

Financial Section

Exhibit 13.1

THE BANK OF NEW YORK MELLON CORPORATION
2017 Annual Report
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The Bank of New York Mellon Corporation (and its subsidiaries)

Financial Summary

<i>(dollar amounts in millions, except per common share amounts and unless otherwise noted)</i>	2017	2016	2015	2014	2013
Year ended Dec. 31,					
Fee and other revenue	\$ 12,165	\$ 12,073	\$ 12,082	\$ 12,649	\$ 11,856
Income from consolidated investment management funds	70	26	86	163	183
Net interest revenue	3,308	3,138	3,026	2,880	3,009
Total revenue	15,543	15,237	15,194	15,692	15,048
Provision for credit losses	(24)	(11)	160	(48)	(35)
Noninterest expense	10,957	10,523	10,799	12,177	11,306
Income before income taxes	4,610	4,725	4,235	3,563	3,777
Provision for income taxes	496	1,177	1,013	912	1,592
Net income	4,114	3,548	3,222	2,651	2,185
Net (income) attributable to noncontrolling interests (a)	(24)	(1)	(64)	(84)	(81)
Net income applicable to shareholders of The Bank of New York Mellon Corporation	4,090	3,547	3,158	2,567	2,104
Preferred stock dividends	(175)	(122)	(105)	(73)	(64)
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	\$ 3,915	\$ 3,425	\$ 3,053	\$ 2,494	\$ 2,040
Earnings per share applicable to common shareholders of The Bank of New York Mellon Corporation:					
Basic	\$ 3.74	\$ 3.16	\$ 2.73	\$ 2.17	\$ 1.74
Diluted	\$ 3.72	\$ 3.15	\$ 2.71	\$ 2.15	\$ 1.73
Average common shares and equivalents outstanding of The Bank of New York Mellon Corporation (in thousands):					
Basic	1,034,281	1,066,286	1,104,719	1,129,897	1,150,689
Diluted	1,040,290	1,072,013	1,112,511	1,137,480	1,154,441
At Dec. 31					
Interest-earning assets	\$ 316,261	\$ 280,332	\$ 338,955	\$ 317,646	\$ 305,169
Assets of operations	371,027	332,238	392,379	376,021	363,244
Total assets	371,758	333,469	393,780	385,303	374,516
Deposits	244,322	221,490	279,610	265,869	261,129
Long-term debt	27,979	24,463	21,547	20,264	19,864
Preferred stock	3,542	3,542	2,552	1,562	1,562
Total The Bank of New York Mellon Corporation common shareholders' equity	37,709	35,269	35,485	35,879	35,935
At Dec. 31					
Assets under management (in billions) (b)	\$ 1,893	\$ 1,648	\$ 1,625	\$ 1,686	\$ 1,557
Assets under custody and/or administration (in trillions) (c)	33.3	29.9	28.9	28.5	27.6
Market value of securities on loan (in billions) (d)	408	296	277	289	235
Return on common equity (e)	10.8%	9.6%	8.6%	6.8%	5.9%
Adjusted return on common equity – Non-GAAP (e)(f)	11.4	10.2	9.5	8.1	8.3
Return on tangible common equity – Non-GAAP (e)(f)(g)	23.9	21.2	19.7	16.0	15.3
Adjusted return on tangible common equity – Non-GAAP (e)(f)(g)	24.4	21.4	20.7	17.6	19.7
Return on average assets	1.14	0.96	0.82	0.67	0.60
Pre-tax operating margin (e)	30	31	28	23	25
Adjusted pre-tax operating margin – Non-GAAP (e)(f)	32	33	31	28	28
Fee revenue as a percentage of total revenue	78	79	79	80	78
Percentage of non-U.S. total revenue	36	34	36	38	37
Net interest margin	1.14	1.03	0.96	0.95	1.10

(a) Primarily attributable to noncontrolling interests related to consolidated investment management funds.

(b) Excludes securities lending cash management assets and assets managed in the Investment Services business.

(c) Includes the assets under custody and/or administration of CIBC Mellon Global Securities Services Company ("CIBC Mellon"), a joint venture with the Canadian Imperial Bank of Commerce, of \$1.3 trillion at Dec. 31, 2017, \$1.2 trillion at Dec. 31, 2016, \$1.0 trillion at Dec. 31, 2015, \$1.1 trillion at Dec. 31, 2014 and \$1.2 trillion at Dec. 31, 2013.

(d) Represents the total amount of securities on loan in our agency securities lending program managed by the Investment Services business. Excludes securities for which BNY Mellon acts as an agent on behalf of CIBC Mellon clients, which totaled \$71 billion at Dec. 31, 2017, \$63 billion at Dec. 31, 2016, \$55 billion at Dec. 31, 2015, \$65 billion at Dec. 31, 2014 and \$62 billion at Dec. 31, 2013.

(e) See "Supplemental information – Explanation of GAAP and Non-GAAP financial measures" beginning on page 118 for the reconciliation of Non-GAAP measures.

(f) Non-GAAP information for all periods presented excludes net income attributable to noncontrolling interests of consolidated investment management funds, amortization of intangible assets and merger and integration ("M&I"), litigation and restructuring charges. Non-GAAP information for 2016 and 2015 also excludes the (recovery) impairment charge related to the loan to Sentinel Management Group, Inc. ("Sentinel"). Non-GAAP information for 2014 also excludes the gains on the sales of our equity investment in Wing Hang Bank Limited ("Wing Hang") and our One Wall Street building, the charge related to investment management funds, net of incentives, and the benefit primarily related to a tax carryback claim. Non-GAAP information for 2013 also excludes the charge related to investment management funds, net of incentives and the net charge related to the disallowance of certain foreign tax credits.

(g) Tangible common equity – Non-GAAP for all periods presented excludes goodwill and intangible assets, net of deferred tax liabilities, which, at Dec. 31, 2017, have been remeasured at the lower statutory corporate tax rate.

The Bank of New York Mellon Corporation (and its subsidiaries)

Financial Summary (continued)

(dollar amounts in millions, except per common share amounts and unless otherwise noted)

	2017	2016	2015	2014	2013
Cash dividends per common share	\$ 0.86	\$ 0.72	\$ 0.68	\$ 0.66	\$ 0.58
Common dividend payout ratio	23%	23%	25%	31% (a)	34% (a)
Common dividend yield	1.6%	1.5%	1.6%	1.6%	1.7%
Closing stock price per common share	\$ 53.86	\$ 47.38	\$ 41.22	\$ 40.57	\$ 34.94
Market capitalization (in billions)	\$ 54.6	\$ 49.6	\$ 44.7	\$ 45.4	\$ 39.9
Book value per common share (b)	\$ 37.21	\$ 33.67	\$ 32.69	\$ 32.09	\$ 31.46
Tangible book value per common share – Non-GAAP (b)(c)	\$ 18.24	\$ 16.19	\$ 15.27	\$ 14.70	\$ 13.95
Full-time employees	52,500	52,000	51,200	50,300	51,100
Year-end common shares outstanding (in thousands)	1,013,442	1,047,488	1,085,343	1,118,228	1,142,250
Average total equity to average total assets	11.7%	10.7%	10.2%	10.2%	10.6%

Capital ratios at Dec. 31,

Consolidated regulatory capital ratios: (d)(e)

Standardized:

CET1 ratio	11.9%	12.3%	11.5%	15.0%	14.5%
Tier 1 capital ratio	14.2	14.5	13.1	16.3	16.2
Total (Tier 1 plus Tier 2) capital ratio	15.1	15.2	13.5	16.9	17.0

Advanced:

CET1 ratio	10.7	10.6	10.8	11.2	N/A
Tier 1 capital ratio	12.7	12.6	12.3	12.2	N/A
Total (Tier 1 plus Tier 2) capital ratio	13.4	13.0	12.5	12.5	N/A
Leverage capital ratio (e)	6.6	6.6	6.0	5.6	5.4
Supplementary leverage ratio (e)	6.1	6.0	5.4	N/A	N/A

BNY Mellon shareholders' equity to total assets ratio	11.1	11.6	9.7	9.7	10.0
BNY Mellon common shareholders' equity to total assets ratio	10.1	10.6	9.0	9.3	9.6

Selected regulatory capital ratios - fully phased-in – Non-GAAP (f):

Estimated CET1 ratio (d):

Standardized Approach	11.5	11.3	10.2	10.6	10.6
Advanced Approach	10.3	9.7	9.5	9.8	11.3

Estimated SLR	5.9	5.6	4.9	4.4	N/A
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- (a) The common dividend payout ratio was 25% for 2014 after adjusting for increased litigation expense, and 26% for 2013 after adjusting for the net impact of the U.S. Tax Court's decisions regarding certain foreign tax credits.
- (b) See "Supplemental information – Explanation of GAAP and Non-GAAP financial measures" beginning on page 118 for the reconciliation of Non-GAAP measures.
- (c) Tangible book value – Non-GAAP for all periods presented excludes goodwill and intangible assets, net of deferred tax liabilities, which, at Dec. 31, 2017, have been remeasured at the lower statutory corporate tax rate.
- (d) Risk-based capital ratios at Dec. 31, 2014 and Dec. 31, 2013 do not reflect the adoption of accounting guidance related to Consolidations (ASU 2015-02). At Dec. 31, 2014, risk-based capital ratios include the net impact of the total consolidated assets of certain consolidated investment management funds in risk-weighted assets ("RWAs"). These assets were not included in the Dec. 31, 2013 risk-based ratios. The leverage capital ratio was not impacted.
- (e) At Dec. 31, 2017, Dec. 31, 2016, Dec. 31, 2015 and Dec. 31, 2014, the Common Equity Tier 1 ("CET1"), Tier 1 and Total risk-based consolidated regulatory capital ratios are based on Basel III components of capital, as phased-in, and credit risk asset risk-weightings using the U.S. capital rules' advanced approaches framework (the "Advanced Approach"). The leverage capital ratio is based on Basel III's definition of Tier 1 capital, as phased-in, and quarterly average assets. The Supplementary Leverage Ratio ("SLR") is based on Tier 1 capital, as phased-in, and quarterly average assets and certain off-balance sheet exposures. The capital ratios at Dec. 31, 2013 are based on Basel I rules (including Basel I Tier 1 common in the case of the CET1 ratio). For additional information on these ratios, see "Capital" beginning on page 53.
- (f) The estimated fully phased-in CET1 and SLR ratios (Non-GAAP) are based on our interpretation of the U.S. capital rules, which are being gradually phased-in over a multi-year period. For additional information on these Non-GAAP ratios, see "Capital" beginning on page 53.

Results of Operations

General

In this Annual Report, references to “our,” “we,” “us,” “BNY Mellon,” the “Company” and similar terms refer to The Bank of New York Mellon Corporation and its consolidated subsidiaries. The term “Parent” refers to The Bank of New York Mellon Corporation but not its subsidiaries.

BNY Mellon's actual results of future operations may differ from those estimated or anticipated in certain forward-looking statements contained herein for reasons which are discussed below and under the heading “Forward-looking Statements.” When used in this Annual Report, words such as “estimate,” “forecast,” “project,” “anticipate,” “likely,” “target,” “expect,” “intend,” “continue,” “seek,” “believe,” “plan,” “goal,” “could,” “should,” “would,” “may,” “might,” “will,” “strategy,” “synergies,” “opportunities,” “trends,” “future” and words of similar meaning, may signify forward-looking statements.

Certain business terms and commonly used acronyms used in this Annual Report are defined in the Glossary and Acronyms sections.

The following should be read in conjunction with the Consolidated Financial Statements included in this report. Investors should also read the section titled “Forward-looking Statements.”

How we reported results

Throughout this Annual Report, certain measures, which are noted as “Non-GAAP financial measures,” exclude certain items or otherwise include components that differ from U.S. generally accepted accounting principles (“GAAP”). BNY Mellon believes that these measures are useful to investors because they permit a focus on period-to-period comparisons using measures that relate to our ability to enhance revenues and limit expenses in circumstances where such matters are within our control or because they provide additional information about our ability to meet fully phased-in capital requirements. Certain immaterial reclassifications have been made to prior periods to place them on a basis comparable with the current period presentation. See “Supplemental information - Explanation of GAAP and Non-GAAP financial

measures” beginning on page 118 for a reconciliation of financial measures presented on a Non-GAAP basis. See “Net interest revenue,” including the “Average balances and interest rates” beginning on page 12 for information on measures presented on a fully taxable equivalent (“FTE”) basis. Also see “Capital” beginning on page 53 for information on our fully phased-in capital requirements.

Overview

Established in 1792 by Alexander Hamilton, we were the first company listed on the New York Stock Exchange (NYSE: BK). With a more than 225-year history, BNY Mellon is a global company that manages and services assets for financial institutions, corporations and individual investors in 35 countries and more than 100 markets.

BNY Mellon has two business segments, Investment Management and Investment Services, which offer a comprehensive set of capabilities and deep expertise across the investment lifecycle, which enables the company to provide solutions to buy-side and sell-side market participants, as well as leading institutional and wealth management clients globally.

Investment Management provides investment management services to institutional and retail investors, as well as investment management, wealth and estate planning and private banking solutions to high net worth individuals and families, and foundations and endowments.

Investment Services provides business and technology solutions to financial institutions, corporations, public funds and government agencies, including: asset servicing (custody, foreign exchange, fund services, broker-dealer services, securities finance, collateral management and liquidity services), clearing services, issuer services (depository receipts and corporate trust) and treasury services (global payments, trade finance and cash management).

As of Dec. 31, 2017, BNY Mellon had \$33.3 trillion in assets under custody and/or administration (“AUC/A”), and \$1.9 trillion in assets under management (“AUM”). In 2017, the Company delivered 18%

growth in earnings per share and increased the return on common equity to nearly 11% year-over-year.

The Company continues to prioritize investments in technology and operations to increase resiliency, improve efficiency and reduce risk. Excellence in risk management is essential.

The Company maintains strong capital and liquidity positions to support the Company's business activities and client needs.

As a U. S. Global Systemically Important Bank ("G-SIB"), BNY Mellon is required to be in compliance with various capital ratios. At Dec. 31, 2017, the Advanced Approach CET1 ratio of 10.7% was above the minimum requirement of 6.5%. The Company expects the CET1 ratio to remain at least 100 basis points above the regulatory minimum requirement plus the applicable buffers.

The Company is subject to the SLR. At Dec. 31, 2017, the estimated fully phased-in SLR (Non-GAAP) of 5.9% was above the regulatory minimum of 5.0%. The Company currently expects to maintain an SLR ratio of at least 50 basis points above the regulatory minimum requirement plus the applicable buffer.

The Company's liquidity position remained strong in 2017. The liquidity coverage ratio ("LCR") averaged 118% in the fourth quarter and met the 100% fully phased-in regulatory requirement.

The Company prioritizes maintaining balance sheet strength in order to deploy capital efficiently to fuel future growth and return value to shareholders. In 2017, we returned \$3.6 billion to shareholders, consisting of \$901 million in common stock dividends and \$2.7 billion in share repurchases.

Key 2017 and subsequent events

Tax Cuts and Jobs Act of 2017

In December 2017, the Tax Cuts and Jobs Act of 2017 (hereinafter referred to as the "U.S. tax legislation" or the "Tax Act") was signed into law in the United States. The U.S. tax legislation significantly alters the tax landscape by reducing the corporate federal tax rate to 21% from 35% and shifting to a partial territorial tax system instead of a worldwide tax system, among other changes. The transition to the

new tax system triggers a one-time repatriation tax on undistributed earnings of certain foreign subsidiaries.

U.S. GAAP requires companies to recognize the effect of tax law changes on deferred tax assets and liabilities and other recognized assets in the period of enactment. As a result, the effects of the U.S. tax legislation were reflected in the fourth-quarter 2017 financial statements resulting in an estimated \$427 million or \$0.41 per common share increase in net income. The U.S. tax legislation had a negative impact on regulatory capital, resulting in a \$551 million decrease in the numerator of CET1, Tier 1 and Total capital ratios.

Our estimate of the impact of the U.S. tax legislation is based on certain assumptions and our current interpretation of the Tax Cuts and Jobs Act, and may change, possibly materially, as we refine our analysis and as further information becomes available. See "Recent Accounting Developments" and Note 10 of the Notes to Consolidated Financial Statements for additional information.

Charles W. Scharf named chief executive officer and chairman; Gerald L. Hassell, former chairman retired

In July 2017, Charles W. Scharf was appointed chief executive officer and member of the board of directors of the Company. Effective Jan. 1, 2018, Mr. Scharf became chairman of the board of directors. Mr. Scharf succeeds Gerald L. Hassell, who retired at the end of 2017.

Additional changes to leadership team

The following leadership changes were also effective on Jan. 1, 2018.

Thomas ("Todd") P. Gibbons, previously the Chief Financial Officer, was appointed Chief Executive Officer of Clearing, Markets and Client Management. Mr. Gibbons remains on the Executive Committee.

Michael P. Santomassimo was appointed Chief Financial Officer, succeeding Mr. Gibbons, and joined the Executive Committee. Mr. Santomassimo previously served as the Chief Financial Officer of Investment Services since July 2016.

See “Directors, Executive Committee and Other Executive Officers” on page 212 for a list of the Company’s leadership team.

Resolution plan

As required by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the “Dodd-Frank Act”), the Parent must submit periodically to the Board of Governors of the Federal Reserve System (“Federal Reserve”) and the Federal Deposit Insurance Corporation (“FDIC”) a plan for its rapid and orderly resolution in the event of material financial distress or failure. In December 2017, based on their review of our 2017 resolution plan, the agencies jointly decided that the Parent’s 2017 resolution plan satisfactorily addressed the identified shortcomings in its prior resolution plan. The agencies found no deficiencies or shortcomings in BNY Mellon’s 2017 plan. The public portion of our 2017 resolution plan is available on the Federal Reserve’s and FDIC’s websites.

Also, in September 2017, the Federal Reserve and FDIC extended the filing deadline by one year to July 1, 2019 for the Parent’s next resolution plan.

In connection with our single point of entry resolution strategy, we have established BNY Mellon IHC, LLC, a wholly owned direct subsidiary of the Parent, (the “IHC”), to facilitate the provision of capital and liquidity resources to certain key subsidiaries in the event of material financial distress or failure. In the second quarter of 2017, we entered into a binding support agreement that requires the IHC to provide that support. See “Liquidity and dividends” beginning on page 47 for additional information.

Disposition of CenterSquare Investment Management

In January 2018, we completed the sale of CenterSquare Investment Management (“CenterSquare”), one of our Investment Management boutiques, and recorded a small gain on the transaction. CenterSquare had approximately \$9 billion in AUM in U.S. and global real estate and infrastructure investments.

Combination of three U.S. investment managers

In November 2017, we announced that we will launch a specialist multi-asset investment manager in 2018. The new business will combine BNY Mellon’s

three largest U.S. investment managers - Mellon Capital Management (“MCM”), Standish Mellon Asset Management (“Standish”), and The Boston Company Asset Management (“TBCAM”) - to offer institutional and intermediary clients high quality single and multi-asset investment strategies in both active and passive solutions, backed by greater scale in risk management, technology and operations.

Capital plan, share repurchase program and increase in cash dividend on common stock

In June 2017, BNY Mellon received confirmation that the Federal Reserve did not object to our 2017 capital plan submitted in connection with its Comprehensive Capital Analysis and Review (“CCAR”). Our board of directors subsequently approved the repurchase of up to \$2.6 billion of common stock starting in the third quarter of 2017 and continuing through the second quarter of 2018.

Additionally, in July 2017, the board of directors approved a 26% increase in the quarterly cash dividend to \$0.24 per common share, which was also included in the 2017 capital plan. The first payment of the increased quarterly cash dividend was made on Aug. 11, 2017.

Established BNY Mellon Government Securities Services Corp.

In the second quarter of 2017, BNY Mellon established BNY Mellon Government Securities Services Corp. (“GSS Corp.”) a U.S.-based wholly owned operating subsidiary that houses the operations and technology supporting our U.S. government securities clearing and settlement and U.S. tri-party repo clearing and settlement services. The board of directors of GSS Corp. provides oversight of business affairs, operational risk and performance, as well as direction on strategic initiatives to drive industry-leading practices and processes. The board currently consists of seven members, including three independent members.

Summary of financial highlights

We reported net income applicable to common shareholders of BNY Mellon of \$3.9 billion, or \$3.72 per diluted common share, in 2017, including an estimated net benefit related to U.S. tax legislation of \$427 million, or \$0.41 per common share, and severance, litigation and other charges of \$246

million, or \$0.24 per common share, both recorded in the fourth quarter of 2017. In 2016, net income applicable to common shareholders of BNY Mellon was \$3.4 billion, or \$3.15 per diluted common share.

Highlights of 2017 results

- AUC/A totaled a record \$33.3 trillion at Dec. 31, 2017 compared with \$29.9 trillion at Dec. 31, 2016. The 11% increase primarily reflects higher market values, the favorable impact of a weaker U.S. dollar and net new business. (See “Investment Services business” beginning on page 22.)
- AUM totaled a record \$1.9 trillion at Dec. 31, 2017 compared with \$1.6 trillion at Dec. 31, 2016. The 15% increase primarily reflects higher market values, the favorable impact of a weaker U.S. dollar (principally versus the British pound) and net inflows. AUM excludes securities lending cash management assets and assets managed in the Investment Services business. (See “Investment Management business” beginning on page 18.)
- Investment services fees totaled \$7.5 billion in 2017, an increase of 3% compared with \$7.2 billion in 2016, primarily reflecting higher money market fees, equity market values and net new business, including growth in collateral management, partially offset by lost business and lower volumes in certain Depositary Receipts programs. (See “Investment Services business” beginning on page 22.)
- Investment management and performance fees totaled \$3.6 billion in 2017 compared with \$3.4 billion in 2016, an increase of 7%, primarily reflecting higher market values, money market fees and performance fees, partially offset by the unfavorable impact of a stronger U.S. dollar (principally versus the British pound). On a constant currency basis (Non-GAAP), investment management and performance fees increased 8% compared with 2016. (See “Investment Management business” beginning on page 18.)
- Foreign exchange and other trading revenue totaled \$668 million in 2017 compared with \$701 million in 2016. Foreign exchange revenue totaled \$638 million in 2017, a decrease of 7% compared with \$687 million in 2016. The decrease in foreign exchange revenue primarily reflects lower volatility, partially offset by higher volumes. (See “Fee and other revenue” beginning on page 9.)
- Net interest revenue totaled \$3.3 billion in 2017 compared with \$3.1 billion in 2016, an increase of 5%. The increase primarily reflects higher interest rates, partially offset by lower interest-earning assets driven by lower average deposits. Net interest margin was 1.14% in 2017 compared with 1.03% in 2016. Net interest margin (FTE) - Non-GAAP was 1.15% in 2017 compared with 1.05% in 2016. The increase in the net interest margin primarily reflects higher yields on interest-earning assets, partially offset by higher rates paid on interest-bearing liabilities. (See “Net interest revenue” beginning on page 12.)
- The provision for credit losses was a credit of \$24 million in 2017 and a credit of \$11 million in 2016. (See “Asset quality and allowance for credit losses” beginning on page 43.)
- Noninterest expense totaled \$11.0 billion in 2017 compared with \$10.5 billion in 2016. The 4% increase primarily reflects higher staff, software and professional, legal and other purchased services expenses. (See “Noninterest expense” beginning on page 15.)
- The provision for income taxes was \$496 million (10.8% effective tax rate) in 2017, including the estimated tax benefit of \$710 million recorded in the fourth quarter of 2017 related to U.S. tax legislation. (See “Income taxes” on page 16.)
- The net unrealized pre-tax loss on our total investment securities portfolio was \$85 million at Dec. 31, 2017, compared with a pre-tax loss of \$221 million at Dec. 31, 2016, including the impact of related hedges. The decrease in net unrealized pre-tax loss was primarily driven by a decline in long-term interest rates. (See “Investment securities” beginning on page 36.)
- Our CET1 ratio calculated under the Advanced Approach was 10.7% at Dec. 31, 2017 and 10.6% at Dec. 31, 2016. The increase primarily reflects CET1 generation, partially offset by the additional phase-in requirements under the U.S. capital rules that became effective Jan. 1, 2017 and the impact of U.S. tax legislation. (See “Capital” beginning on page 53.)
- Our estimated CET1 ratio calculated under the Advanced Approach on a fully phased-in basis (Non-GAAP) was 10.3% at Dec. 31, 2017 and 9.7% at Dec. 31, 2016. The increase primarily

reflects CET1 generation, partially offset by the impact of U.S. tax legislation. U.S. tax legislation had a negative impact on regulatory capital, resulting in a \$551 million decrease, driven by the repatriation tax, offset by the tax benefit related to the remeasurement of certain deferred tax liabilities. Our estimated CET1 ratio calculated under the Standardized Approach on a fully phased-in basis (Non-GAAP) was 11.5% at Dec. 31, 2017 and 11.3% at Dec. 31, 2016. (See “Capital” beginning on page 53.)

