (v) the Notes to Consolidated Financial Statements.

The total amount of securities authorized pursuant to any instrument defining rights of holders of long-term debt of the Company does not exceed 10% of the total assets of the Company and its consolidated subsidiaries. The Company will furnish copies of any such instrument to the SEC upon request.

Copies of any of the exhibits referred to above will be furnished at a cost of $0.25 per page (although no charge will be made for the 2018 Annual Report on Form 10-K) to security holders who make written request to Citigroup Inc., Corporate Governance, 388 Greenwich Street, New York, NY 10013.

* Denotes a management contract or compensatory plan or arrangement.
+ Filed herewith.