Results for 2016

In 2016, we reported net income applicable to common shareholders of BNY Mellon of \$3.4 billion, or \$3.15 per diluted common share. These results were primarily driven by:

- Investment services fees totaled \$7.2 billion in 2016, an increase of 2% compared with \$7.1 billion in 2015, primarily reflecting higher money market fees and securities lending revenue, partially offset by the unfavorable impact of lost business on clearing services fees, the unfavorable impact of a stronger U.S. dollar and the downsizing of the UK transfer agency business.
- Investment management and performance fees totaled \$3.35 billion in 2016 compared with \$3.44 billion in 2015, a decrease of 3%, due to the unfavorable impact of a stronger U.S. dollar (principally versus the British pound), net outflows of AUM and lower performance fees, partially offset by higher market values and money market fees.
- Foreign exchange and other trading revenue totaled \$701 million in 2016 compared with \$768 million in 2015. Foreign exchange revenue totaled \$687 million in 2016, a decrease of 8%, compared with \$743 million in 2015. The decrease in foreign exchange revenue primarily reflects the impact of clients migrating to lower margin products and lower volumes.
- The provision for credit losses was a credit of \$11 million in 2016 compared with a provision of \$160 million in 2015. The provision in 2015 was primarily driven by an impairment charge related to a court decision regarding Sentinel.
- Noninterest expense totaled \$10.5 billion in 2016 compared with \$10.8 billion in 2015. The decrease primarily reflects lower expenses in nearly all categories, driven by the favorable impact of a stronger U.S. dollar, lower staff, other, litigation and legal expenses and the benefit of the business improvement process. The decrease was partially offset by higher bank assessment charges, distribution and servicing and software expenses.

- The provision for income taxes was \$1.2 billion (24.9% effective tax rate) in 2016.

Results for 2015

In 2015, we reported net income applicable to common shareholders of BNY Mellon of \$3.1 billion, or \$2.71 per diluted common share. These results were primarily driven by:

- Investment services fees totaled \$7.1 billion primarily reflecting higher asset servicing fees, reflecting growth in collateral, broker-dealer and other asset servicing, and higher clearing services fees, primarily driven by higher mutual fund fees, partially offset by lower treasury services fees.
- Investment management and performance fees totaled \$3.4 billion, primarily reflecting the July 2015 sale of Meriten Investment Management GmbH (“Meriten”) and lower performance fees, partially offset by the impact of the January 2015 acquisition of Cutwater Asset Management (“Cutwater”) and strategic initiatives and higher money market fees and equity market values.
- Foreign exchange and other trading revenue totaled \$768 million primarily reflecting lower volumes in standing instruction programs, which were more than offset by higher volumes in the other trading programs, higher volatility and the impact of hedging activity for foreign currency placements.
- The provision for credit losses was \$160 million, primarily driven by an impairment charge related to a court decision involving Sentinel.
- Noninterest expense totaled \$10.8 billion primarily reflecting lower expenses in nearly all categories, except distribution and servicing and software expenses.
- The provision for income taxes was \$1.0 billion (23.9% effective tax rate) in 2015.

Fee and other revenue

Fee and other revenue				2017	2016
				vs.	vs.
<i>(dollars in millions, unless otherwise noted)</i>	2017	2016	2015	2016	2015
Investment services fees:					
Asset servicing (a)	\$ 4,383	\$ 4,244	\$ 4,187	3%	1 %
Clearing services	1,553	1,404	1,375	11	2
Issuer services	977	1,026	978	(5)	5
Treasury services	557	547	555	2	(1)
Total investment services fees	7,470	7,221	7,095	3	2
Investment management and performance fees	3,584	3,350	3,438	7	(3)
Foreign exchange and other trading revenue	668	701	768	(5)	(9)
Financing-related fees	216	219	220	(1)	—
Distribution and servicing	160	166	162	(4)	2
Investment and other income	64	341	316	N/M	N/M
Total fee revenue	12,162	11,998	11,999	1	—
Net securities gains	3	75	83	N/M	N/M
Total fee and other revenue	\$ 12,165	\$ 12,073	\$ 12,082	1%	— %
Fee revenue as a percentage of total revenue	78%	79%	79%		
AUM at period end (in billions) (b)	\$ 1,893	\$ 1,648	\$ 1,625	15%	1 %
AUC/A at period end (in trillions) (c)	\$ 33.3	\$ 29.9	\$ 28.9	11%	3 %

(a) Asset servicing fees include securities lending revenue of \$195 million in 2017, \$207 million in 2016 and \$176 million in 2015.

(b) Excludes securities lending cash management assets and assets managed in the Investment Services business.

(c) Includes the AUC/A of CIBC Mellon of \$1.3 trillion at Dec. 31, 2017, \$1.2 trillion at Dec. 31, 2016 and \$1.0 trillion at Dec. 31, 2015.

Fee and other revenue increased 1% compared with 2016. The increase primarily reflects higher investment management and performance fees, clearing services fees and asset servicing fees, partially offset by lower investment and other income and net securities gains.

Investment services fees

Investment services fees increased 3% compared with 2016 reflecting the following:

- Asset servicing fees increased 3%, primarily reflecting higher equity market values, net new business, including growth in collateral management, and higher money market fees, partially offset by the downsizing of the UK transfer agency business.
- Clearing services fees increased 11%, primarily driven by higher money market fees and growth in long-term mutual fund assets.
- Issuer services fees decreased 5%, primarily reflecting lost business and lower volumes from weaker cross-border settlement activity in Depositary Receipts.

- Treasury services fees increased 2%, primarily reflecting higher payment volumes, partially offset by higher compensating balance credits provided to clients, which reduces fee revenue and increases net interest revenue.

See the “Investment Services business” in “Review of businesses” for additional details.

Investment management and performance fees

Investment management and performance fees increased 7% compared with 2016. The increase primarily reflects higher market values, money market fees and performance fees, partially offset by the unfavorable impact of a stronger U.S. dollar on an average basis (principally versus the British pound). On a constant currency basis (Non-GAAP), investment management and performance fees increased 8% compared with 2016. Performance fees were \$94 million in 2017 and \$60 million in 2016.

Total AUM for the Investment Management business was \$1.9 trillion at Dec. 31, 2017, an increase of 15% compared with \$1.6 trillion at Dec. 31, 2016. The increase primarily reflects higher market values, the favorable impact of a weaker U.S. dollar (principally

versus the British pound) and net inflows. Net long-term inflows of \$33 billion in 2017 were a result of \$50 billion of inflows into actively managed strategies and \$17 billion of outflows from index strategies. Net short-term inflows totaled \$30 billion in 2017.

See the “Investment Management business” in “Review of businesses” for additional details regarding the drivers of investment management and performance fees.

Foreign exchange and other trading revenue

Foreign exchange and other trading revenue			
<i>(in millions)</i>	2017	2016	2015
Foreign exchange	\$ 638	\$ 687	\$ 743
Other trading revenue	30	14	25
Total foreign exchange and other trading revenue	\$ 668	\$ 701	\$ 768

Foreign exchange and other trading revenue decreased 5% compared with 2016.

Foreign exchange revenue is primarily driven by the volume of client transactions and the spread realized on these transactions, both of which are impacted by market volatility, and the impact of foreign currency hedging activities. In 2017, foreign exchange revenue totaled \$638 million, a decrease of 7% compared with 2016. The decrease primarily reflects lower volatility, partially offset by higher volumes. Foreign exchange revenue is primarily reported in the Investment Services business and, to a lesser extent, the Investment Management business and the Other segment.

Our custody clients may enter into foreign exchange transactions in a number of ways, including through our standing instruction programs. While the shift of custody clients from our standing instruction programs to other trading options has abated, our foreign exchange revenue continues to be impacted by changes in volume and volatility. For the year ended Dec. 31, 2017, our revenue for all types of foreign exchange trading transactions was \$638 million, or 4% of our total revenue, and approximately 27% of our foreign exchange revenue was generated by transactions in our standing instruction programs, compared with 30% in 2016 and 33% in 2015.

Total other trading revenue was \$30 million in 2017, compared with \$14 million in 2016. The increase primarily reflects higher fixed-income trading, partially offset by lower equity and credit derivatives trading. Other trading revenue is reported in all three business segments.

Financing-related fees

Financing-related fees, which are primarily reported in the Investment Services business and the Other segment, include capital markets fees, loan commitment fees and credit-related fees. Financing-related fees totaled \$216 million in 2017 compared with \$219 million in 2016 due in part to lower fees on standby letters of credit.

Distribution and servicing fees

Distribution and servicing fees earned from mutual funds are primarily based on average assets in the funds and the sales of funds that we manage or administer and are primarily reported in the Investment Management business. These fees, which include 12b-1 fees, fluctuate with the overall level of net sales, the relative mix of sales between share classes, the funds’ market values and money market fee waivers.

Distribution and servicing fees were \$160 million in 2017 compared with \$166 million in 2016. The decrease primarily reflects fees paid to introducing brokers, partially offset by higher money market fees.

Investment and other income

The following table provides the components of investment and other income.

Investment and other income			
<i>(in millions)</i>	2017	2016	2015
Corporate/bank-owned life insurance	\$ 153	\$ 149	\$ 139
Expense reimbursements from joint venture	64	67	63
Lease-related gains	56	38	45
Equity investment income (loss)	37	(10)	(19)
Seed capital gains (a)	32	44	35
Asset-related (losses) gains	(1)	10	—
Other (loss) income	(277)	43	53
Total investment and other income	\$ 64	\$ 341	\$ 316

(a) Excludes the gains (losses) on seed capital investments in consolidated investment management funds which are reflected in operations of consolidated investment management funds, net of noncontrolling interests, and were \$37 million in 2017, \$16 million in 2016 and \$18 million in 2015.

Investment and other income includes corporate and bank-owned life insurance contracts, expense reimbursements from our CIBC Mellon joint venture, and gains or losses from lease-related activity, equity investments and other assets, seed capital and other income. Expense reimbursements from our CIBC Mellon joint venture relate to expenses incurred by BNY Mellon on behalf of the CIBC Mellon joint venture. Asset-related gains include real estate, loan and other asset dispositions. Other income primarily includes foreign currency remeasurement gain (loss), other investments, including renewable energy, and various miscellaneous revenues. Investments in renewable energy generate losses in other income that are more than offset by benefits and credits recorded to the provision for income taxes.

Investment and other income was \$64 million in 2017 compared with \$341 million in 2016. The decrease primarily reflects the impact of U.S. tax legislation on our renewable energy investments. The net impact of U.S. tax legislation on renewable energy investments was de minimis to net income, as the pre-tax accounting resulted in a reduction of \$279 million to investment and other income, which was offset by the tax benefit from remeasurement of the related deferred tax liability.

Net securities gains

Net securities gains totaled \$3 million in 2017, compared with \$75 million in 2016. Net securities gains in 2017 were primarily offset by losses on the sale of certain investment securities.

2016 compared with 2015

Fee and other revenue totaled \$12.07 billion in 2016 compared with \$12.08 billion in 2015. The slight decrease primarily reflects lower investment management and performance fees and foreign exchange and other trading revenue, partially offset by higher investment services fees and investment and other income.

The increase in investment services fees primarily reflects higher asset servicing fees, issuer services fees and clearing services fees driven by higher money market fees and securities lending revenue, partially offset by the unfavorable impact of lost business on clearing services fees, the unfavorable impact of a stronger U.S. dollar and the downsizing of the UK transfer agency business.

The decrease in investment management and performance fees primarily reflects the unfavorable impact of a stronger U.S. dollar (principally versus the British pound), net outflows of AUM and lower performance fees, partially offset by higher market values and money market fees.

The decrease in foreign exchange and other trading revenue primarily reflects the impact of clients migrating to lower margin products and lower volumes.

Net interest revenue

Net interest revenue				2017	2016
				vs.	vs.
<i>(dollars in millions)</i>	2017	2016	2015	2016	2015
Net interest revenue	\$ 3,308	\$ 3,138	\$ 3,026	5%	4%
Tax equivalent adjustment	47	51	58	N/M	N/M
Net interest revenue (FTE) – Non-GAAP (a)	\$ 3,355	\$ 3,189	\$ 3,084	5%	3%
Average interest-earning assets	\$290,522	\$ 303,379	\$ 313,763	(4)%	(3)%
Net interest margin	1.14%	1.03%	0.96%	11 bps	7 bps
Net interest margin (FTE) – Non-GAAP (a)	1.15%	1.05%	0.98%	10 bps	7 bps

(a) Net interest revenue (FTE) – Non-GAAP and net interest margin (FTE) – Non-GAAP include the tax equivalent adjustments on tax-exempt income which allows for comparisons of amounts arising from both taxable and tax-exempt sources and is consistent with industry practice. The adjustment to an FTE basis has no impact on net income.

Net interest revenue increased 5% compared with 2016, primarily reflecting higher interest rates, partially offset by lower interest-earning assets driven by lower average deposits.

Net interest margin increased 11 basis points compared with 2016, primarily reflecting higher yields on interest-earning assets, partially offset by higher rates paid on interest-bearing liabilities.

Average interest-earning assets were \$291 billion in 2017 compared with \$303 billion in 2016. The decrease primarily reflects lower average interest-bearing deposits with the Federal Reserve and other central banks, driven by lower average deposits.

Average non-U.S. dollar deposits comprised approximately 30% of our average total deposits in 2017, compared with approximately 20% in 2016. Approximately 45% of the average non-U.S. dollar deposits in 2017, compared with approximately 40% in 2016, were euro-denominated.

2016 compared with 2015

Net interest revenue increased 4% compared with 2015, primarily reflecting an increase in interest rates, partially offset by lower interest-earning assets. The 7 basis point increase in the net interest margin primarily reflects higher yields on interest-earning assets, partially offset by higher rates paid on interest-bearing liabilities.

Results of Operations (continued)

Average balances and interest rates	2017		
	Average balance	Interest	Average rates
<i>(dollar amounts in millions, presented on an FTE basis)</i>			
Assets			
Interest-earning assets:			
Interest-bearing deposits with banks (primarily foreign banks)	\$ 14,879	\$ 120	0.80%
Interest-bearing deposits held at the Federal Reserve and other central banks	70,213	319	0.45
Federal funds sold and securities purchased under resale agreements	27,192	423	1.55
Margin loans	14,500	343	2.36
Non-margin loans:			
Domestic offices:			
Consumer	9,548	298	3.12
Commercial	20,976	521	2.49
Foreign offices	12,915	258	2.00
Total non-margin loans	43,439	1,077 (a)	2.48
Securities:			
U.S. government obligations	25,674	425	1.66
U.S. government agency obligations	60,268	1,195	1.98
State and political subdivisions	3,226	100	3.09
Other securities:			
Domestic offices	9,141	215	2.35
Foreign offices	19,541	150	0.77
Total other securities	28,682	365	1.27
Trading securities (primarily domestic)	2,449	62	2.54
Total securities	120,299	2,147	1.79
Total interest-earning assets	\$ 290,522	\$ 4,429	1.52%
Noninterest-earning assets	53,326		
Total assets	\$ 343,848		
Liabilities			
Interest-bearing liabilities:			
Interest-bearing deposits:			
Domestic offices:			
Money market rate accounts	\$ 7,510	\$ 4	0.06%
Savings	932	7	0.79
Demand deposits	5,892	14	0.24
Time deposits	32,574	82	0.25
Total domestic offices	46,908	107	0.23
Foreign offices:			
Banks	13,185	62	0.47
Government and official institutions	5,880	9	0.16
Other	77,150	(16)	(0.02)
Total foreign offices	96,215	55	0.06
Total interest-bearing deposits	143,123	162	0.11
Federal funds purchased and securities sold under repurchase agreements	19,653	225	1.14
Trading liabilities	1,243	7	0.57
Other borrowed funds:			
Domestic offices	1,113	21	1.86
Foreign offices	803	5	0.67
Total other borrowed funds	1,916	26	1.36
Commercial paper	2,630	29	1.08
Payables to customers and broker-dealers	18,984	64	0.34
Long-term debt	27,424	561	2.05
Total interest-bearing liabilities	\$ 214,973	\$ 1,074	0.50%
Total noninterest-bearing deposits	71,664		
Other noninterest-bearing liabilities	16,932		
Total liabilities	303,569		
Temporary equity			
Redeemable noncontrolling interests	180		
Permanent equity			
Total BNY Mellon shareholders' equity	39,687		
Noncontrolling interests	412		
Total permanent equity	40,099		
Total liabilities, temporary equity and permanent equity	\$ 343,848		
Net interest revenue (FTE) – Non-GAAP		\$ 3,355	
Net interest margin (FTE) – Non-GAAP			1.15%
Less: Tax equivalent adjustment (b)		47	
Net interest revenue		\$ 3,308	
Net interest margin			1.14%
Percentage of assets attributable to foreign offices (c)	30%		
Percentage of liabilities attributable to foreign offices (c)	35		

Note: Interest and average rates were calculated on a taxable equivalent basis using dollar amounts in thousands and actual number of days in the year.

- (a) Includes fees of \$9 million in 2017. Non-accrual loans are included in average loans; the associated income, which was recognized on a cash basis, is included in interest income.
- (b) The tax equivalent adjustment relates to tax-exempt securities, primarily state and political subdivisions, based on the U.S. federal statutory tax rate of 35%, adjusted for applicable state income taxes, net of the related federal tax benefit.
- (c) Includes the Cayman Islands branch office.

Results of Operations (continued)

Average balances and interest rates (continued)	2016			2015		
	Average balance	Interest	Average rates	Average balance	Interest	Average rates
<i>(dollar amounts in millions, presented on an FTE basis)</i>						
Assets						
Interest-earning assets:						
Interest-bearing deposits with banks (primarily foreign banks)	\$ 14,704	\$ 104	0.70%	\$ 20,531	\$ 104	0.51%
Interest-bearing deposits held at the Federal Reserve and other central banks	80,593	198	0.25	83,029	170	0.20
Federal funds sold and securities purchased under resale agreements	25,767	233	0.91	23,384	147	0.63
Margin loans	18,201	265	1.46	19,917	207	1.04
Non-margin loans:						
Domestic offices:						
Consumer	8,483	259	3.05	7,145	217	3.03
Commercial	21,820	417	1.91	19,647	346	1.76
Foreign offices	13,177	197	1.50	13,963	164	1.18
Total non-margin loans	43,480	873 (a)	2.01	40,755	727 (a)	1.78
Securities:						
U.S. government obligations	25,074	378	1.51	25,904	378	1.46
U.S. government agency obligations	56,384	986	1.75	55,044	967	1.76
State and political subdivisions	3,703	110	2.96	4,712	128	2.73
Other securities:						
Domestic offices	12,326	210	1.71	14,644	302	2.06
Foreign offices	20,664	206	1.00	22,889	176	0.77
Total other securities	32,990	416	1.26	37,533	478	1.27
Trading securities (primarily domestic)	2,483	63	2.56	2,954	78	2.65
Total securities	120,634	1,953	1.62	126,147	2,029	1.61
Total interest-earning assets	\$ 303,379	\$ 3,626	1.20%	\$ 313,763	\$ 3,384	1.08%
Noninterest-earning assets	55,098			58,424		
Total assets	\$ 358,477			\$ 372,187		
Liabilities						
Interest-bearing liabilities:						
Interest-bearing deposits:						
Domestic offices:						
Money market rate accounts	\$ 7,780	\$ 4	0.06%	\$ 7,272	\$ 6	0.08%
Savings	1,191	4	0.37	1,312	4	0.28
Demand deposits	2,520	7	0.28	2,792	6	0.23
Time deposits	43,056	26	0.06	44,162	14	0.03
Total domestic office	54,547	41	0.08	55,538	30	0.06
Foreign offices:						
Banks	13,130	12	0.09	16,626	10	0.06
Government and official institutions	4,159	—	0.01	5,591	—	—
Other	85,110	(37)	(0.04)	87,341	(3)	—
Total foreign offices	102,399	(25)	(0.02)	109,558	7	0.01
Total interest-bearing deposits	156,946	16	0.01	165,096	37	0.02
Federal funds purchased and securities sold under repurchase agreements	14,489	36	0.25	16,452	(6)	(0.04)
Trading liabilities	711	6	0.89	634	9	1.39
Other borrowed funds:						
Domestic offices	93	4	4.15	162	4	2.77
Foreign offices	753	4	0.51	652	5	0.71
Total other borrowed funds	846	8	0.91	814	9	1.12
Commercial paper	1,337	5	0.37	1,549	2	0.10
Payables to customers and broker-dealers	16,925	12	0.07	11,649	7	0.06
Long-term debt	23,334	354	1.52	20,832	242	1.16
Total interest-bearing liabilities	\$ 214,588	\$ 437	0.20%	\$ 217,026	\$ 300	0.14%
Total noninterest-bearing deposits	82,712			86,338		
Other noninterest-bearing liabilities	21,928			29,959		
Total liabilities	319,228			333,323		
Temporary equity						
Redeemable noncontrolling interests	182			240		
Permanent equity						
Total BNY Mellon shareholders' equity	38,489			37,812		
Noncontrolling interests	578			812		
Total permanent equity	39,067			38,624		
Total liabilities, temporary equity and permanent equity	\$ 358,477			\$ 372,187		
Net interest revenue (FTE) – Non-GAAP		\$ 3,189		\$ 3,084		
Net interest margin (FTE) – Non-GAAP			1.05%			0.98%
Less: Tax equivalent adjustment (b)		51		58		
Net interest revenue		\$ 3,138		\$ 3,026		
Net interest margin			1.03%			0.96%
Percentage of assets attributable to foreign offices (c)	29%			30%		
Percentage of liabilities attributable to foreign offices (c)	36			37		

Note: Interest and average rates were calculated on a taxable equivalent basis using dollar amounts in thousands and actual number of days in the year.

(a) Includes fees of \$10 million in 2016 and \$21 million in 2015. Non-accrual loans are included in the average loans; the associated income, which was recognized on a cash basis, is included in interest income.

(b) The tax equivalent adjustment relates to tax-exempt securities, primarily state and political subdivisions, based on the U.S. federal statutory tax rate of 35%, adjusted for applicable state income taxes, net of the related federal tax benefit.

(c) Includes the Cayman Islands branch office.

Noninterest expense

Noninterest expense				2017	2016
				vs.	vs.
<i>(dollars in millions)</i>	2017	2016	2015	2016	2015
Staff	\$ 5,972	\$ 5,733	\$ 5,837	4%	(2)%
Professional, legal and other purchased services	1,274	1,185	1,230	8	(4)
Software	744	647	627	15	3
Net occupancy	569	590	600	(4)	(2)
Distribution and servicing	419	405	381	3	6
Sub-custodian	250	245	270	2	(9)
Furniture and equipment	241	247	280	(2)	(12)
Business development	229	245	267	(7)	(8)
Bank assessment charges	220	219	157	—	39
Other	724	721	804	—	(10)
Amortization of intangible assets	209	237	261	(12)	(9)
M&I, litigation and restructuring charges	106	49	85	N/M	N/M
Total noninterest expense	\$ 10,957	\$ 10,523	\$ 10,799	4%	(3)%
Staff expense as a percentage of total revenue	38%	38 %	38 %		
Full-time employees at period end	52,500	52,000	51,200	1%	2 %
Memo:					
Adjusted total noninterest expense excluding amortization of intangible assets and M&I, litigation and restructuring charges – Non-GAAP	\$ 10,642	\$ 10,237	\$ 10,453	4%	(2)%

Total noninterest expense increased 4% compared with 2016. The increase primarily reflects higher staff, software and professional, legal and other purchased services expenses.

We expect our technology-related expenses, including staff expense, to increase as a result of our continued investment in technology infrastructure and platforms. We also expect to incur expenses in 2018 as a result of additional severance charges and other actions that we may take after completing our review of our businesses, as well as the continued execution of our real estate strategy.

Staff expense

Staff expense consists of:

- compensation expense, which includes:
 - salary expense, primarily driven by headcount;
 - the cost of temporary services and overtime; and
 - severance expense;
- incentive expense, which includes:
 - additional compensation earned under incentive plans designed to reward a combination of individual, business unit and corporate performance goals; as well as,
 - stock-based compensation expense; and

- employee benefit expense, primarily payroll taxes, medical benefits, retirement benefits and pension expense.

Staff expense increased 4% compared with 2016.

The increase primarily reflects higher incentive expense, driven by stronger performance, the annual employee merit increase and higher severance expense, partially offset by the favorable impact of a stronger U.S. dollar.

Non-staff expense

Non-staff expense includes certain expenses that vary with the levels of business activity and business investments. Non-staff expenses also include corporate activities related to technology, compliance, legal, productivity initiatives and business development.

Non-staff expense totaled \$5.0 billion in 2017, an increase of 4% compared with 2016. The increase primarily reflects higher software and professional, legal and other purchased services expenses. The increase in software expense primarily reflects asset impairments and increased amortization. The increase in professional, legal and other purchased services expense primarily reflects higher consulting and purchased services expenses.

2016 compared with 2015

Noninterest expense decreased 3%, compared with 2015. The decrease primarily reflects lower expenses in nearly all categories, driven by the favorable impact of a stronger U.S. dollar, lower staff, other, litigation and legal expenses and the benefit of the business improvement process. The decrease was partially offset by higher bank assessment charges, distribution and servicing and software expenses.

Income taxes

BNY Mellon recorded an income tax provision of \$496 million (10.8% effective tax rate) in 2017, including the estimated tax benefit of \$710 million recorded in the fourth quarter of 2017 related to U.S. tax legislation. The income tax provision was \$1.2 billion (24.9% effective tax rate) in 2016 and \$1.0 billion (23.9% effective tax rate) in 2015. For additional information, see Note 10 of the Notes to Consolidated Financial Statements.

We expect the effective tax rate to be approximately 21% in 2018 based on current income tax rates.

Review of businesses

We have an internal information system that produces performance data along product and service lines for our two principal businesses, Investment Management and Investment Services, and the Other segment.

Business accounting principles

Our business data has been determined on an internal management basis of accounting, rather than the generally accepted accounting principles used for consolidated financial reporting. These measurement principles are designed so that reported results of the businesses will track their economic performance.

For information on the accounting principles of our businesses, the primary types of revenue by business and how our businesses are presented and analyzed,

see Note 22 of the Notes to Consolidated Financial Statements.

Business results are subject to reclassification when organizational changes are made. There were no significant organizational changes in 2017. The results are also subject to refinements in revenue and expense allocation methodologies, which are typically reflected on a prospective basis.

The results of our businesses may be influenced by client and other activities that vary by quarter. In the first quarter, incentives expense typically increases reflecting the vesting of long-term stock awards for retirement-eligible employees. In the third quarter, Depositary Receipts revenue is typically higher due to an increased level of client dividend payments. Also in the third quarter, volume-related fees may decline due to reduced client activity. In the third quarter, staff expense typically increases reflecting the annual employee merit increase. In the fourth quarter, we typically incur higher business development and marketing expenses. In our Investment Management business, performance fees are typically higher in the fourth quarter, as the fourth quarter represents the end of the measurement period for many of the performance fee-eligible relationships.

The results of our businesses may also be impacted by the translation of financial results denominated in foreign currencies to the U.S. dollar. We are primarily impacted by activities denominated in the British pound and the euro. On a consolidated basis and in our Investment Services business, we typically have more foreign currency denominated expenses than revenues. However, our Investment Management business typically has more foreign currency denominated revenues than expenses. Overall, currency fluctuations impact the year-over-year growth rate in the Investment Management business more than the Investment Services business. However, currency fluctuations, in isolation, are not expected to significantly impact net income on a consolidated basis.

Results of Operations (continued)

The following table presents key market metrics at period end and on an average basis.

Key market metrics	2017	2016	2015	Increase (Decrease)	
				2017 vs. 2016	2016 vs. 2015
Standard & Poor's ("S&P") 500 Index (a)	2674	2239	2044	19 %	10 %
S&P 500 Index – daily average	2449	2095	2061	17	2
FTSE 100 Index (a)	7688	7143	6242	8	14
FTSE 100 Index – daily average	7380	6474	6590	14	(2)
MSCI EAFE (a)	2051	1684	1716	22	(2)
MSCI EAFE – daily average	1887	1645	1810	15	(9)
Barclays Capital Global Aggregate Bond SM Index (a)(b)	485	451	442	8	2
NYSE and NASDAQ share volume (in billions)	752	797	776	(6)	3
JPMorgan G7 Volatility Index – daily average (c)	8.41	10.54	9.97	(20)	6
Average interest on excess reserves paid by the Federal Reserve	1.10%	0.51%	0.26%	59 bps	25 bps
Foreign exchange rates vs. U.S. dollar:					
British pound (a)	\$ 1.35	\$ 1.23	\$ 1.48	10 %	(17) %
British pound – average rate	1.29	1.35	1.53	(4)	(12)
Euro (a)	1.20	1.05	1.09	14	(4)
Euro – average rate	1.14	1.11	1.11	3	—

(a) Period end.

(b) Unhedged in U.S. dollar terms.

(c) The JPMorgan G7 Volatility Index is based on the implied volatility in 3-month currency options.

Fee revenue in Investment Management, and to a lesser extent in Investment Services, is impacted by the value of market indices. At Dec. 31, 2017, we estimate that a 5% change in global equity markets, spread evenly throughout the year, would impact fee revenue by less than 1% and diluted earnings per common share by \$0.03 to \$0.05.

See Note 22 of the Notes to Consolidated Financial Statements for the consolidating schedules which show the contribution of our businesses to our overall profitability.

Investment Management business

				2017	2016	2015	2017	2016
				vs.			vs.	
<i>(dollars in millions)</i>				2016			2015	
Revenue:								
Investment management fees:								
Mutual funds	\$	1,286	\$	1,210	\$	1,208	6 %	— %
Institutional clients		1,455		1,380		1,425		(3)
Wealth management		687		642		630		2
Investment management fees (a)		3,428		3,232		3,263		(1)
Performance fees		94		60		97		(38)
Investment management and performance fees		3,522		3,292		3,360		(2)
Distribution and servicing		207		192		152		26
Other (a)		(61)		(60)		75		N/M
Total fee and other revenue (a)		3,668		3,424		3,587		(5)
Net interest revenue		329		327		319		3
Total revenue		3,997		3,751		3,906		(4)
Provision for credit losses		2		6		(1)		N/M
Noninterest expense (ex. amortization of intangible assets)		2,794		2,696		2,762		(2)
Amortization of intangible assets		60		82		97		(27)
Total noninterest expense		2,854		2,778		2,859		(3)
Income before taxes	\$	1,141	\$	967	\$	1,048	18 %	(8)%
Income before taxes (ex. amortization of intangible assets) – Non-GAAP	\$	1,201	\$	1,049	\$	1,145	14 %	(8)%
Pre-tax operating margin		29%		26%		27%		
Adjusted pre-tax operating margin – Non-GAAP (b)		34%		32%		32%		

Average balances:

Average loans	\$	16,565	\$	15,015	\$	12,545	10 %	20 %
Average deposits	\$	13,615	\$	15,650	\$	15,160	(13)%	3 %

- (a) Total fee and other revenue includes the impact of the consolidated investment management funds, net of noncontrolling interests. See page 121 for a breakdown of the revenue line items in the Investment Management business impacted by the consolidated investment management funds. Additionally, other revenue includes asset servicing, treasury services, foreign exchange and other trading revenue and investment and other income.
- (b) Excludes amortization of intangible assets, provision for credit losses and distribution and servicing expense. See “Supplemental information – Explanation of GAAP and Non-GAAP financial measures” beginning on page 118 for the reconciliation of this Non-GAAP measure.

Results of Operations (continued)

AUM trends (a)(b)					
<i>(dollars in billions)</i>					
	2017	2016	2015	2014	2013
AUM at period end, by product type: (b)					
Equity	\$ 161	\$ 153	\$ 160	\$ 183	\$ 196
Fixed income	206	186	196	193	187
Index	350	312	319	351	318
Liability-driven investments (c)	667	554	511	501	403
Multi-asset and alternative investments	214	181	167	167	162
Cash	295	262	272	291	291
Total AUM	\$ 1,893	\$ 1,648	\$ 1,625	\$ 1,686	\$ 1,557
AUM at period end, by client type:					
Institutional	\$ 1,346	\$ 1,182	\$ 1,127	\$ 1,164	\$ 1,047
Mutual funds	453	381	420	438	426
Private client	94	85	78	84	84
Total AUM	\$ 1,893	\$ 1,648	\$ 1,625	\$ 1,686	\$ 1,557
Changes in AUM: (b)					
Beginning balance of AUM	\$ 1,648	\$ 1,625	\$ 1,686	\$ 1,557	\$ 1,349
Net inflows (outflows):					
Long-term strategies:					
Equity	(14)	(15)	(31)	(9)	1
Fixed income	6	(5)	(1)	3	12
Liability-driven investments (c)	50	26	35	46	65
Multi-asset and alternative investments	8	12	9	2	2
Total long-term active strategies inflows	50	18	12	42	80
Index	(17)	(32)	(29)	5	18
Total long-term strategies inflows (outflows)	33	(14)	(17)	47	98
Short-term strategies:					
Cash	30	(9)	(18)	1	5
Total net inflows (outflows)	63	(23)	(35)	48	103
Net market impact/other	106	181	(8)	122	94
Net currency impact	76	(137)	(36)	(41)	11
Acquisition	—	2	18	—	—
Ending balance of AUM	\$ 1,893	\$ 1,648	\$ 1,625	\$ 1,686	\$ 1,557

(a) Excludes securities lending cash management assets and assets managed in the Investment Services business.

(b) In 2017, the AUM in our Wealth Management business and our multi-asset strategies has been reclassified into multi-asset and alternative investments. This reclassification does not change total AUM. All prior periods have been restated.

(c) Includes currency overlay AUM.

Business description

With \$1.9 trillion under management, our Investment Management business is the seventh largest global asset manager and includes our Wealth Management business and specialist investment boutiques.

Our Investment Management boutiques deliver a highly diversified portfolio of investment strategies independently, and through our global distribution network, to institutional and retail clients globally. The boutiques offer a broad range of actively managed equity, fixed income, alternative and liability-driven investments, along with passive products and cash management. Each boutique follows its own investment approach to innovate and develop investment solutions designed to deliver performance returns and outcomes that meet the investing goals of an increasingly sophisticated client

base. Our multi-boutique model is designed to provide the best elements of investment focus and infrastructure at scale for the benefit of clients.

BNY Mellon completed the sale of CenterSquare Investment Management in early 2018 and announced the consolidation of Mellon Capital Management, Standish Mellon Asset Management, and The Boston Company Asset Management effective in the first quarter of 2018.

In addition to the investment boutiques, Investment Management has multiple global distribution entities which are responsible for distributing investment products manufactured by the investment boutiques. In addition, The Dreyfus Corporation and its affiliate, MBSC Securities Corporation, are responsible for management and distribution of our U.S. mutual funds, and certain offshore money market funds.

BNY Mellon Wealth Management provides investment management, custody, wealth and estate planning and private banking services, and conducts business globally. BNY Mellon Wealth Management has more than \$200 billion in total private client assets as of Dec. 31, 2017, and an extensive network of offices in the U.S. and internationally.

The results of the Investment Management business are driven by the period end, average and mix of AUM, as well as the level of activity in client accounts. The overall level of AUM for a given period is determined by:

- the beginning level of AUM;
- the net flows of new assets during the period resulting from new business wins and existing client enrichments, reduced by the loss of clients and withdrawals; and
- the impact of market price appreciation or depreciation, acquisitions or divestitures and foreign exchange rates.

The mix of AUM is determined principally by client asset allocation decisions among equity, fixed income, passive products, cash, liability-driven investments and multi-asset and alternative investments.

Managed equity assets typically generate higher percentage fees than liability-driven investments and fixed-income assets. Also, actively managed assets typically generate higher management fees than indexed or passively managed assets of the same type.

Investment management fees are dependent on the overall level and mix of AUM and the management fees expressed in basis points (one-hundredth of one percent) charged for managing those assets. Management fees are typically subject to fee schedules based on the overall level of assets managed for a single client or by individual asset class and style. This is most common for institutional clients where we typically manage substantial assets for individual accounts.

Performance fees are generally calculated as a percentage of a portfolio's performance in excess of a benchmark index or a peer group's performance.

A key driver of organic growth in investment management and performance fees is the amount of

net new AUM flows. Overall market conditions are also key drivers, with a significant long-term economic driver being growth of global financial assets.

Net interest revenue is determined by loan and deposit volumes and the interest rate spread between customer rates and internal funds transfer rates on loans and deposits. Expenses in the Investment Management business are mainly driven by staffing costs, incentives and distribution and servicing expense.

Review of financial results

AUM increased 15% compared with Dec. 31, 2016 primarily reflecting higher market values, the favorable impact of a weaker U.S. dollar (principally versus the British pound) and net inflows.

Net long-term inflows of \$33 billion in 2017 were a result of \$50 billion of inflows into actively managed strategies, primarily liability-driven investments, and \$17 billion of outflows from index strategies. Net short-term inflows were \$30 billion in 2017. Market and regulatory trends have resulted in increased demand for lower fee asset management products, and for performance-based fees.

Total revenue was \$4.0 billion, an increase of 7% compared with 2016. The increase primarily reflects higher investment management and performance fees.

Revenue generated in the Investment Management business included 41% from non-U.S. sources in both 2017 and 2016.

Investment management fees in the Investment Management business increased 6% compared with 2016. The increase reflects higher equity market values and money market fees, partially offset by the unfavorable impact of a stronger U.S. dollar (principally versus the British pound). On a constant currency basis, investment management fees increased 7% (Non-GAAP) compared with 2016.

Performance fees increased 57% compared with 2016 primarily reflecting liability-driven investment strategies.

Distribution and servicing fees increased 8% compared with 2016 primarily reflecting higher money market fees.

Other revenue decreased slightly compared with 2016, reflecting higher payments to Investment Services related to higher money market fees, primarily offset by lower losses on hedging activity.

Net interest revenue increased 1% compared with 2016. The increase primarily reflects higher interest rates and average loans, partially offset by lower average deposits. Average loans increased 10% compared with 2016, while average deposits decreased 13% compared with 2016.

Noninterest expense, excluding amortization of intangible assets, was \$2.8 billion, an increase of \$98 million, or 4%, compared with 2016. The increase compared with 2016 primarily reflects higher incentive, distribution and servicing and severance expenses, partially offset by the favorable impact of a stronger U.S. dollar.

2016 compared with 2015

Income before taxes decreased 8% compared with 2015, primarily reflecting revenue decline of 4%, partially offset by a 2% decrease in noninterest expense, excluding amortization of intangible assets. Fee and other revenue decreased 5% primarily reflecting lower investment management and performance fees and losses on hedging activity. The decrease in investment management and performance fees primarily reflects the unfavorable impact of a stronger U.S. dollar and net outflows, partially offset by higher money market fees and higher market values. Net interest revenue increased 3% primarily due to higher average loans and higher rates on deposits, partially offset by the 2016 change in internal crediting rates. Noninterest expense, excluding amortization of intangible assets, decreased \$66 million, or 2%, primarily driven by the favorable impact of a stronger U.S. dollar and lower incentive expense, partially offset by higher distribution and servicing expense as a result of lower money market fee waivers.

Results of Operations (continued)

Investment Services business

				2017	2016
				vs.	vs.
(dollar amounts in millions, unless otherwise noted)	2017	2016	2015	2016	2015
Revenue:					
Investment services fees:					
Asset servicing	\$ 4,286	\$ 4,141	\$ 4,098	4 %	1 %
Clearing services	1,549	1,399	1,370	11	2
Issuer services	975	1,024	976	(5)	5
Treasury services	555	541	546	3	(1)
Total investment services fees	7,365	7,105	6,990	4	2
Foreign exchange and other trading revenue	620	663	722	(6)	(8)
Other (a)	542	531	465	2	14
Total fee and other revenue	8,527	8,299	8,177	3	1
Net interest revenue	3,058	2,797	2,622	9	7
Total revenue	11,585	11,096	10,799	4	3
Provision for credit losses	(7)	8	28	N/M	N/M
Noninterest expense (ex. amortization of intangible assets)	7,598	7,187	7,340	6	(2)
Amortization of intangible assets	149	155	162	(4)	(4)
Total noninterest expense	7,747	7,342	7,502	6	(2)
Income before taxes	\$ 3,845	\$ 3,746	\$ 3,269	3 %	15 %
Income before taxes (ex. amortization of intangible assets) – Non-GAAP	\$ 3,994	\$ 3,901	\$ 3,431	2 %	14 %
Pre-tax operating margin	33%	34%	30%		
Adjusted pre-tax operating margin (ex. provision for credit losses and amortization of intangible assets) – Non-GAAP	34%	35%	32%		
Investment services fees as a percentage of noninterest expense (ex. amortization of intangible assets)	97%	99%	95%		
Securities lending revenue	\$ 168	\$ 170	\$ 153	(1)%	11 %
Metrics:					
Average loans	\$ 40,142	\$ 44,740	\$ 45,743	(10)%	(2)%
Average deposits	\$ 200,235	\$ 217,882	\$ 233,833	(8)%	(7)%
AUC/A at period end (in trillions) (b)	\$ 33.3	\$ 29.9	\$ 28.9	11 %	3 %
Market value of securities on loan at period end (in billions) (c)	\$ 408	\$ 296	\$ 277	38 %	7 %
Asset servicing:					
Estimated new business wins (AUC/A) (in billions)	\$ 1,002	\$ 498	\$ 1,191		
Clearing services:					
Average active clearing accounts (U.S. platform) (in thousands)	6,137	5,949	6,023	3 %	(1)%
Average long-term mutual fund assets (U.S. platform)	\$ 487,845	\$ 431,937	\$ 451,924	13 %	(4)%
Average investor margin loans (U.S. platform)	\$ 9,810	\$ 10,772	\$ 11,627	(9)%	(7)%
Depository Receipts:					
Number of sponsored programs	886	1,062	1,145	(17)%	(7)%
Broker-Dealer:					
Average tri-party repo balances (in billions)	\$ 2,502	\$ 2,183	\$ 2,156	15 %	1 %

(a) Other revenue includes investment management fees, financing-related fees, distribution and servicing revenue and investment and other income.

(b) Includes the AUC/A of CIBC Mellon of \$1.3 trillion at Dec. 31, 2017, \$1.2 trillion at Dec. 31, 2016 and \$1.0 trillion at Dec. 31, 2015.

(c) Represents the total amount of securities on loan in our agency securities lending program managed by the Investment Services business. Excludes securities for which BNY Mellon acts as agent on behalf of CIBC Mellon clients, which totaled \$71 billion at Dec. 31, 2017, \$63 billion at Dec. 31, 2016 and \$55 billion at Dec. 31, 2015.

Business description

BNY Mellon Investment Services provides business and technology solutions across the investments process to entities including financial institutions, corporations, foundations and endowments, public funds and government agencies.

We are one of the leading global investment services providers with \$33.3 trillion of AUC/A at Dec. 31, 2017.

- We are the primary provider of U.S. government securities clearance and a provider of non-U.S. government securities clearance. We provide services to settle securities transactions in approximately 100 markets.
- We are a leading provider of tri-party repo collateral management services with approximately \$2.5 trillion serviced globally including approximately \$1.7 trillion of the U.S. tri-party repo market.
- Our agency securities lending program is one of the largest lenders of U.S. and non-U.S. securities, servicing a lendable asset pool of approximately \$3.4 trillion in 34 separate markets.
- We serve as trustee and/or paying agent on more than 50,000 debt-related issuances globally.
- As one of the largest providers of depositary receipts services in the world, we served as depositary for 886 sponsored American and global depositary receipts programs at Dec. 31, 2017, acting in partnership with leading companies from 58 countries.

We offer asset servicing, clearing services, issuer services and treasury services to our clients. BNY Mellon's comprehensive suite of asset servicing solutions includes: custody, foreign exchange, fund services, securities finance, investment manager outsourcing, performance and risk analytics, alternative investment services, broker-dealer services, collateral management and liquidity services.

As one of the largest fund accounting providers and a trusted partner, we offer services for the safekeeping of assets in capital markets globally. These services include financial reporting, tax reporting services, calculating and reporting net asset values ("NAVs"),

computing yields, maintaining brokerage account records, and providing administrative support to clients so they may meet their Securities and Exchange Commission ("SEC") and other compliance requirements.

Our alternative investment services and structured products business provides a full range of solutions for alternative investment managers, including prime custody, fund accounting, and client and regulatory reporting services. We also support exchange-traded funds and unit investment trusts, providing fund administration, custody, basket creation and dissemination, authorized participant interaction and order processing, among other services.

Securities finance delivers securities lending and financing solutions on both an agency and principal basis. The products support a diverse group of client segments, including pension funds, asset managers (including hedge and liquid alternative funds), sovereigns and other institutional clients.

In liquidity services, our market leading portal enables cash investments for institutional clients via money market funds, deposit products, and direct investments in money market securities, and includes fund research and analytics.

Our broker-dealer services business clears and settles equity and fixed-income transactions globally and serves as custodian for tri-party repo collateral worldwide.

Clearing services, primarily Pershing LLC, an indirect subsidiary of BNY Mellon ("Pershing") and its affiliates, provides business and technology solutions to financial organizations globally, delivering dependable operational support, robust trading services, flexible technology, an expansive array of investment and retirement solutions, practice management support and service excellence. We have approximately 1,400 clients and we effectively serve their more than 100,000 advisors and staff, 7 million accounts, and over \$1 trillion in client assets.

Our collateral services include collateral management, administration and segregation. We offer innovative solutions and industry expertise which helps financial institutions and institutional investors to mine opportunities from liquidity, financing, risk and balance sheet challenges.

Our corporate trust business delivers a full range of issuer and related investor services, including trustee, paying agency, fiduciary, escrow and other financial services. We are a leading provider to the debt capital markets, providing customized and market-driven solutions to investors, bondholders and lenders.

Our treasury services include customizable solutions and innovative technology that deliver high-quality cash management, payment and trade support for corporate and institutional global treasury needs.

We also provide credit facilities and solutions to support our clients globally.

Role of BNY Mellon, as a trustee, for mortgage-backed securitizations

BNY Mellon acts as trustee and document custodian for certain mortgage-backed security (“MBS”) securitization trusts. The role of trustee for MBS securitizations is limited; our primary role as trustee is to calculate and distribute monthly bond payments to bondholders. As a document custodian, we hold the mortgage, note, and related documents provided to us by the loan originator or seller and provide periodic reporting to these parties. BNY Mellon, either as document custodian or trustee, does not receive mortgage underwriting files (the files that contain information related to the creditworthiness of the borrower). As trustee or custodian, we have no responsibility or liability for the quality of the portfolio; we are liable only for performance of our limited duties as described above and in the trust documents. BNY Mellon is indemnified by the servicers or directly from trust assets under the governing agreements. BNY Mellon may appear as the named plaintiff in legal actions brought by servicers in foreclosure and other related proceedings because the trustee is the nominee owner of the mortgage loans within the trusts.

BNY Mellon also has been named as a defendant in legal actions brought by MBS investors alleging that the trustee has expansive duties under the governing agreements, including to investigate and pursue claims against other parties to the MBS transaction. For additional information on our legal proceedings related to this matter, see Note 20 of the Notes to Consolidated Financial Statements.

Review of financial results

AUC/A increased 11% compared with Dec. 31, 2016 to a record \$33.3 trillion, reflecting higher market values, the favorable impact of a weaker U.S. dollar and net new business. AUC/A consisted of 37% equity securities and 63% fixed-income securities at Dec. 31, 2017, compared with 34% equity securities and 66% fixed-income securities at Dec. 31, 2016.

Investment services fees were \$7.4 billion, an increase of 4% compared with 2016 and, reflecting the following factors:

- Asset servicing fees (custody, fund services, broker-dealer services, securities finance, collateral management and liquidity services) were \$4.3 billion compared with \$4.1 billion in 2016. The increase compared with 2016 primarily reflects higher equity market values, net new business, including growth in collateral management, and higher money market fees, partially offset by the downsizing of the UK transfer agency business.
- Clearing services fees were \$1.5 billion compared with \$1.4 billion in 2016. The increase compared with 2016 was primarily driven by higher money market fees and growth in long-term mutual fund assets.
- Issuer services fees (Depository Receipts and Corporate Trust) were \$975 million compared with \$1.0 billion in 2016. The decrease compared with 2016 primarily reflects lost business and lower volumes from weaker cross-border settlement activity in Depository Receipts.
- Treasury services fees (global payments, trade finance and cash management) were \$555 million compared with \$541 million in 2016 primarily reflecting higher payment volumes, partially offset by higher compensating balance credits provided to clients, which reduces fee revenue and increases net interest revenue.

Market and regulatory trends are driving investable assets toward lower fee asset management products at reduced margins for our clients. These dynamics are also negatively impacting our investment services fees. However, at the same time, these trends are providing additional outsourcing opportunities as clients and other market participants seek to comply with new regulations and reduce their operating costs.

Foreign exchange and other trading revenue totaled \$620 million compared with \$663 million in 2016. The decrease primarily reflects lower volatility, partially offset by higher volumes.

Other revenue was \$542 million compared with \$531 million in 2016. The increase primarily reflects higher payments from Investment Management related to higher money market fees, partially offset by certain fees paid to introducing brokers.

Net interest revenue was \$3.1 billion compared with \$2.8 billion in 2016. The increase primarily reflects higher interest rates, partially offset by lower average deposit and loan balances.

Noninterest expense, excluding amortization of intangible assets, was \$7.6 billion compared with \$7.2 billion in 2016. The increase primarily reflects higher staff expense, including severance, litigation, additional technology-related costs and asset impairments.

Other segment

2016 compared with 2015

Income before taxes was \$3.7 billion in 2016 compared with \$3.3 billion in 2015. Income before taxes, excluding amortization of intangible assets (Non-GAAP), increased \$470 million, or 14%. Fee and other revenue increased \$122 million, or 1%, compared with 2015, reflecting higher investment services fees driven by higher issuer services, asset servicing and clearing services fees, primarily reflecting higher money market fees, and higher other revenue related to higher payments from Investment Management, partially offset by lower foreign exchange and other trading revenue. The \$175 million increase in net interest revenue primarily reflects changes in internal crediting rates for deposits, partially offset by a decrease in average deposit balances. Noninterest expense, excluding intangible amortization, decreased \$153 million, or 2%, compared with 2015, primarily due to lower litigation, temporary services, sub-custodian, legal and other purchased services expenses, partially offset by higher bank assessment charges.

<i>(in millions)</i>	2017	2016	2015
Revenue:			
Fee and other revenue	\$ 7	\$ 366	\$ 336
Net interest (expense) revenue	(79)	14	85
Total revenue	(72)	380	421
Provision for credit losses	(19)	(25)	133
Noninterest expense (ex. amortization of intangible assets and M&I and restructuring charges (recoveries))	345	390	434
Amortization of intangible assets	—	—	2
M&I and restructuring charges (recoveries)	2	4	(2)
Total noninterest expense	347	394	434
(Loss) income before taxes	\$ (400)	\$ 11	\$ (146)
(Loss) income before taxes (ex. amortization of intangible assets, M&I and restructuring charges (recoveries)) – Non-GAAP	\$ (398)	\$ 15	\$ (146)
Average loans and leases	\$ 1,232	\$ 1,926	\$ 2,384

Description of segment

The Other segment primarily includes:

- the leasing portfolio;
- corporate treasury activities, including our investment securities portfolio;
- derivatives and other trading activity;
- corporate and bank-owned life insurance;
- renewable energy investments; and

- business exits.

Revenue primarily reflects:

- net interest revenue and lease-related gains (losses) from leasing operations;
- net interest revenue from corporate treasury activity;
- fee and other revenue from corporate and bank-owned life insurance and business exits; and

- gains (losses) associated with investment securities and other assets, including renewable energy.

Expenses include:

- M&I expenses and corporate-level restructuring charges;
- direct expenses supporting leasing, investing, and funding activities; and
- expenses not directly attributable to the Investment Management and Investment Services operations.

Review of financial results

Loss before taxes was \$400 million in 2017 compared with income before taxes of \$11 million in 2016.

Total fee and other revenue decreased \$359 million compared with 2016, primarily reflecting the impact of U.S. tax legislation on our investments in renewable energy investments and lower net securities gains.

Net interest expense was \$79 million in 2017 compared with net interest revenue of \$14 million in 2016. The \$93 million decrease primarily reflects the impact of interest rate hedging activities and leasing-related adjustments, partially offset by higher interest rates.

Noninterest expense, excluding amortization of intangible assets and M&I and restructuring charges (recoveries), decreased \$45 million compared with 2016. The decrease was primarily driven by lower staff and other expenses.

2016 compared with 2015

Income before taxes was \$11 million in 2016 compared with a loss of \$146 million in 2015. Total revenue decreased \$41 million primarily driven by lower other income driven by the impact of increased investments in renewable energy, and results of the leasing portfolio inclusive of changes to internal transfer pricing in 2016, partially offset by the positive impact of foreign currency hedging activity. The provision for credit losses was a credit of \$25 million in 2016 reflecting the receipt of trust assets from the bankruptcy proceedings of Sentinel in excess of the carrying value. The provision for credit losses was \$133 million in 2015 reflecting the

impairment charge related to Sentinel. Noninterest expense, excluding amortization of intangible assets and M&I and restructuring charges (recoveries), decreased \$44 million primarily reflecting lower equipment expense and professional, legal and other purchased services, partially offset by higher software expense.

International operations

Our primary international activities consist of asset servicing and global payment services in our Investment Services business and asset management in our Investment Management business.

Our clients include central banks and sovereigns, financial institutions, asset managers, insurance companies, corporations, local authorities and high net worth individuals and family offices. Through our global network of offices, we have developed a deep understanding of local requirements and cultural needs, and we pride ourselves on providing dedicated service through our multilingual sales, marketing and client service teams.

At Dec. 31, 2017, we had approximately 8,800 employees in Europe, the Middle East and Africa (“EMEA”), approximately 15,300 employees in the Asia-Pacific region (“APAC”) and approximately 700 employees in other global locations, primarily Brazil.

We are the seventh largest global asset manager. At Dec. 31, 2017, our international operations managed 51% of BNY Mellon’s AUM, compared with 49% at Dec. 31, 2016. The increase in international AUM primarily resulted from the favorable impact of a weaker U.S. dollar (principally versus the British pound), net inflows and higher market values.

In Europe, we maintain a presence in Undertakings for Collective Investment in Transferable Securities Directives (“UCITS”). In Ireland, BNY Mellon provides fund administration services across domiciled and non-domiciled funds. We offer a full range of tailored solutions for investment companies, financial institutions and institutional investors in Germany.

We are a provider of non-U.S. government securities clearance, settling securities transactions in approximately 100 markets.

We have extensive experience providing trade and cash services to financial institutions and central banks outside of the U.S. In addition, we offer a broad range of servicing and fiduciary products to financial institutions, corporations and central banks depending on the state of market development. In emerging markets, we lead with global payments and issuer services, introducing other products as the markets mature. For more established markets, our focus is on global investment services.

We are also a full-service global provider of foreign exchange services, actively trading in over 100 of the world's currencies. We serve clients from trading desks located in Europe, Asia and North America.

Our financial results, as well as our levels of AUM and AUC/A, are impacted by translation from foreign currencies to the U.S. dollar. We are primarily impacted by activities denominated in the British pound and the euro. If the U.S. dollar depreciates against these currencies, the translation impact is a higher level of fee revenue, net interest revenue, noninterest expense and AUM and AUC/A. Conversely, if the U.S. dollar appreciates, the translated levels of fee revenue, net interest revenue, noninterest expense and AUM and AUC/A will be lower.

Foreign exchange rates vs. U.S. dollar	2017	2016	2015
Spot rate (at Dec. 31):			
British pound	\$ 1.3532	\$ 1.2323	\$ 1.4799
Euro	1.2009	1.0538	1.0883
Yearly average rate:			
British pound	\$ 1.2885	\$ 1.3548	\$ 1.5282
Euro	1.1390	1.1065	1.1100

International clients accounted for 36% of revenues in 2017, compared with 34% in 2016 and 36% in 2015. Net income from international operations was \$1.8 billion in 2017, compared with \$1.6 billion in 2016 and \$1.7 billion in 2015.

In 2017, revenues from EMEA were \$4.0 billion, compared with \$3.7 billion in 2016 and \$3.9 billion in 2015. Revenues from EMEA increased 6% in 2017 compared with 2016, primarily reflecting higher revenue in the Investment Services business driven by higher asset servicing fees, primarily reflecting higher equity market values, net new business, including growth in collateral management, partially offset by the downsizing of the UK transfer agency

business. Revenues from EMEA also reflect higher revenue in the Investment Management business, driven by higher market values, money market fees and performance fees, partially offset by the unfavorable impact of a stronger U.S. dollar (principally versus the British pound). Our Investment Services business generated 67% and our Investment Management business generated 33% of EMEA revenues. Net income from EMEA was \$1.2 billion in 2017, compared with \$1.0 billion in 2016 and \$1.2 billion in 2015.

Revenues from APAC were \$997 million in 2017, compared with \$922 million in 2016 and \$904 million in 2015. Revenues from APAC increased 8% in 2017 compared with 2016, primarily reflecting higher net interest revenue and treasury services fees in the Investment Services business. Our Investment Services businesses generated 80% and our Investment Management businesses generated 20% of APAC revenues. Net income from APAC was \$426 million in 2017, compared with \$389 million in 2016 and \$365 million in 2015.

For additional information regarding our international operations, including certain key subjective assumptions used in determining the results, see Note 23 of the Notes to Consolidated Financial Statements.

Country risk exposure

We have exposure to certain countries with higher risk profiles. Exposure described below reflects the country of operations and risk of the immediate counterparty. We continue to monitor our exposure to these and other countries as part of our risk management process. See "Risk management" for additional information on how our exposures are managed.

BNY Mellon has a limited economic interest in the performance of assets of consolidated investment management funds, and therefore they are excluded from this disclosure.

Italy and Spain

Events in recent years have resulted in increased focus on Italy and Spain. We had net exposure of \$1.8 billion to Italy and \$2.1 billion to Spain at Dec. 31, 2017. We had net exposure of \$1.2 billion to Italy and \$2.0 billion to Spain at Dec. 31, 2016. At both Dec. 31, 2017 and Dec. 31, 2016, exposure to Italy

and Spain primarily consisted of investment grade sovereign debt. Investment securities exposure totaled \$1.3 billion in Italy and \$1.6 billion in Spain at Dec. 31, 2017 and \$1.1 billion in Italy and \$1.8 billion in Spain at Dec. 31, 2016.

Brazil

Conditions in Brazil have resulted in increased focus on its economic and political stability. We have operations in Brazil providing investment services and investment management services. At Dec. 31, 2017 and Dec. 31, 2016, we had total net exposure to Brazil of \$1.4 billion and \$1.3 billion, respectively. This included \$1.3 billion at both periods in loans, which are primarily short-term trade finance loans extended to large financial institutions. At Dec. 31, 2017 and Dec. 31, 2016, we held \$136 million and \$73 million, respectively, of non-investment grade sovereign debt.

Turkey

Events in recent years have resulted in increased focus on exposure to Turkey. We mainly provide treasury and issuer services, as well as foreign exchange products primarily to the top-10 largest financial institutions in the country. As of Dec. 31, 2017 and Dec. 31, 2016, our exposure totaled \$707 million and \$713 million, respectively, consisting primarily of syndicated credit facilities and trade finance loans.

Cross-border risk

Cross-border outstandings are based on the Federal Financial Institutions Examination Council's ("FFIEC") regulatory guidelines for reporting cross-border risk. Cross-border outstandings in the table below include loans, acceptances, interest-bearing deposits with other banks, other interest-bearing investments, and other monetary assets which are denominated in U.S. dollars or other non-local currencies. Also included are local currency outstandings not hedged or funded by local borrowings. Under the FFIEC guidelines, cross-border outstandings are reported based on the domicile of the counterparty, issuer of collateral or guarantor.

Foreign assets are subject to the general risks attendant on the conduct of business in each foreign country, including economic uncertainties and each foreign government's regulations. In addition, our foreign assets may be affected by changes in demand or pricing resulting from fluctuations in currency exchange rates or other factors.

The table below shows our cross-border outstandings at Dec. 31 of each of the last three years where cross-border exposure exceeds 1.00% of total assets (denoted with "**") or exceeds 0.75% but less than or equal to 1.00% of total assets (denoted with "**").

Cross-border outstandings <i>(in millions)</i>	Banks and other financial institutions <i>(a)</i>	Public sector	Commercial, industrial and other	Total cross-border outstandings <i>(b)</i>
2017:				
Germany**	\$ 1,530	\$ 1,344	\$ 600	\$ 3,474
Canada**	2,256	1	1,170	3,427
France**	295	2,519	130	2,944
2016:				
France*	\$ 1,662	\$ 2,559	\$ 109	\$ 4,330
Germany*	2,398	1,408	357	4,163
Canada*	2,199	1	1,211	3,411
United Kingdom**	1,325	1,584	405	3,314
2015:				
United Kingdom*	\$ 1,732	\$ 569	\$ 2,265	\$ 4,566
France*	968	2,855	120	3,943
Germany**	1,882	1,666	363	3,911

(a) Primarily short-term interest-bearing deposits with banks. Also includes global trade finance loans.

(b) Excludes assets of consolidated investment management funds.

Emerging markets exposure

We determine our emerging markets exposures using the MSCI Emerging Markets (EM) IMI Index. Our emerging markets exposures totaled \$11 billion at both Dec. 31, 2017 and Dec. 31, 2016, as higher interest-bearing deposits with banks in China were offset by lower trade finance loans and interest-bearing deposits with banks in various countries.

Critical accounting estimates

Our significant accounting policies are described in Note 1 of the Notes to Consolidated Financial Statements under “Summary of significant accounting and reporting policies.” Our critical accounting estimates are those related to the allowance for loan losses and allowance for lending-related commitments, fair value of financial instruments and derivatives, other-than-temporary impairment, goodwill and other intangibles, and pension accounting. Further information on policies related to the allowance for loan losses and allowance for lending-related commitments can be found under “Summary of significant accounting and reporting policies” in Note 1 of the Notes to Consolidated Financial Statements. Additionally, further information can be found in the Notes to Consolidated Financial Statements related to the following: the valuation of derivatives and securities where quoted market prices are not available can be found under “Fair value measurement” in Note 18; information on other-than-temporary impairment can be found in “Securities” in Note 4; policies related to goodwill and intangible assets can be found in “Goodwill and intangible assets” in Note 6; and information on pensions can be found in “Employee benefit plans” in Note 16.

Allowance for loan losses and allowance for lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represent management’s estimate of losses inherent in our credit portfolio. This evaluation process is subject to numerous estimates and judgments.

We utilize a quantitative methodology and qualitative framework for determining the allowance for loan losses and the allowance for lending-related commitments. Within this qualitative framework, management applies judgment when assessing

internal risk factors and environmental factors to compute an additional allowance for each component of the loan portfolio.

The three elements of the allowance for loan losses and the allowance for lending-related commitments include the qualitative allowance framework. The three elements are:

- an allowance for impaired credits of \$1 million or greater;
- an allowance for higher risk-rated credits and pass-rated credits; and
- an allowance for residential mortgage loans.

Our lending is primarily to institutional customers. As a result, our loans are generally larger than \$1 million. Therefore, the first element, impaired credits, is based on individual analysis of all impaired loans of \$1 million or greater. The allowance is measured by the difference between the recorded value of impaired loans and their impaired value. Impaired value is either the present value of the expected future cash flows from the borrower, the market value of the loan, or the fair value of the collateral, if the loan is collateral dependent.

The second element, higher risk-rated credits and pass-rated credits, is based on our incurred loss model. Individual credit analyses are performed on such loans before being assigned a credit rating. All borrowers are collectively evaluated based on their credit rating. The loss inherent in each loan incorporates the borrower’s credit rating, facility rating and maturity. The loss given default, derived from the facility rating, incorporates a recovery expectation and an estimate of the use of the facility at default (usage given default). The borrower’s probability of default is derived from the associated credit rating. Borrower ratings are reviewed at least annually and are periodically mapped to third-party databases, including rating agency and default and recovery databases, for ongoing consistency and validity. Higher risk-rated credits are reviewed quarterly.

The third element, the allowance for residential mortgage loans, is determined by segregating six mortgage pools into delinquency periods, ranging from current through foreclosure. Each of these delinquency periods is assigned a probability of default. A specific loss given default is assigned for each mortgage pool. BNY Mellon assigns all

residential mortgage pools, except home equity lines of credit, a probability of default and loss given default based on default and loss data derived from internal historical data related to our residential mortgage portfolio. The resulting incurred loss factor (the probability of default multiplied by the loss given default) is applied against the loan balance to determine the allowance held for each pool. For home equity lines of credit, probability of default and loss given default are based on external data from third-party databases due to the small size of the portfolio and insufficient internal data.

The qualitative framework is used to determine an additional allowance for each portfolio based on the factors below:

Internal risk factors:

- Ratio of nonperforming loans to total non-margin loans;
- Ratio of criticized assets to total loans and lending-related commitments;
- Borrower concentration; and
- Significant concentrations in high-risk industries and countries.

Environmental risk factors:

- U.S. non-investment grade default rate;
- Unemployment rate; and
- Change in real gross domestic product.

The objective of the qualitative framework is to capture incurred losses that may not have been fully captured in the quantitative reserve, which is based primarily on historical data. Management determines the qualitative allowance each period based on judgment informed by consideration of internal and external risk factors and other considerations that may be deemed relevant during the period. Once determined in the aggregate, our qualitative allowance is then allocated to each of our loan classes based on the respective classes' quantitative allowance balances with the allocations adjusted, when necessary, for class specific risk factors.

For each risk factor, we calculate the minimum and maximum values, and percentiles in-between, to evaluate the distribution of our historical experience. The distribution of historical experience is compared to the risk factor's current quarter observed experience to assess the current risk inherent in the

portfolio and overall direction/trend of a risk factor relative to our historical experience.

Based on this analysis, we assign a risk level—no impact, low, moderate, high and elevated—to each risk factor for the current quarter. Management assesses the impact of each risk factor to determine an aggregate risk level. We do not quantify the impact of any particular risk factor. Management's assessment of the risk factors, as well as the trend in the quantitative allowance, supports management's judgment for the overall required qualitative allowance. A smaller qualitative allowance may be required when our quantitative allowance has reflected incurred losses associated with the aggregate risk level. A greater qualitative allowance may be required if our quantitative allowance does not yet reflect the incurred losses associated with the aggregate risk level.

To the extent actual results differ from forecasts or management's judgment, the allowance for credit losses may be greater or less than future charge-offs.

The credit rating assigned to each credit is a significant variable in determining the allowance. If each credit were rated one grade better, the allowance would have decreased by \$64 million, while if each credit were rated one grade worse, the allowance would have increased by \$104 million. Similarly, if the loss given default were one rating worse, the allowance would have increased by \$42 million, while if the loss given default were one rating better, the allowance would have decreased by \$29 million. For impaired credits, if the net carrying value of the loans was 10% higher or lower, the allowance would have decreased or increased by less than \$1 million, respectively.

Fair value of financial instruments and derivatives

The guidance included in Accounting Standards Codification ("ASC") 820, *Fair Value Measurement*, defines fair value, establishes a framework for measuring fair value, and expands disclosures about assets and liabilities measured at fair value. The standard also established a three-level hierarchy for fair value measurements based upon the transparency of inputs to the valuation of an asset or liability as of the measurement date.

Fair value - Securities

Level 1 - Securities: Securities where valuations are based on recent quoted prices for identical securities in actively traded markets.

Level 2 - Securities: For securities where quotes from recent transactions are not available for identical securities, we determine fair value primarily based on pricing sources with reasonable levels of price transparency. The pricing sources employ financial models or obtain comparisons to similar instruments to arrive at “consensus” prices.

Specifically, the pricing sources obtain recent transactions for similar types of securities (e.g., vintage or position in the securitization structure) and ascertain variables such as discount rate and speed of prepayment for the type of transaction and apply such variables to similar types of bonds. We view these as observable transactions in the current market place and classify such securities as Level 2.

In addition, we have significant investments in more actively traded agency residential mortgage-backed securities (“RMBS”) and other types of securities such as sovereign debt. The pricing sources derive the prices for these securities largely from quotes they obtain from three major inter-dealer brokers. The pricing sources receive their daily observed trade price and other information feeds from the inter-dealer brokers.

We obtain prices for our Level 1 and Level 2 securities from multiple pricing sources. We have designed controls to develop an understanding of the pricing sources’ securities pricing methodology and have implemented specific internal controls over the valuation of securities.

As appropriate, we review the quality control procedures and pricing methodologies used by the pricing sources, including the process for obtaining prices provided by the pricing sources, their valuation methodology and controls for each class of security.

Prices received from pricing sources are subject to validation checks that help determine the completeness and accuracy of the prices. These validation checks are reviewed by management and, based on the results, may be subject to additional review and investigation. We also review securities

with no price changes (stale prices) and securities with zero values.

We have a surveillance process in place to monitor the reasonableness of prices provided by the pricing sources. We utilize a hierarchy that compares security prices obtained from multiple pricing sources against established thresholds. Discrepancies that fall outside of these thresholds are challenged with the pricing services and adjusted if necessary.

If further research is required, we review and validate these prices with the pricing sources. We also validate prices from pricing sources by comparing prices received to actual observed prices from actions such as purchases and sales, when possible.

At Dec. 31, 2017, approximately 99% of our securities were valued by pricing sources with reasonable levels of price transparency.

Level 3 - Securities: Where we have used our own cash flow models, which included a significant input into the model that was deemed unobservable, to estimate the value of securities, we classify them in Level 3. At both Dec. 31, 2017 and Dec. 31, 2016, we have no securities included in Level 3 of the fair value hierarchy.

See Note 18 of the Notes to Consolidated Financial Statements for details of our securities by ASC 820, *Fair Value Measurement*, hierarchy level.

Fair value - Derivative financial instruments

Level 1 - Derivative financial instruments: Includes derivative financial instruments that are actively traded on exchanges, principally listed equity options.

Level 2 - Derivative financial instruments: Includes the vast majority of our over-the-counter (“OTC”) derivative financial instruments. Derivatives classified as Level 2 are valued utilizing discounted cash flow analysis and financial models for which the valuation inputs are observable or can be corroborated, directly or indirectly, for substantially the full term of the instrument. Valuation inputs include interest rate yield curves, foreign exchange rates, equity prices, credit curves, option volatilities and other factors.

Where appropriate, valuation adjustments are made to account for various factors such as creditworthiness

of the counterparty, credit worthiness of the Company and model and liquidity risks. Level 2 over-the-counter derivatives generally include interest rate swaps and options, foreign exchange forwards, foreign exchange swaps and options, forward rate agreements, equity swaps and options, and credit default swaps.

Level 3 - Derivative financial instruments: Level 3 derivatives include derivatives for which valuations are based on inputs that are unobservable and significant to the overall fair value measurement, and may include certain long-dated or highly structured contracts. At both Dec. 31, 2017 and Dec. 31, 2016, we have no derivatives included in Level 3 of the fair value hierarchy.

For details of our derivative financial instruments by level of the valuation hierarchy, see Note 18 of the Notes to Consolidated Financial Statements.

Fair value option

ASC 825, *Financial Instruments*, provides the option to elect fair value as an alternative measurement basis for selected financial assets, financial liabilities, unrecognized firm commitments and written loan commitments which are not subject to fair value under other accounting standards. Under ASC 825, *Financial Instruments*, fair value is used for both the initial and subsequent measurement of the designated assets, liabilities and commitments, with the changes in fair value recognized in income. See Note 19 of the Notes to Consolidated Financial Statements for additional disclosure regarding the fair value option.

Fair value - Judgments

In times of illiquid markets and financial stress, actual prices and valuations may significantly diverge from results predicted by models. In addition, other factors can affect our estimate of fair value, including market dislocations, incorrect model assumptions, and unexpected correlations. These valuation methods could expose us to materially different results should the models used or underlying assumptions be inaccurate. See Note 1 to the Notes to Consolidated Financial Statements.

Other-than-temporary impairment

The guidance included in ASC 320, *Investments - Debt and Equity Securities*, defines the other-than-

temporary impairment (“OTTI”) model for investments in debt securities. Under this guidance, a debt security is considered impaired if its fair value is less than its amortized cost basis. An OTTI is triggered if (1) the intent is to sell the security; (2) the security will more likely than not have to be sold before the impairment is recovered, or (3) the amortized cost basis is not expected to be recovered. When an entity does not intend to sell the security before recovery of its cost basis, it will recognize the credit component of an OTTI of a debt security in earnings and the remaining portion in accumulated other comprehensive income.

The determination of whether a credit loss exists is based on best estimates of the present value of cash flows to be collected from the debt security. Generally, cash flows are discounted at the effective interest rate implicit in the debt security at the time of acquisition. For debt securities that are beneficial interests in securitized financial assets and are not high credit quality, ASC 325, *Investments - Other*, provides that cash flows be discounted at the current yield used to accrete the beneficial interest.

For each security in the investment securities portfolio, an extensive, quarterly review is conducted to determine if an OTTI has occurred. For example, to determine if an unrealized loss on non-agency RMBS is other-than-temporary, we project total estimated defaults of the underlying assets (mortgages) and multiply that calculated amount by an estimate of realizable value upon sale of these assets in the marketplace (severity) in order to determine the projected collateral loss. We also evaluate the current credit enhancement underlying the bond to determine the impact on cash flows. If we determine that a given non-agency RMBS will be subject to a write-down or loss, we record the expected credit loss as a charge to earnings.

In recent years, improving home prices helped to stabilize the credit performance of non-agency RMBS transactions. This in turn enabled us to maintain generally stable assumptions for these transactions with regard to estimated defaults and the amount we expect to receive to cover the value of the loans underlying the securities. See Note 4 of the Notes to Consolidated Financial Statements for projected weighted-average default rates and loss severities at Dec. 31, 2017 and 2016 for the 2007, 2006 and late-2005 non-agency RMBS and the securities previously held in the Grantor Trust we established in

connection with the restructuring of our investment securities portfolio in 2009. If actual delinquencies, default rates and loss severity assumptions worsen, we would expect additional impairment losses to be recorded in future periods.

At Dec. 31, 2017, if we were to increase each of our projected loss severity and default rates by 100 basis points on each of the positions in our Alt-A, subprime and prime RMBS portfolios, including the securities previously held by the Grantor Trust, credit-related impairment charges on these securities would have increased by less than \$1 million (pre-tax). If we were to decrease each of our projected loss severity and default rates by 100 basis points on each of the positions, credit-related impairment charges on these securities would have decreased by less than \$1 million (pre-tax).

Goodwill and other intangibles

We initially record all assets and liabilities acquired in purchase acquisitions, including goodwill, indefinite-lived intangibles and other intangibles, in accordance with ASC 805, *Business Combinations*. Goodwill, indefinite-lived intangibles and other intangibles are subsequently accounted for in accordance with ASC 350, *Intangibles - Goodwill and Other*. The initial measurement of goodwill and intangibles requires judgment concerning estimates of the fair value of the acquired assets and liabilities. Goodwill (\$17.6 billion at Dec. 31, 2017) and indefinite-lived intangible assets (\$2.6 billion at Dec. 31, 2017) are not amortized but subject to tests for impairment annually or more often if events or circumstances indicate it is more likely than not they may be impaired. Other intangible assets are amortized over their estimated useful lives and are subject to impairment if events or circumstances indicate a possible inability to realize the carrying value.

BNY Mellon's three business segments include eight reporting units for which annual goodwill impairment testing is performed in accordance with ASC 350, *Intangibles - Goodwill and Other*. The Investment Management segment is comprised of two reporting units; the Investment Services segment is comprised of five reporting units and one reporting unit is included in the Other segment.

The goodwill impairment test compares the estimated fair value of the reporting unit with its carrying

amount, including goodwill. If the estimated fair value of the reporting unit exceeds its carrying amount, goodwill of the reporting unit is considered not impaired. However, if the carrying amount of the reporting unit were to exceed its estimated fair value, an impairment loss would be recorded. A substantial goodwill impairment charge would not have a significant impact on our financial condition or our regulatory capital ratios, but could have an adverse impact on our results of operations. In addition, due to regulatory restrictions, the Company's subsidiary banks could be restricted from distributing available cash to the Parent, resulting in the Parent needing to issue additional long-term debt.

In the second quarter of 2017, we performed our annual goodwill test on all eight reporting units using an income approach, and in certain cases a combination of an income and market approach (which produced reasonably consistent results), to estimate the fair values of each reporting unit. Estimated cash flows used in the income approach were based on management's projections as of April 1, 2017. The discount rate applied to these cash flows ranged from 9.5% to 10.5% and incorporated a 6.0% market equity risk premium. Estimated cash flows extend many years into the future, and, by their nature, are difficult to estimate over such an extended time frame.

As a result of the annual goodwill impairment test of the eight reporting units, no goodwill impairment was recognized. The fair value of the Asset Management reporting unit, which is one of the two reporting units in the Investment Management segment, exceeded its carrying value by 16%. The Asset Management reporting unit had \$7.3 billion of allocated goodwill. For the Asset Management reporting unit, in the future, changes in the assumptions, such as changes in the level of AUM and operating margin, could produce a non-cash goodwill impairment.

Key judgments in accounting for intangibles include useful life and classification between goodwill and indefinite-lived intangibles or other intangibles requiring amortization.

Indefinite-lived intangible assets are evaluated for impairment at least annually by comparing their fair values, estimated using discounted cash flow analyses, to their carrying values. Other amortizing intangible assets (\$0.8 billion at Dec. 31, 2017) are evaluated for impairment if events and circumstances

indicate a possible impairment. Such evaluation of other intangible assets would be initially based on undiscounted cash flow projections.

See Notes 1 and 6 of the Notes to Consolidated Financial Statements for additional information regarding goodwill, intangible assets and the annual and interim impairment testing.

Pension accounting

BNY Mellon has defined benefit pension plans covering approximately 13,300 U.S. employees and approximately 15,500 non-U.S. employees.

BNY Mellon has one qualified and several non-qualified defined benefit pension plans in the U.S. and several pension plans overseas. As of Dec. 31, 2017, the U.S. plans accounted for 77% of the projected benefit obligation. The pension credit for BNY Mellon plans was \$27 million in 2017 compared with a pension credit of \$44 million in 2016 and a pension credit of \$10 million in 2015.

Effective June 30, 2015, the benefit accruals under the U.S. qualified and nonqualified defined benefit plans were frozen. This change resulted in no additional benefits being earned by participants in those plans based on service or pay after June 30, 2015. These plans were previously closed to new participants effective Dec. 31, 2010, at which time a non-elective contribution was added to the Company's defined contribution plan for employees not eligible to join the pension plan. Employees previously participating in the pension plan received this non-elective contribution starting July 1, 2015.

A total net pension credit of \$72 million is expected to be recorded by BNY Mellon in 2018, assuming currency exchange rates at Dec. 31, 2017. The expected increase in the net pension credit in 2018 compared with 2017 is primarily driven by a decrease in pension costs due to stronger than expected asset performance in the U.S. and certain foreign countries during 2017, partially offset by an increase in costs due to lower discount rates.

A number of key assumptions and measurement date values determine pension expense. The key elements include the long-term rate of return on plan assets, the discount rate, the market-related value of plan assets and the price used to value stock in the Employee

Stock Ownership Plan ("ESOP"). Since 2015, these key elements have varied as follows:

<i>(dollars in millions, except per share amounts)</i>	2018	2017	2016	2015
Domestic plans:				
Long-term rate of return on plan assets	6.625%	6.625%	7.00%	7.25%
Discount rate (a)	3.97%	4.35%	4.48%	4.13%
Market-related value of plan assets (b)	\$ 5,238	\$ 5,026	\$ 4,830	\$ 4,696
ESOP stock price (b)	\$ 52.80	\$ 44.19	\$ 41.66	\$ 39.18
Net U.S. pension credit (expense)	N/A \$ 76	\$ 77	\$ 77	\$ 52
All other net pension credit (expense)	N/A (49)	(33)	(33)	(42)
Total net pension credit (expense)	N/A \$ 27	\$ 44	\$ 44	\$ 10

(a) As a result of the amendment to the U.S. pension plans, liabilities for 2015 were re-measured as of Jan. 29, 2015 at a discount rate of 3.73%.

(b) Market-related value of plan assets and ESOP stock price are for the beginning of the plan year. See "Summary of significant accounting and reporting policies" in Note 1 of the Notes to Consolidated Financial Statements. The market-related value of plan assets was \$4,713 million as of the Jan. 29, 2015 re-measurement.

The discount rate for U.S. pension plans was determined after reviewing equivalent rates obtained by discounting the pension plans' expected cash flows using various high-quality, long-term corporate bond yield curves. We also reviewed the results of several models that matched bonds to our pension cash flows. After reviewing the various indices and models, we selected a discount rate of 3.97% as of Dec. 31, 2017.

The discount rates for foreign pension plans are based on high-quality corporate bond rates in countries that have an active corporate bond market. In those countries with no active corporate bond market, discount rates are based on local government bond rates plus a credit spread.

Our expected long-term rate of return on plan assets is based on anticipated returns for each applicable asset class. Anticipated returns are weighted for the expected allocation for each asset class and are based on forecasts for prospective returns in the equity and fixed-income markets, which should track the long-term historical returns for these markets. We also consider the growth outlook for U.S. and global economies, as well as current and prospective interest rates.

The market-related value of plan assets also influences the level of pension expense. Differences between expected and actual returns are recognized over five years to compute an actuarially derived market-related value of plan assets.

Unrecognized actuarial gains and losses are amortized over the future service period of active employees if they exceed a threshold amount. As of Dec. 31, 2017, BNY Mellon had \$1.3 billion of unrecognized losses which are being amortized. As a result of the amendment to the U.S. pension plans described above, future unrecognized actuarial gains and losses for the U.S. plans that exceed a threshold amount will be amortized over the average future life expectancy of plan participants with a maximum of 15 years.

The annual impacts of hypothetical changes in the key assumptions on pension costs are shown in the table below.

Pension expense				
<i>(dollar amounts in millions, except per share amounts)</i>	Increase in pension expense		(Decrease) in pension expense	
Long-term rate of return on plan assets	(100) bps	(50) bps	50 bps	100 bps
Change in pension expense	\$ 64	\$ 32	\$ (32)	\$ (64)
Discount rate	(50) bps	(25) bps	25 bps	50 bps
Change in pension expense	\$ 29	\$ 14	\$ (13)	\$ (25)
Market-related value of plan assets	(20) %	(10) %	10 %	20 %
Change in pension expense	\$ 187	\$ 93	\$ (93)	\$ (169)
ESOP share price	\$ (10)	\$ (5)	\$ 5	\$ 10
Change in pension expense	\$ 5	\$ 3	\$ (3)	\$ (5)

In addition to its pension plans, BNY Mellon has an ESOP. Benefits payable under The Bank of New York Mellon Corporation Pension Plan are offset by the equivalent value of benefits earned under the ESOP for employees who participated in the legacy Retirement Plan of The Bank of New York Company, Inc.

Consolidated balance sheet review

One of our key risk management objectives is to maintain a balance sheet that remains strong throughout market cycles to meet the expectations of our major stakeholders, including our shareholders, clients, creditors and regulators.

We also seek to verify that the overall liquidity risk, including intra-day liquidity risk, that we undertake stays within our risk appetite. The objective of our balance sheet management strategy is to maintain a balance sheet that is characterized by strong liquidity and asset quality, ready access to external funding sources at competitive rates and a strong capital structure that supports our risk-taking activities and is adequate to absorb potential losses. In managing the balance sheet, appropriate consideration is given to balancing the competing needs of maintaining sufficient levels of liquidity and complying with applicable regulations and supervisory expectations while optimizing profitability.

In 2017, we continued to maintain sufficient liquidity and comply with applicable regulations. Our overall liquidity position remained strong and is managed in accordance with the nature of our balance sheet and business model. Our LCR averaged 118% in the fourth quarter as we met the 100% fully phased-in regulatory requirement. Additionally, we increased the estimated fully phased-in SLR (Non-GAAP) to 5.9% at Dec. 31, 2017 from 5.6% at Dec. 31, 2016. This is above the regulatory minimum of 5.0%, which became effective Jan. 1, 2018.

At Dec. 31, 2017, total assets were \$372 billion compared with \$333 billion at Dec. 31, 2016. The increase in total assets was primarily driven by higher interest-bearing deposits with the Federal Reserve and other central banks, partially offset by lower loans. Deposits totaled \$244 billion at Dec. 31, 2017 and \$221 billion at Dec. 31, 2016, and were driven by higher interest-bearing deposits in non-U.S. offices. At Dec. 31, 2017 and Dec. 31, 2016, total interest-bearing deposits were 51% of total interest-earning assets.

At Dec. 31, 2017, we had \$40 billion of liquid funds (which include interest-bearing deposits with banks and federal funds sold and securities purchased under resale agreements) and \$97 billion of cash (including \$92 billion of overnight deposits with the Federal Reserve and other central banks) for a total of \$137 billion of available funds. This compares with available funds of \$104 billion at Dec. 31, 2016. Total available funds as a percentage of total assets were 37% at Dec. 31, 2017 compared with 31% at Dec. 31, 2016. For additional information on our liquid funds and available funds, see “Liquidity and dividends.”

Results of Operations (continued)

Investment securities were \$120 billion, or 32% of total assets, at Dec. 31, 2017, compared with \$115 billion, or 34% of total assets, at Dec. 31, 2016. The higher level of securities primarily reflects additional investments in commercial MBS and agency RMBS, partially offset by a decrease in consumer asset-backed securities (“ABS”). For additional information on our investment securities portfolio, see “Investment securities” and Note 4 of the Notes to Consolidated Financial Statements.

Loans were \$62 billion, or 17% of total assets, at Dec. 31, 2017, compared with \$64 billion, or 19% of total assets, at Dec. 31, 2016. The decrease in loans was primarily driven by lower margin loans and loans to financial institutions. For additional information on our loan portfolio, see “Loans” and Note 5 of the Notes to Consolidated Financial Statements.

Long-term debt totaled \$28 billion at Dec. 31, 2017 and \$24 billion at Dec. 31, 2016. The increase reflects issuances of \$5 billion, partially offset by the maturity of \$750 million and the redemption of trust

preferred securities. For additional information on long-term debt, see “Liquidity and dividends” and Note 11 of the Notes to Consolidated Financial Statements.

The Bank of New York Mellon Corporation total shareholders’ equity increased to \$41 billion from \$39 billion at Dec. 31, 2016. For additional information on our capital, see “Capital” and Note 13 of the Notes to Consolidated Financial Statements.

Investment securities

In the discussion of our investment securities portfolio, we have included certain credit ratings information because the information can indicate the degree of credit risk to which we are exposed. Significant changes in ratings classifications for our investment securities portfolio could indicate increased credit risk for us and could be accompanied by a reduction in the fair value of our investment securities portfolio.

The following table shows the distribution of our total investment securities portfolio.

Investment securities portfolio (dollars in millions)	Dec. 31, 2016	2017 change in unrealized gain (loss)	Dec. 31, 2017		Fair value as a % of amortized cost (a)	Unrealized gain (loss)	Ratings (b)				
	Fair value		Amortized cost	Fair value			AAA/AA-	A+/A-	BBB+/BBB-	BB+ and lower	Not rated
Agency RMBS	\$ 47,715	\$ (29)	\$ 50,210	\$ 49,746	99%	\$ (464)	100%	—%	—%	—%	—%
U.S. Treasury	25,244	143	24,951	24,848	100	(103)	100	—	—	—	—
Sovereign debt/sovereign guaranteed (c)	14,373	(84)	13,998	14,128	101	130	72	6	21	1	—
Non-agency RMBS (d)	1,357	3	811	1,091	85	280	—	1	3	85	11
Non-agency RMBS	718	18	511	549	98	38	7	4	21	67	1
European floating rate notes (e)	706	7	275	271	97	(4)	49	51	—	—	—
Commercial MBS	8,037	38	11,425	11,394	100	(31)	99	1	—	—	—
State and political subdivisions	3,396	22	2,966	2,973	100	7	80	17	—	—	3
Foreign covered bonds (f)	2,216	(5)	2,604	2,615	100	11	100	—	—	—	—
Corporate bonds	1,396	1	1,249	1,255	101	6	17	69	14	—	—
CLOs	2,598	6	2,898	2,909	100	11	98	—	—	1	1
U.S. government agencies	1,964	24	2,570	2,603	101	33	100	—	—	—	—
Consumer ABS	1,727	5	1,040	1,043	100	3	93	—	5	2	—
Other (g)	2,833	(13)	4,485	4,483	100	(2)	82	16	—	—	2
Total investment securities	\$ 114,280 (h)	\$ 136	\$ 119,993	\$ 119,908 (h)	99%	\$ (85) (h)(i)	93%	3%	3%	1%	—%

(a) Amortized cost before impairments.

(b) Represents ratings by S&P or the equivalent.

(c) Primarily consists of exposure to UK, France, Germany, Spain, Italy and the Netherlands.

(d) These RMBS were included in the former Grantor Trust and their amortized cost was written down to fair value in 2009. We believe these RMBS would receive higher credit ratings if these ratings incorporated, as additional credit enhancements, the difference between the written-down amortized cost and the current face amount of each of these securities.

(e) Includes RMBS and commercial MBS. Primarily consists of exposure to UK and the Netherlands.

(f) Primarily consists of exposure to Canada, Australia, the Netherlands and Norway.

(g) Includes commercial paper with a fair value of \$401 million and \$700 million and money market funds with a fair value of \$842 million and \$963 million at Dec. 31, 2016 and Dec. 31, 2017, respectively.

(h) Includes net unrealized losses on derivatives hedging securities available-for-sale of \$211 million at Dec. 31, 2016 and \$147 million at Dec. 31, 2017.

(i) Unrealized gains of \$230 million at Dec. 31, 2017 related to available-for-sale securities, net of hedges.

The fair value of our investment securities portfolio was \$119.9 billion at Dec. 31, 2017, compared with \$114.3 billion at Dec. 31, 2016. The higher level of securities primarily reflects additional investments in commercial MBS and agency RMBS, partially offset by a decrease in consumer ABS.

At Dec. 31, 2017, the total investment securities portfolio had a net unrealized loss of \$85 million, compared with a net unrealized loss of \$221 million at Dec. 31, 2016, including the impact of related hedges. The decrease in net unrealized pre-tax loss was primarily driven by a decline in long-term interest rates.

The following table presents the amortizable purchase premium (net of discount) related to the investment securities portfolio and accretible discount related to the 2009 restructuring of the investment securities portfolio.

Net premium amortization and discount accretion of investment securities (a) <i>(dollars in millions)</i>	2017	2016	2015
Amortizable purchase premium (net of discount) relating to investment securities:			
Balance at period end	\$ 1,987	\$ 2,188	\$ 2,319
Estimated average life remaining at period end <i>(in years)</i>	5.0	4.9	4.7
Amortization	\$ 547	\$ 641	\$ 693
Accretible discount related to the prior restructuring of the investment securities portfolio:			
Balance at period end	\$ 274	\$ 315	\$ 355
Estimated average life remaining at period end <i>(in years)</i>	6.3	6.2	6.1
Accretion	\$ 100	\$ 102	\$ 126

(a) Amortization of purchase premium decreases net interest revenue while accretion of discount increases net interest revenue. Both were recorded on a level yield basis.

The following table presents pre-tax net securities gains (losses) by type.

Net securities gains (losses) <i>(in millions)</i>	2017	2016	2015
Non-agency RMBS	\$ 4	\$ 8	\$ 7
Foreign covered bonds	—	10	2
Agency RMBS	(12)	22	10
U.S. Treasury	(16)	4	45
Other	27	31	19
Total net securities gains	\$ 3	\$ 75	\$ 83

The unrealized gain, net of tax, on our available-for-sale investment securities portfolio included in accumulated other comprehensive income (“OCI”) was \$184 million at Dec. 31, 2017, compared with \$45 million at Dec. 31, 2016.

At Dec. 31, 2017, 93% of the securities in our portfolio were rated AAA/AA-, unchanged compared with Dec. 31, 2016.

We routinely test our investment securities for OTTI. See “Critical accounting estimates” for additional information regarding OTTI.

The following table shows the fair value of the European floating rate notes by geographical location at Dec. 31, 2017. The net unrealized loss on these securities was \$4 million at Dec. 31, 2017, compared with \$11 million at Dec. 31, 2016.

European floating rate notes at Dec. 31, 2017 (a)			
<i>(in millions)</i>	RMBS	Other	Total fair value
United Kingdom	\$ 97	\$ 56	\$ 153
Netherlands	118	—	118
Total fair value	\$ 215	\$ 56	\$ 271

(a) Forty-nine percent of these securities are in the AAA to AA-ratings category.

See Note 18 of the Notes to Consolidated Financial Statements for details of securities by level in the fair value hierarchy.

Equity investments

We have several equity investments recorded in other assets. These include equity method investments, including renewable energy, and investments in qualified affordable housing, Federal Reserve Bank stock, seed capital, private equity and other investments. The following table presents the carrying values at Dec. 31, 2017 and 2016.

Equity investments (in millions)	Dec. 31,	
	2017	2016
Renewable energy investments	\$ 1,368	\$ 1,282
Equity in a joint venture and other investments:		
CIBC Mellon	580	509
Siguler Guff	246	256
ConvergEx	—	76
Other equity investments	257	222
Total equity in a joint venture and other investments	\$ 1,083	\$ 1,063
Qualified affordable housing project investments	1,014	914
Federal Reserve Bank stock	477	466
Seed capital	288	395
Federal Home Loan Bank stock	82	—
Private equity investments (a)	55	43
Total equity investments	\$ 4,367	\$ 4,163

(a) Represents investments in small business investment companies ("SBICs"), which are compliant with the Volcker Rule.

Loans

Total exposure – consolidated (in billions)	Dec. 31, 2017			Dec. 31, 2016		
	Loans	Unfunded commitments	Total exposure	Loans	Unfunded commitments	Total exposure
Non-margin loans:						
Financial institutions	\$ 13.1	\$ 32.5	\$ 45.6	\$ 14.7	\$ 33.7	\$ 48.4
Commercial	2.9	18.0	20.9	2.6	17.5	20.1
Subtotal institutional	16.0	50.5	66.5	17.3	51.2	68.5
Wealth management loans and mortgages	16.5	1.1	17.6	15.6	1.3	16.9
Commercial real estate	4.9	3.5	8.4	4.7	3.2	7.9
Lease financings	1.3	—	1.3	1.7	—	1.7
Other residential mortgages	0.7	—	0.7	0.9	—	0.9
Overdrafts	5.1	—	5.1	5.5	—	5.5
Other	1.2	—	1.2	1.2	—	1.2
Subtotal non-margin loans	45.7	55.1	100.8	46.9	55.7	102.6
Margin loans	15.8	—	15.8	17.6	0.1	17.7
Total	\$ 61.5	\$ 55.1	\$ 116.6	\$ 64.5	\$ 55.8	\$ 120.3

At Dec. 31, 2017, total exposures of \$116.6 billion decreased 3% compared with Dec. 31, 2016, primarily reflecting lower exposure to financial institutions, margin loans and overdrafts, partially offset by higher commercial loans and wealth management loans and mortgages.

Renewable energy investments

We invest in renewable energy projects to receive an expected after-tax return, which consists of allocated renewable energy tax credits, tax deductions and cash distributions based on the operations of the project. The pre-tax losses on these investments are recorded in investment and other income on the consolidated income statement. The corresponding tax benefits and credits are recorded to the provision for income taxes on the income statement.

The impact of U.S. tax legislation on renewable energy investments resulted in a pre-tax accounting reduction of \$279 million. This reduction was recorded in investment and other income, which was offset by the tax benefit from remeasurement of the related deferred tax liability. The net impact of these items was de minimis to net income.

For additional information on the fair value of certain seed capital investments and our private equity investments, see Note 7 of the Notes to Consolidated Financial Statements.

Financial institutions

The financial institutions portfolio is shown below.

Financial institutions portfolio exposure (dollar amounts in billions)	Dec. 31, 2017						Dec. 31, 2016		
	Loans	Unfunded commitments	Total exposure	% Inv. grade	% due <1 yr.	Loans	Unfunded commitments	Total exposure	
Securities industry	\$ 3.6	\$ 19.2	\$ 22.8	98%	99%	\$ 3.8	\$ 19.2	\$ 23.0	
Banks	7.0	1.2	8.2	68	96	7.9	2.0	9.9	
Asset managers	1.4	6.4	7.8	99	87	1.5	6.2	7.7	
Insurance	0.1	3.5	3.6	99	15	0.1	3.8	3.9	
Government	0.1	0.9	1.0	91	36	0.1	0.9	1.0	
Other	0.9	1.3	2.2	98	66	1.3	1.6	2.9	
Total	\$ 13.1	\$ 32.5	\$ 45.6	93%	87%	\$ 14.7	\$ 33.7	\$ 48.4	

The financial institutions portfolio exposure was \$45.6 billion at Dec. 31, 2017, compared with \$48.4 billion at Dec. 31, 2016. The decrease primarily reflects lower exposure in the banks, other and insurance portfolios.

Financial institution exposures are high-quality, with 93% of the exposures meeting the investment grade equivalent criteria of our internal credit rating classification at Dec. 31, 2017. Each customer is assigned an internal credit rating, which is mapped to an equivalent external rating agency grade based upon a number of dimensions, which are continually evaluated and may change over time. The exposure to financial institutions is generally short-term. Of these exposures, 87% expire within one year and 21% expire within 90 days. In addition, 79% of the financial institutions exposure is secured. For example, securities industry clients and asset managers often borrow against marketable securities held in custody.

For ratings of non-U.S. counterparties, our internal credit rating is generally capped at a rating equivalent to the sovereign rating of the country where the counterparty resides, regardless of the internal credit rating assigned to the counterparty or the underlying collateral.

At Dec. 31, 2017, the secured intraday credit provided to dealers in connection with their tri-party repo activity totaled \$18.7 billion and was primarily included in the securities industry portfolio. Dealers secure the outstanding intraday credit with high-quality liquid collateral having a market value in excess of the amount of the outstanding credit.

Our bank exposure primarily relates to our global trade finance. These exposures are short-term in nature, with 96% due in less than one year. The investment grade percentage of our bank exposure was 68% at Dec. 31, 2017, compared with 69% at Dec. 31, 2016, reflecting our non-investment grade exposure to Brazil. Our exposure in Brazil includes \$1.3 billion in loans, which are primarily short-term trade finance loans extended to large financial institutions.

The asset manager portfolio exposure was high-quality with 99% of the exposures meeting our investment grade equivalent ratings criteria as of Dec. 31, 2017. These exposures are generally short-term liquidity facilities, with the vast majority to regulated mutual funds.

Commercial

The commercial portfolio is presented below.

Commercial portfolio exposure <i>(dollar amounts in billions)</i>	Dec. 31, 2017						Dec. 31, 2016		
	Loans	Unfunded commitments	Total exposure	% Inv. grade	% due <1 yr.	Loans	Unfunded commitments	Total exposure	
Manufacturing	\$ 1.3	\$ 6.1	\$ 7.4	94%	21%	\$ 1.1	\$ 6.7	\$ 7.8	
Services and other	0.9	6.0	6.9	96	25	0.6	4.3	4.9	
Energy and utilities	0.7	4.4	5.1	95	9	0.6	4.7	5.3	
Media and telecom	—	1.5	1.5	95	15	0.3	1.8	2.1	
Total	\$ 2.9	\$ 18.0	\$ 20.9	95%	19%	\$ 2.6	\$ 17.5	\$ 20.1	

The commercial portfolio exposure increased to \$20.9 billion at Dec. 31, 2017, from \$20.1 billion at Dec. 31, 2016, primarily reflecting higher exposure in the services and other portfolio, partially offset by lower exposure in the remaining portfolios.

Utilities-related exposure represents approximately 80% of the energy and utilities portfolio. The remaining exposure in the energy and utilities portfolio, which includes exposure to exploration and production companies, refining, pipelines and integrated companies, was 77% investment grade at Dec. 31, 2017 and 76% at Dec. 31, 2016.

The following table summarizes the percentage of the financial institutions and commercial portfolio exposures that are investment grade.

Percentage of the portfolios that are investment grade	Dec. 31,		
	2017	2016	2015
Financial institutions	93%	92%	96%
Commercial	95%	94%	94%

Our credit strategy is to focus on investment grade clients that are active users of our non-credit services. The execution of our strategy has resulted in 93% of our financial institutions portfolio and 95% of our commercial portfolio rated as investment grade at Dec. 31, 2017.

Wealth management loans and mortgages

Our wealth management exposure was \$17.6 billion at Dec. 31, 2017, compared with \$16.9 billion at Dec. 31, 2016. Wealth management loans and mortgages primarily consist of loans to high-net-worth individuals, which are secured by marketable securities and/or residential property. Wealth management mortgages are primarily interest-only, adjustable-rate mortgages with a weighted-average loan-to-value ratio of 62% at origination. In the

wealth management portfolio, less than 1% of the mortgages were past due at Dec. 31, 2017.

At Dec. 31, 2017, the wealth management mortgage portfolio consisted of the following geographic concentrations: California - 24%; New York - 18%; Massachusetts - 11%; Florida - 8%; and other - 39%.

Commercial real estate

Our commercial real estate exposure totaled \$8.4 billion at Dec. 31, 2017, compared with \$7.9 billion at Dec. 31, 2016. Our income-producing commercial real estate facilities are focused on experienced owners and are structured with moderate leverage based on existing cash flows. Our commercial real estate lending activities also include construction and renovation facilities. Our client base consists of experienced developers and long-term holders of real estate assets. Loans are approved on the basis of existing or projected cash flows and supported by appraisals and knowledge of local market conditions. Development loans are structured with moderate leverage, and in many instances, involve some level of recourse to the developer.

At Dec. 31, 2017, 58% of our commercial real estate portfolio was secured. The secured portfolio is diverse by project type, with 45% secured by residential buildings, 34% secured by office buildings, 12% secured by retail properties and 9% secured by other categories. Approximately 97% of the unsecured portfolio consists of real estate investment trusts (“REITs”) and real estate operating companies, which are both predominantly investment grade.

At Dec. 31, 2017, our commercial real estate portfolio consists of the following concentrations: REITs and real estate operating companies - 41%; New York metro - 39%; and other - 20%.

Lease financings

The leasing portfolio exposure totaled \$1.3 billion at Dec. 31, 2017 compared with \$1.7 billion at Dec. 31, 2016. At Dec. 31, 2017, approximately 96% of the leasing portfolio exposure was investment grade, or investment grade equivalent.

At Dec. 31, 2017, the lease financings portfolio consisted of exposures backed by well-diversified assets, including large-ticket transportation equipment, the largest consisting of both passenger and freight train cars. Assets are both domestic and foreign-based, with primary concentrations in the United States and Germany. Approximately 44% of the portfolio is additionally secured by highly rated securities and/or secured by letters of credit from investment grade issuers. Counterparty rating equivalents at Dec. 31, 2017 were as follows:

- 46% of the counterparties were A, or better;
- 50% were BBB; and
- 4% were non-investment grade.

Other residential mortgages

The other residential mortgages portfolio primarily consists of 1-4 family residential mortgage loans and totaled \$708 million at Dec. 31, 2017 and \$854 million at Dec. 31, 2016. Included in this portfolio at Dec. 31, 2017 are \$171 million of mortgage loans purchased in 2005, 2006 and the first quarter of 2007 that are predominantly prime mortgage loans, with a small portion of Alt-A loans. As of Dec. 31, 2017, the purchased loans in this portfolio had a weighted-average loan-to-value ratio of 76% at origination and 12% of the serviced loan balance was at least 60 days

delinquent. The properties securing the prime and Alt-A mortgage loans were located (in order of concentration) in California, Florida, Virginia, the tri-state area (New York, New Jersey and Connecticut) and Maryland.

To determine the projected loss on the prime and Alt-A mortgage portfolios, we calculate the total estimated defaults of these mortgages and multiply that amount by an estimate of realizable value upon sale in the marketplace (severity).

Overdrafts

Overdrafts primarily relate to custody and securities clearance clients. Overdrafts occur on a daily basis primarily in the custody and securities clearance business and are generally repaid within two business days.

Other loans

Other loans primarily include loans to consumers that are fully collateralized with equities, mutual funds and fixed-income securities.

Margin loans

Margin loans are collateralized with marketable securities, and borrowers are required to maintain a daily collateral margin in excess of 100% of the value of the loan. Margin loans included \$4.2 billion at Dec. 31, 2017 and \$6.3 billion at Dec. 31, 2016 related to a term loan program that offers fully collateralized loans to broker-dealers.

Results of Operations (continued)

Loans by category

The following table shows loans outstanding at year-end over the last five years.

Loans by category – at year-end (in millions)	Dec. 31,				
	2017	2016	2015	2014	2013
Domestic:					
Commercial	\$ 2,744	\$ 2,286	\$ 2,115	\$ 1,390	\$ 1,534
Commercial real estate	4,900	4,639	3,899	2,524	2,001
Financial institutions	5,568	6,342	6,640	5,603	4,511
Lease financings	772	989	1,007	1,282	1,322
Wealth management loans and mortgages	16,420	15,555	13,247	11,095	9,743
Other residential mortgages	708	854	1,055	1,222	1,385
Overdrafts	963	1,055	911	1,348	1,314
Other	1,131	1,202	1,137	1,113	768
Margin loans	15,689	17,503	19,340	20,034	15,652
Total domestic	48,895	50,425	49,351	45,611	38,230
Foreign:					
Commercial	167	331	227	252	113
Commercial real estate	—	15	46	6	9
Financial institutions	7,483	8,347	9,259	7,716	9,848
Lease financings	527	736	850	889	945
Wealth management loans and mortgages	108	99	100	89	75
Other (primarily overdrafts)	4,264	4,418	3,637	4,569	2,437
Margin loans	96	87	233	—	—
Total foreign	12,645	14,033	14,352	13,521	13,427
Total loans (a)	\$ 61,540	\$ 64,458	\$ 63,703	\$ 59,132	\$ 51,657

(a) Net of unearned income of \$394 million at Dec. 31, 2017, \$527 million at Dec. 31, 2016, \$674 million at Dec. 31, 2015, \$866 million at Dec. 31, 2014 and \$1,020 million at Dec. 31, 2013, primarily on domestic and foreign lease financings.

Foreign loans

We have credit relationships in foreign markets, particularly in areas associated with our securities servicing and trade finance activities. Excluding lease financings, these activities resulted in outstanding foreign loans of \$12.1 billion at Dec. 31, 2017 and \$13.3 billion at Dec. 31, 2016. The decrease primarily resulted from lower loans to financial institutions, commercial and other loans.

Maturity of loan portfolio

The following table shows the maturity structure of our loan portfolio at Dec. 31, 2017.

(in millions)	Maturity of loan portfolio at Dec. 31, 2017 (a)			Total
	Within 1 year	Between 1 and 5 years	After 5 years	
Domestic:				
Commercial	\$ 699	\$ 1,930	\$ 115	\$ 2,744
Commercial real estate	926	2,382	1,592	4,900
Financial institutions	4,866	411	291	5,568
Overdrafts	963	—	—	963
Other	1,131	—	—	1,131
Margin loans	15,689	—	—	15,689
Subtotal	24,274	4,723	1,998	30,995
Foreign	11,483	479	48	12,010
Total	\$ 35,757	\$ 5,202 (b)	\$ 2,046 (b)	\$43,005

(a) Excludes loans collateralized by residential properties, lease financings and wealth management loans and mortgages.

(b) Variable rate loans due after one year totaled \$7.2 billion and fixed rate loans totaled \$62 million.

Asset quality and allowance for credit losses

Our credit strategy is to focus on investment grade clients who are active users of our non-credit services. Our primary exposure to the credit risk of a customer consists of funded loans, unfunded contractual commitments to lend, standby letters of credit (“SBLC”) and overdrafts associated with our custody and securities clearance businesses.

Our credit strategy complements our other services. We believe credit solidifies customer relationships and, through a disciplined allocation of capital, we can earn acceptable rates of return as part of an overall relationship.

The following table details changes in our allowance for credit losses.

Allowance for credit losses activity <i>(dollar amounts in millions)</i>	2017	2016	2015	2014	2013
Margin loans	\$ 15,785	\$ 17,590	\$ 19,573	\$ 20,034	\$ 15,652
Non-margin loans	45,755	46,868	43,708	39,077	36,005
Total loans	\$ 61,540	\$ 64,458	\$ 63,281	\$ 59,111	\$ 51,657
Average loans outstanding	57,939	61,681	60,672	54,210	48,316
Balance, Jan. 1					
Domestic	\$ 245	\$ 240	\$ 236	\$ 288	\$ 339
Foreign	36	35	44	56	48
Total allowance at Jan. 1	281	275	280	344	387
Charge-offs:					
Commercial	—	—	—	(12)	(4)
Commercial real estate	—	—	—	(2)	(1)
Financial institutions	—	—	(170)	—	—
Wealth management loans and mortgages	—	—	—	(1)	(1)
Other residential mortgages	(1)	(2)	(2)	(2)	(8)
Foreign	—	—	—	(3)	(3)
Total charge-offs	(1)	(2)	(172)	(20)	(17)
Recoveries:					
Commercial	—	—	—	1	1
Financial institutions	—	13	1	1	4
Other residential mortgages	5	5	6	2	4
Foreign	—	1	—	—	—
Total recoveries	5	19	7	4	9
Net recoveries (charge-offs)	4	17	(165)	(16)	(8)
Provision for credit losses	(24)	(11)	160	(48)	(35)
Balance, Dec. 31,					
Domestic	226	245	240	236	288
Foreign	35	36	35	44	56
Total allowance, Dec. 31,	\$ 261	\$ 281	\$ 275	\$ 280	\$ 344
Allowance for loan losses	\$ 159	\$ 169	\$ 157	\$ 191	\$ 210
Allowance for lending-related commitments	102	112	118	89	134
Net (recoveries) charge-offs to average loans outstanding	(0.01)%	(0.03)%	0.27%	0.03%	0.02%
Net (recoveries) charge-offs to total allowance for credit losses	(1.53)	(6.05)	60.00	5.71	2.33
Allowance for loan losses as a percentage of total loans	0.26	0.26	0.25	0.32	0.41
Allowance for loan losses as a percentage of non-margin loans	0.35	0.36	0.36	0.49	0.58
Total allowance for credit losses as a percentage of total loans	0.42	0.44	0.43	0.47	0.67
Total allowance for credit losses as a percentage of non-margin loans	0.57	0.60	0.63	0.72	0.96

Net recoveries of \$4 million in 2017 were primarily reflected in the other residential mortgage portfolio. Net recoveries of \$17 million in 2016 primarily reflect the receipt of trust assets from the bankruptcy proceedings of Sentinel in excess of the carrying value of \$171 million. Net charge-offs of \$165 million in 2015 were primarily reflected in the financial institutions portfolio and included a portion

of the unsecured loan to Sentinel that was reestablished in December 2015.

The provision for credit losses was a credit of \$24 million in 2017, a credit of \$11 million in 2016 and a provision of \$160 million in 2015. The provision in 2015 was primarily driven by an impairment charge related to a court decision regarding Sentinel.

We had \$15.8 billion of secured margin loans on our balance sheet at Dec. 31, 2017 compared with \$17.6 billion at Dec. 31, 2016 and \$19.6 billion at Dec. 31, 2015. We have rarely suffered a loss on these types of loans and do not allocate any of our allowance for credit losses to them. As a result, we believe that the ratio of total allowance for credit losses as a percentage of non-margin loans is a more appropriate metric to measure the adequacy of the reserve.

The allowance for loan losses and allowance for lending-related commitments represent management's estimate of losses inherent in our credit portfolio. This evaluation process is subject to numerous estimates and judgments. To the extent actual results differ from forecasts or management's judgment, the allowance for credit losses may be greater or less than future charge-offs.

Based on an evaluation of the allowance for credit losses as discussed in "Critical accounting estimates"

Nonperforming assets

The following table presents our nonperforming assets.

Nonperforming assets (dollars in millions)	Dec. 31,				
	2017	2016	2015	2014	2013
Nonperforming loans:					
Other residential mortgages	\$ 78	\$ 91	\$ 102	\$ 112	\$ 117
Wealth management loans and mortgages	7	8	11	12	11
Commercial real estate	1	—	2	1	4
Lease financings	—	4	—	—	—
Financial institutions	—	—	171	—	—
Commercial	—	—	—	—	15
Foreign	—	—	—	—	6
Total nonperforming loans	86	103	286	125	153
Other assets owned	4	4	6	3	3
Total nonperforming assets (a)	\$ 90	\$ 107	\$ 292	\$ 128	\$ 156
Nonperforming assets ratio	0.15%	0.17%	0.46%	0.22%	0.30%
Nonperforming assets ratio, excluding margin loans	0.20	0.23	0.67	0.33	0.43
Allowance for loan losses/nonperforming loans	184.9	164.1	54.9	152.8	137.3
Allowance for loan losses/nonperforming assets	176.7	157.9	53.8	149.2	134.6
Total allowance for credit losses/nonperforming loans	303.5	272.8	96.2	224.0	224.8
Total allowance for credit losses/nonperforming assets	290.0	262.6	94.2	218.8	220.5

(a) Loans of consolidated investment management funds are not part of BNY Mellon's loan portfolio. Included in the loans of consolidated investment management funds are nonperforming loans of \$53 million at Dec. 31, 2014 and \$16 million at Dec. 31, 2013. These loans are recorded at fair value and therefore do not impact the provision for credit losses and allowance for loan losses, and accordingly are excluded from the nonperforming assets table above. In the second quarter of 2015, BNY Mellon adopted the accounting guidance included in Accounting Standards Update ("ASU") 2015-02, Consolidations. As a result, we deconsolidated substantially all of the loans of consolidated investment management funds retrospectively to Jan. 1, 2015.

and Note 1 of the Notes to Consolidated Financial Statements, we have allocated our allowance for credit losses as follows.

Allocation of allowance	Dec. 31,				
	2017	2016	2015	2014	2013
Commercial	30%	29%	30%	21%	24%
Commercial real estate	29	26	22	18	12
Foreign	13	13	13	16	16
Financial institutions	9	9	11	11	14
Other residential mortgages	8	10	12	14	16
Wealth management (a)	8	8	7	8	7
Lease financing	3	5	5	12	11
Total	100%	100%	100%	100%	100%

(a) Includes the allowance for wealth management mortgages.

The allocation of the allowance for credit losses is inherently judgmental, and the entire allowance for credit losses is available to absorb credit losses regardless of the nature of the loss.

Results of Operations (continued)

Nonperforming assets activity <i>(in millions)</i>	Dec. 31, 2017	Dec. 31, 2016
Balance at beginning of year	\$ 107	\$ 292
Additions	12	20
Return to accrual status	(5)	(2)
Charge-offs	(1)	(1)
Paydowns/sales	(23)	(202)
Balance at end of year	\$ 90	\$ 107

Nonperforming assets decreased \$17 million compared with Dec. 31, 2016, primarily reflecting lower other residential mortgages and lease financings.

The nonperforming asset ratios at Dec. 31, 2015 reflect the addition of an unsecured loan in the financial institutions portfolio related to Sentinel, which was recovered in 2016.

The following table presents loans that are past due 90 days or more and still accruing interest.

Past due loans ≥ 90 days still accruing interest at year-end <i>(in millions)</i>	2017	2016	2015	2014	2013
Domestic:					
Consumer	\$ 5	\$ 7	\$ 5	\$ 6	\$ 7
Commercial	—	—	—	—	—
Total domestic	5	7	5	6	7
Foreign	—	—	—	—	—
Total past due loans	\$ 5	\$ 7	\$ 5	\$ 6	\$ 7

Loans past due 90 days or more at Dec. 31, 2017 primarily consisted of other residential mortgage loans. See Note 5 of the Notes to Consolidated Financial Statements for additional information on our past due loans. See “Nonperforming assets” in Note 1 of the Notes to Consolidated Financial Statements for our policy for placing loans on nonaccrual status.

Deposits

We receive client deposits through a variety of Investment Management and Investment Services businesses and we rely on those deposits as a low-cost and stable source of funding.

Total deposits were \$244.3 billion, an increase of 10% compared with \$221.5 billion at Dec. 31, 2016. The increase in deposits primarily reflects higher interest-bearing deposits in non-U.S. offices.

Noninterest-bearing deposits were \$82.7 billion at Dec. 31, 2017 compared with \$78.3 billion at Dec. 31, 2016. Interest-bearing deposits were \$161.6 billion at Dec. 31, 2017 compared with \$143.2 billion at Dec. 31, 2016.

The aggregate amount of deposits by foreign customers in domestic offices was \$39.9 billion and \$36.3 billion at Dec. 31, 2017 and Dec. 31, 2016, respectively.

Deposits in foreign offices totaled \$114.8 billion at Dec. 31, 2017 and \$99.0 billion at Dec. 31, 2016. The majority of these deposits were in amounts in excess of \$100,000 and were primarily overnight foreign deposits.

The following table shows the maturity breakdown of domestic time deposits of \$100,000 or more at Dec. 31, 2017.

Domestic time deposits ≥ \$100,000 at Dec. 31, 2017			
<i>(in millions)</i>	Certificates of deposit	Other time deposits	Total
3 months or less	\$ 26	\$ 34,228	\$ 34,254
Between 3 and 6 months	8	—	8
Between 6 and 12 months	11	—	11
Over 12 months	—	—	—
Total	\$ 45	\$ 34,228	\$ 34,273

Short-term borrowings

We fund ourselves primarily through deposits and, to a lesser extent, other short-term borrowings and long-term debt. Short-term borrowings consist of federal funds purchased and securities sold under repurchase agreements, payables to customers and broker-dealers, commercial paper and other borrowed funds. Certain other borrowings, for example, securities sold under repurchase agreements, require the delivery of securities as collateral.

See “Liquidity and dividends” for a discussion of long-term debt and liquidity metrics that we monitor.

Information related to federal funds purchased and securities sold under repurchase agreements is presented below.

Results of Operations (continued)

Federal funds purchased and securities sold under repurchase agreements			
<i>(dollars in millions)</i>	2017	2016	2015
Maximum month-end balance during the year	\$ 21,850	\$ 25,995	\$ 30,160
Average daily balance	\$ 19,653	\$ 14,489	\$ 16,452
Weighted-average rate during the year	1.14%	0.25%	(0.04)%
Ending balance at Dec. 31	\$ 15,163	\$ 9,989	\$ 15,002
Weighted-average rate at Dec. 31	2.33%	0.38%	0.10%

Federal funds purchased and securities sold under repurchase agreements			
<i>(dollars in millions)</i>	Quarter ended		
	Dec. 31, 2017	Sept. 30, 2017	Dec. 31, 2016
Maximum month-end balance during the quarter	\$ 20,098	\$ 21,850	\$ 12,418
Average daily balance	\$ 20,211	\$ 21,403	\$ 11,567
Weighted-average rate during the quarter	1.83%	1.30%	0.30%
Ending balance	\$ 15,163	\$ 10,314	\$ 9,989
Weighted-average rate at period end	2.33%	1.35%	0.38%

Fluctuations of federal funds purchased and securities sold under repurchase agreements between periods resulted from changes in overnight borrowing opportunities. The increase in the weighted-average rates, compared with Dec. 31, 2016, primarily reflects increases in the Fed Funds effective rate.

Information related to payables to customers and broker-dealers is presented below.

Payables to customers and broker-dealers			
<i>(dollars in millions)</i>	2017	2016	2015
Maximum month-end balance during the year	\$ 21,621	\$ 22,327	\$ 23,027
Average daily balance (a)	\$ 21,142	\$ 21,149	\$ 22,062
Weighted-average rate during the year (a)	0.34%	0.07%	0.06%
Ending balance at Dec. 31	\$ 20,184	\$ 20,987	\$ 21,900
Weighted-average rate at Dec. 31	0.56%	0.09%	0.07%

(a) The weighted-average rate is calculated based on, and is applied to, the average interest-bearing payables to customers and broker-dealers, which were \$18,984 million in 2017, \$16,925 million in 2016 and \$11,649 million in 2015.

Payables to customers and broker-dealers			
<i>(dollars in millions)</i>	Quarter ended		
	Dec. 31, 2017	Sept. 30, 2017	Dec. 31, 2016
Maximum month-end balance during the quarter	\$ 21,380	\$ 21,563	\$ 21,082
Average daily balance (a)	\$ 21,130	\$ 21,280	\$ 20,978
Weighted-average rate during the quarter (a)	0.49%	0.42%	0.07%
Ending balance	\$ 20,184	\$ 21,176	\$ 20,987
Weighted-average rate at period end	0.56%	0.43%	0.09%

(a) The weighted-average rate is calculated based on, and is applied to, the average interest-bearing payables to customers and broker-dealers, which were \$17,868 million in the fourth quarter of 2017, \$18,516 million in the third quarter of 2017 and \$17,091 million in the fourth quarter of 2016.

Payables to customers and broker-dealers represent funds awaiting re-investment and short sale proceeds payable on demand. Payables to customers and broker-dealers are driven by customer trading activity levels and market volatility.

Information related to commercial paper is presented below.

Commercial paper			
<i>(dollars in millions)</i>	2017	2016	2015
Maximum month-end balance during the year	\$ 4,714	\$ 4,950	\$ 4,849
Average daily balance	\$ 2,630	\$ 1,337	\$ 1,549
Weighted-average rate during the year	1.08%	0.37%	0.10%
Ending balance at Dec. 31	\$ 3,075	\$ —	\$ —
Weighted-average rate at Dec. 31	1.27%	—%	—%

Commercial paper			
<i>(dollars in millions)</i>	Quarter ended		
	Dec. 31, 2017	Sept. 30, 2017	Dec. 31, 2016
Maximum month-end balance during the quarter	\$ 4,714	\$ 4,277	\$ 1,239
Average daily balance	\$ 3,391	\$ 2,736	\$ 383
Weighted-average rate during the quarter	1.23%	1.15%	0.34%
Ending balance	\$ 3,075	\$ 2,501	\$ —
Weighted-average rate at period end	1.27%	1.18%	—%

The Bank of New York Mellon, our largest bank subsidiary, issues commercial paper that matures within 397 days from date of issue and is not redeemable prior to maturity or subject to voluntary prepayment. The increase in commercial paper

balances, compared with prior periods, primarily reflects management of overall liquidity. The increase in weighted-average rates, compared with prior periods, primarily reflects increases in the Fed Funds effective rate and the issuance of higher-yielding term commercial paper.

Information related to other borrowed funds is presented below.

Other borrowed funds <i>(dollars in millions)</i>	2017	2016	2015
Maximum month-end balance during the year	\$ 3,955	\$ 1,280	\$ 1,151
Average daily balance	\$ 1,916	\$ 846	\$ 814
Weighted-average rate during the year	1.36%	0.91%	1.12%
Ending balance at Dec. 31	\$ 3,028	\$ 754	\$ 523
Weighted-average rate at Dec. 31	1.48%	0.89%	0.97%

Other borrowed funds <i>(dollars in millions)</i>	Quarter ended		
	Dec. 31, 2017	Sept. 30, 2017	Dec. 31, 2016
Maximum month-end balance during the quarter	\$ 3,955	\$ 3,353	\$ 1,280
Average daily balance	\$ 3,421	\$ 2,197	\$ 903
Weighted-average rate during the quarter	1.46%	1.38%	0.95%
Ending balance	\$ 3,028	\$ 3,353	\$ 754
Weighted-average rate at period end	1.48%	1.56%	0.89%

Other borrowed funds primarily include borrowings from the Federal Home Loan Bank (“FHLB”), overdrafts of sub-custodian account balances in our Investment Services businesses, capital lease obligations and borrowings under lines of credit by our Pershing subsidiaries. Overdrafts typically relate to timing differences for settlements. The increase in other borrowed funds balances compared with prior periods primarily reflects borrowings from the FHLB and an increase in capital lease obligations as a result of converting an operating lease to a capital lease.

Liquidity and dividends

BNY Mellon defines liquidity as the ability of the Parent and its subsidiaries to access funding or convert assets to cash quickly and efficiently, or to rollover or issue new debt, especially during periods of market stress, at a reasonable cost and in order to meet its short-term (up to one year) obligations. Funding liquidity risk is the risk that BNY Mellon

cannot meet its cash and collateral obligations at a reasonable cost for both expected and unexpected cash flow and collateral needs without adversely affecting daily operations or our financial condition. Funding liquidity risk can arise from funding mismatches, market constraints from the inability to convert assets to cash, the inability to hold or raise cash, low overnight deposits, deposit run-off or contingent liquidity events.

We also manage liquidity risks on an intra-day basis. Intraday liquidity risk is the risk that BNY Mellon cannot access funds during the business day to make payments or settle immediate obligations, usually in real time. Intraday liquidity risk can arise from timing mismatches, market constraints from an inability to convert assets to cash, an inability to raise cash intraday, low overnight deposits and/or adverse stress events.

Changes in economic conditions or exposure to credit, market, operational, legal and reputational risks also can affect BNY Mellon’s liquidity risk profile and are considered in our liquidity risk framework.

For additional information on our liquidity policy, see “Risk Management - Liquidity risk.”

Our overall approach to liquidity management is to have sources of liquidity that are sufficient in amount and diversity such that changes in funding requirements at the Parent and at our bank and broker-dealer subsidiaries can be accommodated routinely without material adverse impact on earnings, capital, daily operations or our financial condition.

BNY Mellon seeks to maintain an adequate liquidity cushion in both normal and stressed environments and seeks to diversify funding sources by line of business, customer and market segment. In addition, we monitor and control liquidity exposures and funding needs within and across significant legal entities, branches, currencies and business lines, taking into account, among other factors, any applicable restrictions on the transfer of liquidity among entities.

Additionally, we seek to maintain liquidity ratios within approved limits and liquidity risk tolerance, maintain a liquid asset buffer that can be liquidated, financed and/or pledged as necessary, and control the

levels and sources of wholesale funds. Moreover, BNY Mellon also manages potential intraday liquidity risks. We monitor and manage intraday liquidity against existing and expected intraday liquid resources (such as cash balances, remaining intraday credit capacity, intraday contingency funding and available collateral) to enable BNY Mellon to meet its intraday obligations under normal and reasonably severe stressed conditions.

When monitoring liquidity, we evaluate multiple metrics in order to have sufficient liquidity for expected and unexpected events. Metrics include cash flow mismatches, asset maturities, debt spreads, peer ratios, liquid assets, unencumbered collateral, funding sources and balance sheet liquidity ratios. We monitor the LCR, as well as various internal liquidity limits, as part of our standard analysis to monitor depositor and market funding concentration, liability maturity profile and potential liquidity draws due to off-balance sheet exposures.

The Parent's policy is to have access to sufficient unencumbered cash and cash equivalents at each quarter-end to cover forecasted debt redemptions, net interest payments and net tax payments for the following 18-month period, and to provide sufficient collateral to satisfy transactions subject to Section 23A of the Federal Reserve Act. As of Dec. 31, 2017, the Parent was in compliance with this policy.

We define available funds for internal liquidity management purposes as liquid funds (which include interest-bearing deposits with banks and federal funds sold and securities purchased under resale agreements), cash and due from banks, and interest-bearing deposits with the Federal Reserve and other central banks. The following table presents our total available funds, including liquid funds, at period end and on an average basis.

Available and liquid funds (in millions)	Dec. 31, 2017	Dec. 31, 2016	Average		
			2017	2016	2015
Available funds:					
Liquid funds:					
Interest-bearing deposits with banks	\$ 11,979	\$ 15,086	\$ 14,879	\$ 14,704	\$ 20,531
Federal funds sold and securities purchased under resale agreements	28,135	25,801	27,192	25,767	23,384
Total liquid funds	40,114	40,887	42,071	40,471	43,915
Cash and due from banks	5,382	4,822	5,039	4,308	6,180
Interest-bearing deposits with the Federal Reserve and other central banks	91,510	58,041	70,213	80,593	83,029
Total available funds	\$ 137,006	\$ 103,750	\$ 117,323	\$ 125,372	\$ 133,124
Total available funds as a percentage of total assets	37%	31%	34%	35%	36%

We had \$40.1 billion of liquid funds at Dec. 31, 2017 and \$40.9 billion at Dec. 31, 2016. Of the \$40.1 billion in liquid funds held at Dec. 31, 2017, \$12.0 billion was placed in interest-bearing deposits with large, highly rated global financial institutions with a weighted-average life to maturity of approximately 15 days. Of the \$12.0 billion, \$2.0 billion was placed with banks in the Eurozone.

Total available funds were \$137.0 billion at Dec. 31, 2017, compared with \$103.8 billion at Dec. 31, 2016. The increase was primarily due to an increase in interest-bearing deposits with the Federal Reserve and other central banks.

Average non-core sources of funds, such as money market rate accounts, federal funds purchased and securities sold under repurchase agreements, trading liabilities, commercial paper and other borrowings,

were \$33.0 billion for 2017 and \$25.2 billion for 2016. The increase primarily reflects increases in federal funds purchased and securities sold under repurchase agreements.

Average foreign deposits, primarily from our European-based Investment Services business, were \$96.2 billion for 2017, compared with \$102.4 billion for 2016. Domestic savings, interest-bearing demand and time deposits averaged \$39.4 billion for 2017 and \$46.8 billion for 2016. The decrease primarily reflects a decrease in time deposits, partially offset by an increase in demand deposits.

Average payables to customers and broker-dealers were \$19.0 billion for 2017 and \$16.9 billion for 2016. Payables to customers and broker-dealers are driven by customer trading activity and market volatility.

Long-term debt averaged \$27.4 billion for 2017 and \$23.3 billion for 2016, reflecting issuances of long-term debt.

Average noninterest-bearing deposits decreased to \$71.7 billion for 2017 from \$82.7 billion for 2016, reflecting a decrease in client deposits.

A significant reduction in our Investment Services business would reduce our access to deposits. See “Asset/liability management” for additional factors that could impact our deposit balances.

Sources of liquidity

In connection with our single point of entry resolution strategy, we have established an IHC to facilitate the provision of capital and liquidity resources to certain key subsidiaries in the event of material financial distress or failure. In 2017, we entered into a binding support agreement with those key subsidiaries and other related entities that requires the IHC to provide that support. The support agreement required the Parent to transfer its intercompany loans and most of its cash to the IHC, and requires the Parent to continue to transfer cash and other liquid financial assets to the IHC, subject to certain amounts retained by the Parent to meet its near-term cash needs. The Parent’s and the IHC’s obligations under the support agreement are secured. In connection with the initial transfer, the IHC issued unsecured subordinated funding notes to the Parent. The IHC has also provided the Parent with a committed line of credit that allows the Parent to draw funds necessary to service near-term obligations. As a result, during business-as-usual circumstances, the Parent is expected to continue to have access to the funds necessary to pay dividends, repurchase common stock, service its debt and satisfy its other obligations. The IHC is not permitted to pay dividends to the Parent if certain key capital, liquidity and operational

risk indicators are breached. Additionally, if our projected liquidity resources deteriorate so severely that resolution of the Parent becomes imminent, the committed line of credit the IHC provided to the Parent will automatically terminate, with all amounts outstanding becoming due and payable, the funding notes issued by the IHC would automatically be forgiven by the Parent and the support agreement would require the Parent to transfer most of its remaining assets (other than stock in subsidiaries and a cash reserve to fund bankruptcy expenses) to the IHC. As a result, during a period of severe financial stress, the Parent might commence bankruptcy proceedings at an earlier time than it otherwise would if the support agreement had not been implemented.

Our bank subsidiaries are subject to dividend limitations under the Federal Reserve Act, as well as national and state banking laws. Under these statutes, prior regulatory consent is required for dividends in any year that would exceed the bank’s net profits for such year combined with retained net profits for the prior two years. Additionally, such bank subsidiaries may not declare dividends in excess of net profits on hand, as defined, after deducting the amount by which the principal amount of all loans, on which interest is past due for a period of six months or more, exceeds the allowance for credit losses.

The Parent’s three major sources of liquidity are access to the debt and equity markets, dividends from its subsidiaries, and cash on hand and cash otherwise made available in business-as-usual circumstances to the Parent through a committed credit facility with our IHC.

The Parent had cash of \$451 million at Dec. 31, 2017, compared with \$8.7 billion at Dec. 31, 2016, a decrease of \$8.3 billion, primarily reflecting the transfer of cash to the IHC pursuant to the support agreement.

Results of Operations (continued)

Our ability to access the capital markets on favorable terms, or at all, is partially dependent on our credit ratings, which are as follows:

Credit ratings at Dec. 31, 2017				
	Moody's	S&P	Fitch	DBRS
Parent:				
Long-term senior debt	A1	A	AA-	AA (low)
Subordinated debt	A2	A-	A+	A (high)
Preferred stock	Baa1	BBB	BBB	A (low)
Outlook - Parent:	Stable	Stable	Stable	Stable
The Bank of New York Mellon:				
Long-term senior debt	Aa2	AA-	AA	AA
Subordinated debt	Aa3	A	A+	NR
Long-term deposits	Aa1	AA-	AA+	AA
Short-term deposits	P1	A-1+	F1+	R-1 (high)
Commercial paper	P1	A-1+	F1+	R-1 (high)
BNY Mellon, N.A.:				
Long-term senior debt	Aa2	AA-	AA ^(a)	AA
Long-term deposits	Aa1	AA-	AA+	AA
Short-term deposits	P1	A-1+	F1+	R-1 (high)
Outlook - Banks:	Stable	Stable	Stable	Stable

(a) Represents senior debt issuer default rating.

NR - Not rated.

Long-term debt totaled \$28.0 billion at Dec. 31, 2017 and \$24.5 billion at Dec. 31, 2016. The increase reflects issuances of \$4.75 billion, partially offset by the maturity of \$750 million and the redemption of trust preferred securities. The Parent has \$3.65 billion of long-term debt that will mature in 2018.

The following table presents the long-term debt issued by the Parent in 2017.

Debt issuances (in millions)	2017
Senior notes:	
2.60% senior notes due 2022	\$ 1,250
2.661% senior notes due 2023	1,000
3.25% senior notes due 2027	750
3.442% senior notes due 2028	1,000
Senior subordinated notes:	
3.30% senior subordinated notes due 2029	750
Total debt issuances	\$ 4,750

On March 20, 2017, all outstanding trust preferred securities issued by Mellon Capital III were redeemed. The redemption price for the trust preferred securities was equal to the par value plus interest accrued up to and excluding the redemption date.

In January 2018, we issued \$1.0 billion of fixed rate senior notes maturing in 2023 at an annual interest rate of 2.95% and \$750 million of fixed rate senior notes maturing in 2028 at an annual interest rate of 3.40%.

The Bank of New York Mellon, our largest bank subsidiary, issues commercial paper that matures within 397 days from date of issue and is not redeemable prior to maturity or subject to voluntary prepayment. The average commercial paper borrowings were \$2.6 billion for 2017 and \$1.3 billion for 2016. Commercial paper outstanding was \$3.1 billion at Dec. 31, 2017. There was no commercial paper outstanding at Dec. 31, 2016.

Subsequent to Dec. 31, 2017, our U.S. bank subsidiaries could declare dividends to the Parent of approximately \$6.2 billion, without the need for a regulatory waiver. In addition, at Dec. 31, 2017, non-bank subsidiaries of the Parent had liquid assets of approximately \$1.4 billion. Restrictions on our ability to obtain funds from our subsidiaries are discussed in more detail in "Supervision and Regulation - Capital Planning and Stress Testing - Payment of Dividends, Stock Repurchases and Other Capital Distributions" and in Note 17 of the Notes to Consolidated Financial Statements.

Pershing has uncommitted lines of credit in place for liquidity purposes which are guaranteed by the Parent. Pershing has eight separate uncommitted lines of credit amounting to \$1.5 billion in aggregate. There were no borrowings under these lines in 2017. Pershing Limited, an indirect UK-based subsidiary of BNY Mellon, has two separate uncommitted lines of credit amounting to \$250 million in aggregate. Average borrowings under these lines were \$5 million, in aggregate, in 2017.

The double leverage ratio is the ratio of our equity investment in subsidiaries divided by our consolidated parent company equity, which includes our noncumulative perpetual preferred stock. In short, the double leverage ratio measures the extent to which equity in subsidiaries is financed by Parent company debt. As the double leverage ratio increases, this can reflect greater demands on a company's cash flows in order to service interest payments and debt maturities. BNY Mellon's double leverage ratio is managed in a range considering the high level of unencumbered available liquid assets held in its principal subsidiaries (such as central bank deposits and government securities), the Company's cash generating fee-based business model, with fee revenue representing 78% of total revenue, and the dividend capacity of our banking subsidiaries. Our double leverage ratio was 122.5% at Dec. 31, 2017 and 119.1% at Dec. 31, 2016, and within the range targeted by management.

Uses of funds

The Parent's major uses of funds are payment of dividends, repurchases of common stock, principal and interest payments on its borrowings, acquisitions and additional investments in its subsidiaries.

In 2017, we paid dividends of \$1.1 billion on our common and preferred stock. Included in our 2017 capital plan was a 26% increase in the quarterly cash dividend on common stock to \$0.24 per share in the third quarter of 2017. Our common stock dividend payout ratio was 23% for 2017. The Federal Reserve's instructions for the 2018 CCAR provide that, for large bank holding companies ("BHCs") like us, dividend payout ratios exceeding 30% of after-tax net income will receive particularly close scrutiny.

In 2017, we repurchased 54.5 million common shares at an average price of \$49.28 per common share for a total cost of \$2.7 billion.

Liquidity coverage ratio

U.S. regulators have established an LCR that requires certain banking organizations, including BNY Mellon, to maintain a minimum amount of unencumbered high-quality liquid assets ("HQLA") sufficient to withstand the net cash outflow under a hypothetical standardized acute liquidity stress scenario for a 30-day time horizon.

The following table presents the consolidated HQLA at Dec. 31, 2017, and the average HQLA and average LCR for the fourth quarter of 2017.

Consolidated HQLA and LCR <i>(dollars in billions)</i>	Dec. 31, 2017
Securities (a)	\$ 107
Cash (b)	86
Total consolidated HQLA (c)	\$ 193
Total consolidated HQLA - average (c)	\$ 170
Average LCR	118%

- (a) *Primarily includes U.S. Treasury, U.S. agency, sovereign securities, securities of U.S. government-sponsored enterprises and investment-grade corporate debt.*
- (b) *Primarily includes cash on deposit with central banks.*
- (c) *Consolidated HQLA presented before adjustments. After haircuts and the impact of trapped liquidity, consolidated HQLA totaled \$154 billion at Dec. 31, 2017 and averaged \$130 billion for the fourth quarter of 2017.*

The U.S. LCR rule became fully phased-in on Jan. 1, 2017 and requires BNY Mellon and each of our affected domestic bank subsidiaries to meet an LCR of at least 100%. BNY Mellon and each of our domestic bank subsidiaries were compliant with the U.S. LCR requirements throughout 2017.

We also perform liquidity stress tests to evaluate whether the Company maintains sufficient liquidity resources under multiple stress scenarios, including stress tests required by rules adopted by the Federal Reserve under the Dodd-Frank Act. Stress tests are based on scenarios that measure liquidity risks under unlikely but plausible conditions. We perform these tests under various time horizons ranging from one day to one year in a base case, as well as supplemental tests to determine whether the Company's liquidity is sufficient for severe market events and firm-specific events. Under our scenario testing program, the results of the tests indicate that the Company has sufficient liquidity.

As part of our resolution planning, we monitor, among other measures, our Resolution Liquidity

Adequacy and Positioning (“RLAP”). The RLAP methodologies are designed to ensure that the liquidity needs of certain key subsidiaries in a stress environment can be met by available resources held at the entity or at the Parent or IHC, as applicable.

Statement of cash flows

The following summarizes the activity reflected on the statement of cash flows. While this information may be helpful to highlight certain macro trends and business strategies, the cash flow analysis may not be as relevant when analyzing changes in our net earnings and net assets. We believe that in addition to the traditional cash flow analysis, the discussion related to liquidity and dividends and asset/liability management herein may provide more useful context in evaluating our liquidity position and related activity.

Net cash provided by operating activities was \$4.6 billion in 2017, compared with \$6.2 billion in 2016 and \$4.1 billion in 2015. In 2017, 2016 and 2015, cash flows provided by operations were principally the result of earnings. In 2017, cash provided by operations was partially offset by changes in trading assets and liabilities. In 2016, cash flows provided by operations also reflect changes in trading assets and liabilities, partially offset by changes in accruals and other balances.

Net cash used for investing activities was \$31.1 billion in 2017, compared with net cash provided by investing activities of \$51.2 billion in 2016 and net cash used for investing activities of \$19.8 billion in 2015. In 2017, 2016 and 2015, net cash used for, or provided by, investing activities primarily reflects changes in interest-bearing deposits with the Federal Reserve and other central banks.

Net cash provided by financing activities was \$26.8 billion in 2017, compared with net cash used for financing activities of \$59.1 billion in 2016 and net cash provided by financing activity of \$15.2 billion in 2015. In 2017, 2016 and 2015, net cash provided by, or used for, financing activities primarily reflects changes in deposits and changes in federal funds purchased and securities sold under repurchase agreements. In 2017, net cash provided by financing activities also reflects net proceeds from the issuance of long-term debt, changes in commercial paper and other borrowed funds, partially offset by common stock repurchases. In 2016, net cash used for financing activities also reflects repayment of long-term debt and common stock repurchases, partially offset by the net proceeds from the issuance of long-term debt. In 2015, net cash provided by financing activities also reflects the net change in long-term debt and common stock repurchases.

Commitments and obligations

We have contractual obligations to make fixed and determinable payments to third parties as indicated in the table below. The table excludes certain obligations such as trade payables and trading liabilities, where the obligation is short-term or subject to valuation based on market factors. In addition to the amounts shown in the table below, at Dec. 31, 2017, \$128 million of unrecognized tax benefits have been recorded as liabilities in accordance with ASC 740, *Income Taxes*. Related to these unrecognized tax benefits, we have also recorded a liability for potential interest of \$17 million. At this point, it is not possible to determine when these amounts will be settled or resolved.

Contractual obligations at Dec. 31, 2017 <i>(in millions)</i>	Total	Payments due by period			
		Less than 1 year	1-3 years	3-5 years	Over 5 years
Deposits without a stated maturity	\$ 122,373	\$ 122,373	\$ —	\$ —	\$ —
Term deposits	40,021	40,019	2	—	—
Federal funds purchased and securities sold under repurchase agreements	15,163	15,163	—	—	—
Payables to customers and broker-dealers	20,184	20,184	—	—	—
Other borrowed funds (a)	3,028	3,026	2	—	—
Long-term debt (b)	31,403	4,385	9,388	6,260	11,370
Unfunded pension and post-retirement benefits	292	48	63	55	126
Investment commitments (c)	486	200	226	43	17
Repatriation tax	723	27	112	112	472
Total contractual obligations	\$ 233,673	\$ 205,425	\$ 9,793	\$ 6,470	\$ 11,985

(a) Includes capital leases.

(b) Includes interest.

(c) Includes Community Reinvestment Act commitments.

Results of Operations (continued)

We have entered into fixed and determinable commitments as indicated in the table below:

<i>(in millions)</i>	Total	Amount of commitment expiration per period			
		Less than 1 year	1-3 years	3-5 years	Over 5 years
Securities lending indemnifications (a)	\$ 432,084	\$ 432,084	\$ —	\$ —	\$ —
Lending commitments	51,467	30,068	8,997	12,205	197
Standby letters of credit	3,531	2,482	666	383	—
Operating leases	2,018	292	541	431	754
Purchase obligations (b)	1,395	740	394	169	92
Commercial letters of credit	122	122	—	—	—
Private equity commitments (c)	42	6	28	8	—
Total commitments	\$ 490,659	\$ 465,794	\$ 10,626	\$ 13,196	\$ 1,043

(a) Excludes the indemnifications for securities booked at BNY Mellon beginning in late 2013 resulting from the CIBC Mellon joint venture, which totaled \$69 billion at Dec. 31, 2017.

(b) Purchase obligations are defined as agreements to purchase goods or services that are enforceable and legally binding and specify all significant terms.

(c) Related to SBIC investments, which are compliant with the Volcker Rule.

See “Liquidity and dividends” and Note 20 of the Notes to Consolidated Financial Statements for a further discussion of the source of funds for our commitments and obligations.

Off-balance sheet arrangements

Off-balance sheet arrangements discussed in this section are limited to guarantees, retained or contingent interests and obligations arising out of

unconsolidated variable interest entities (“VIEs”). For BNY Mellon, these items include certain guarantees. Guarantees include SBLC issued as part of our corporate banking business and securities lending indemnifications issued as part of our Investment Services business. See Note 20 of the Notes to Consolidated Financial Statements for a further discussion of our off-balance sheet arrangements.

Capital

Capital data <i>(dollar amounts in millions except per share amounts; common shares in thousands)</i>	2017	2016
At period end:		
BNY Mellon shareholders’ equity to total assets ratio	11.1%	11.6%
BNY Mellon common shareholders’ equity to total assets ratio	10.1%	10.6%
Total BNY Mellon shareholders’ equity	\$ 41,251	\$ 38,811
Total BNY Mellon common shareholders’ equity	\$ 37,709	\$ 35,269
BNY Mellon tangible common shareholders’ equity – Non-GAAP (a)	\$ 18,486	\$ 16,957
Book value per common share (a)	\$ 37.21	\$ 33.67
Tangible book value per common share – Non-GAAP (a)	\$ 18.24	\$ 16.19
Closing stock price per common share	\$ 53.86	\$ 47.38
Market capitalization	\$ 54,584	\$ 49,630
Common shares outstanding	1,013,442	1,047,488
Full-year:		
Average common equity to average assets	10.5%	9.9%
Cash dividends per common share	\$ 0.86	\$ 0.72
Common dividend payout ratio	23%	23%
Common dividend yield	1.6%	1.5%

(a) See “Supplemental information – Explanation of GAAP and Non-GAAP financial measures” beginning on page 118 for a reconciliation of GAAP to Non-GAAP.

The Bank of New York Mellon Corporation total shareholders' equity increased to \$41.3 billion at Dec. 31, 2017 from \$38.8 billion at Dec. 31, 2016. The increase primarily reflects earnings, foreign currency translation adjustments and \$739 million resulting from stock awards, the exercise of stock options and stock issued for employee benefit plans, partially offset by share repurchases and dividends.

The unrealized gain, net of tax, on our available-for-sale investment securities portfolio included in accumulated other comprehensive income was \$184 million at Dec. 31, 2017, compared with \$45 million at Dec. 31, 2016. The increase in the unrealized gain, net of tax, was primarily driven by a decrease in long-term interest rates.

Our 2017 capital plan, submitted in connection with the Federal Reserve's CCAR, included the authorization to repurchase an average of \$650 million of common stock each quarter starting in the third quarter of 2017 and continuing through the second quarter of 2018. We repurchased 25 million common shares at an average price of \$52.68 per common share for a total cost of \$1.3 billion in 2017 under the current program. We expect to continue to repurchase shares in the first half of 2018 under the 2017 capital plan.

Also included in the 2017 capital plan was a 26% increase in the quarterly cash dividend to \$0.24 per common share. The first payment of the increased quarterly cash dividend was made on Aug. 11, 2017.

Capital adequacy

Regulators establish certain levels of capital for BHCs and banks, including BNY Mellon and our bank subsidiaries, in accordance with established quantitative measurements. For the Parent to maintain its status as a financial holding company ("FHC"), our U.S. bank subsidiaries and BNY Mellon must, among other things, qualify as "well capitalized." As of Dec. 31, 2017 and Dec. 31, 2016, BNY Mellon and our U.S. bank subsidiaries were "well capitalized."

Failure to satisfy regulatory standards, including "well capitalized" status or capital adequacy rules more generally, could result in limitations on our activities and adversely affect our financial condition. See the discussion of these matters in "Supervision and Regulation - Regulated Entities of BNY Mellon and Ancillary Regulatory Requirements" and "Risk Factors - Operational Risk - Failure to satisfy regulatory standards, including "well capitalized" and "well managed" status or capital adequacy and liquidity rules more generally, could result in limitations on our activities and adversely affect our business and financial condition."

The "well capitalized" and other capital categories (where applicable), as established by applicable regulations for BHCs and depository institutions, have been established by those regulations solely for purposes of implementing their respective requirements (for example, eligibility for FHC status in the case of BHCs and prompt corrective action measures in the case of depository institutions). A BHC's or depository institution's qualification for a capital category may not constitute an accurate representation of the entity's overall financial condition or prospects.

The U.S. banking agencies' capital rules are based on the framework adopted by the Basel Committee on Banking Supervision ("BCBS"), as amended from time to time. For additional information on these capital requirements, see "Supervision and Regulation." BNY Mellon is subject to the U.S. capital rules, which are being gradually phased-in over a multi-year period through Jan. 1, 2019.

Our estimated CET1 and SLR ratios on a fully phased-in basis are based on our current interpretation of the U.S. capital rules. Our risk-based capital adequacy is determined using the higher of RWAs determined using the Advanced Approach and Standardized Approach.

Results of Operations (continued)

The transitional capital ratios for Dec. 31, 2017 included in the following table were negatively impacted by the additional phase-in requirements that became effective on Jan. 1, 2017.

Consolidated and largest bank subsidiary regulatory capital ratios	Dec. 31, 2017			Dec. 31, 2016
	Well capitalized	Minimum required <i>(a)</i>	Capital ratios	
Consolidated regulatory capital ratios: <i>(b)</i>				
Standardized Approach:				
CET1 ratio	N/A <i>(c)</i>	6.5%	11.9%	12.3%
Tier 1 capital ratio	6%	8	14.2	14.5
Total (Tier 1 plus Tier 2) capital ratio	10	10	15.1	15.2
Advanced Approach:				
CET1 ratio	N/A <i>(c)</i>	6.5%	10.7%	10.6%
Tier 1 capital ratio	6%	8	12.7	12.6
Total (Tier 1 plus Tier 2) capital ratio	10	10	13.4	13.0
Leverage capital ratio <i>(b)</i>	N/A <i>(c)</i>	4	6.6	6.6
SLR <i>(d)</i>	5 <i>(c)(e)</i>	3	6.1	6.0
Selected regulatory capital ratios – fully phased-in – Non-GAAP: <i>(c)</i>				
Estimated CET1 ratio:				
Standardized Approach	8.5% <i>(e)</i>	6.5%	11.5%	11.3%
Advanced Approach	8.5 <i>(e)</i>	6.5	10.3	9.7
Estimated SLR	5 <i>(e)</i>	3	5.9	5.6
The Bank of New York Mellon regulatory capital ratios: <i>(b)</i>				
Advanced Approach:				
CET1 ratio	6.5%	5.75%	14.1%	13.6%
Tier 1 capital ratio	8	7.25	14.4	13.9
Total (Tier 1 plus Tier 2) capital ratio	10	9.25	14.7	14.2
Leverage capital ratio	5	4	7.6	7.2
SLR <i>(d)</i>	6	3	6.9	6.5
Selected regulatory capital ratios – fully phased-in – Non-GAAP:				
Estimated SLR	6%	3%	6.7%	6.1%

(a) Minimum requirements for Dec. 31, 2017 include Basel III minimum thresholds plus currently applicable buffers.

(b) For our CET1, Tier 1 capital and Total capital ratios, our effective capital ratios under U.S. capital rules are the lower of the ratios as calculated under the Standardized and Advanced Approaches. The leverage capital ratio is based on Tier 1 capital, as phased-in and quarterly average total assets.

(c) The Federal Reserve's regulations do not establish well capitalized thresholds for these measures for BHCs.

(d) SLR became a binding measure on Jan. 1, 2018. The SLR is based on Tier 1 capital, as phased-in, and average quarterly assets and certain off-balance sheet exposures.

(e) Fully phased-in Basel III minimum with expected buffers. See page 57 for the capital ratios with the phase-in of the capital conservation buffer and the U.S. G-SIB surcharge, as well as the introduction of the SLR buffer.

Our CET1 ratio determined under the Advanced Approach was 10.7% at Dec. 31, 2017 and 10.6% at Dec. 31, 2016. The increase primarily reflects CET1 generation, partially offset by the additional phase-in requirements under the U.S. capital rules that became effective Jan. 1, 2017 and the impact of U.S. tax legislation.

Our estimated CET1 ratio calculated under the Advanced Approach on a fully phased-in basis (Non-GAAP) was 10.3% at Dec. 31, 2017 and 9.7% at Dec. 31, 2016. The increase primarily reflects CET1 generation, partially offset by the impact of U.S. tax legislation. U.S. tax legislation had a negative impact on regulatory capital, resulting in a \$551 million

decrease, driven by the repatriation tax, offset by the tax benefit related to the remeasurement of certain deferred tax liabilities. Our estimated CET1 ratio calculated under the Standardized Approach on a fully phased-in basis (Non-GAAP) was 11.5% at Dec. 31, 2017 and 11.3% at Dec. 31, 2016.

The estimated fully phased-in SLR (Non-GAAP) of 5.9% at Dec. 31, 2017 and 5.6% at Dec. 31, 2016 was based on our interpretation of the U.S. capital rules, as supplemented by the Federal Reserve's final rules on the SLR. BNY Mellon will be subject to an enhanced SLR, which will require a buffer in excess of 2% over the minimum SLR of 3%. The insured depository institution subsidiaries of the U.S. G-SIBs,

including those of BNY Mellon, must maintain a 6% SLR to be considered “well capitalized.”

For additional information on the U.S. capital rules, see “Supervision and Regulation - Capital Requirements - Generally.”

The Advanced Approach capital ratios are significantly impacted by RWAs for operational risk. Our operational loss risk model is informed by external losses, including fines and penalties levied against institutions in the financial services industry, particularly those that relate to businesses in which we operate, and as a result external losses have impacted and could in the future impact the amount of capital that we are required to hold.

Management views the estimated fully phased-in CET1 and other risk-based capital ratios and SLR as key measures in monitoring BNY Mellon’s capital position and progress against future regulatory capital standards. Additionally, the presentation of the estimated fully phased-in CET1 and other risk-based capital ratios and SLR are intended to allow investors to compare these ratios with estimates presented by other companies.

Our capital ratios are necessarily subject to, among other things, anticipated compliance with all necessary enhancements to model calibration, approval by regulators of certain models used as part of RWA calculations, other refinements, further implementation guidance from regulators, market practices and standards and any changes BNY Mellon may make to its businesses. As a consequence of these factors, our capital ratios may materially change, and may be volatile over time and from period to period.

Minimum capital ratios and capital buffers

The U.S. capital rules include a series of buffers and surcharges over required minimums that apply to BHCs, including BNY Mellon, which are being phased-in over time. Banking organizations with a risk-based ratio or SLR above the minimum required level, but with a risk-based ratio or SLR below the minimum level with buffers will face constraints on

dividends, equity repurchases and discretionary executive compensation based on the amount of the shortfall. Different regulatory capital minimums, buffers and surcharges apply to our banking subsidiaries.

The U.S. capital rules introduced a capital conservation buffer and countercyclical capital buffer that add to the minimum regulatory capital ratios. The capital conservation buffer—1.25% for 2017 and 2.5% when fully phased-in on Jan. 1, 2019—is designed to absorb losses during periods of economic stress and applies to all banking organizations. During periods of excessive growth, the capital conservation buffer may be expanded through the imposition of a countercyclical capital buffer that may be as high as an additional 2.5%. The countercyclical capital buffer, when applicable, applies only to Advanced Approach banking organizations. The countercyclical capital buffer is currently set to zero with respect to U.S. exposures, but it could increase if the banking agencies determine that systemic vulnerabilities are meaningfully above normal.

BNY Mellon is subject to an additional G-SIB surcharge, which is implemented as an extension of the capital conservation buffer and must be satisfied with CET1 capital. For 2017, the G-SIB surcharge applicable to BNY Mellon is 0.75%, and for 2018 it is 1.125%, when fully phased-in on Jan. 1, 2019, as calculated, applying metrics as currently applicable to BNY Mellon, it would be 1.5%.

The following table presents the principal minimum capital ratio requirements with buffers and surcharges, as phased-in, applicable to the Parent and The Bank of New York Mellon. This table does not include the imposition of a countercyclical capital buffer. The U.S. capital rules also provide for transitional arrangements for qualifying instruments, deductions and adjustments, which are not reflected in this table. Buffers and surcharges are not applicable to the leverage capital ratio. These buffers, other than the SLR buffer, and surcharge began to phase-in on Jan. 1, 2016 and will be fully implemented on Jan. 1, 2019.

Results of Operations (continued)

Capital ratio requirements	Well capitalized	Minimum ratios	Minimum ratios with buffers, as phased-in (a)		
			2017	2018	2019
Capital conservation buffer (CET1)			1.25%	1.875%	2.5%
U.S. G-SIB surcharge (CET1) (b)(c)			0.75%	1.125%	1.5%
Consolidated:					
CET1 ratio	N/A	4.5%	6.5%	7.5%	8.5%
Tier 1 capital ratio	6.0%	6.0%	8.0%	9.0%	10.0%
Total capital ratio	10.0%	8.0%	10.0%	11.0%	12.0%
Enhanced SLR buffer (Tier 1 capital)	N/A		N/A	2.0%	2.0%
SLR	N/A	3.0%	N/A	5.0%	5.0%
Bank subsidiaries: (c)					
CET1 ratio	6.5%	4.5%	5.75%	6.375%	7.0%
Tier 1 capital ratio	8.0%	6.0%	7.25%	7.875%	8.5%
Total capital ratio	10.0%	8.0%	9.25%	9.875%	10.5%
SLR	6.0%	3.0%	N/A	6.0% (d)	6.0% (d)

(a) Countercyclical capital buffer currently set to 0%.

(b) The fully phased-in U.S. G-SIB surcharge of 1.5% applicable to BNY Mellon is subject to change.

(c) The U.S. G-SIB surcharge is not applicable to the regulatory capital ratios of the bank subsidiaries.

(d) Well capitalized threshold.

The table below presents the factors that impacted the transitional and fully phased-in CET1.

Estimated CET1 generation	Year ended Dec. 31, 2017	
	Transitional Approach (a)	Fully phased-in – Non-GAAP (b)
(in millions)		
CET1 – Beginning of period	\$ 18,093	\$ 16,490
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	3,915	3,915
Goodwill and intangible assets, net of related deferred tax liabilities	(1,370)	(911)
Gross CET1 generated	2,545	3,004
Capital deployed:		
Common stock dividends	(901)	(901)
Common stock repurchased	(2,686)	(2,686)
Total capital deployed	(3,587)	(3,587)
Other comprehensive income:		
Foreign currency translation	838	838
Unrealized loss on assets available-for-sale	127	151
Defined benefit plans	59	410
Unrealized gain on cash flow hedges	9	9
Total other comprehensive income	1,033	1,408
Additional paid-in capital (c)	703	703
Other additions (deductions):		
Net pension fund assets	(114)	(121)
Deferred tax assets	(14)	(9)
Embedded goodwill	(59)	(43)
Other	(7)	(7)
Total other deductions	(194)	(180)
Net CET1 generated	500	1,348
CET1 – End of period	\$ 18,593	\$ 17,838

(a) Reflects transitional adjustments to CET1 required under the U.S. capital rules.

(b) Estimated.

(c) Primarily related to stock awards, the exercise of stock options and stock issued for employee benefit plans.

Results of Operations (continued)

The following table presents the components of our transitional and fully phased-in CET1, Tier 1 and Tier 2 capital, the RWAs determined under both the Standardized and Advanced Approaches, the average assets used for leverage capital purposes and the total leverage exposure for estimated SLR purposes.

Capital components and ratios <i>(dollars in millions)</i>	Dec. 31, 2017		Dec. 31, 2016	
	Transitional Approach (a)	Fully phased-in – Non-GAAP (b)	Transitional Approach (a)	Fully phased-in – Non-GAAP (b)
CET1:				
Common shareholders' equity	\$ 37,859	\$ 37,709	\$ 35,794	\$ 35,269
Goodwill and intangible assets	(18,684)	(19,223)	(17,314)	(18,312)
Net pension fund assets	(169)	(211)	(55)	(90)
Equity method investments	(372)	(387)	(313)	(344)
Deferred tax assets	(33)	(41)	(19)	(32)
Other	(8)	(9)	—	(1)
Total CET1	18,593	17,838	18,093	16,490
Other Tier 1 capital:				
Preferred stock	3,542	3,542	3,542	3,542
Deferred tax assets	(8)	—	(13)	—
Net pension fund assets	(42)	—	(36)	—
Other	(41)	(41)	(121)	(121)
Total Tier 1 capital	\$ 22,044	\$ 21,339	\$ 21,465	\$ 19,911
Tier 2 capital:				
Subordinated debt	\$ 1,250	\$ 1,250	\$ 550	\$ 550
Allowance for credit losses	261	261	281	281
Trust preferred securities	—	—	148	—
Other	(12)	(12)	(12)	(11)
Total Tier 2 capital – Standardized Approach	1,499	1,499	967	820
Excess of expected credit losses	31	31	50	50
Less: Allowance for credit losses	261	261	281	281
Total Tier 2 capital – Advanced Approach	\$ 1,269	\$ 1,269	\$ 736	\$ 589
Total capital:				
Standardized Approach	\$ 23,543	\$ 22,838	\$ 22,432	\$ 20,731
Advanced Approach	\$ 23,313	\$ 22,608	\$ 22,201	\$ 20,500
Risk-weighted assets:				
Standardized Approach	\$ 155,621	\$ 155,324	\$ 147,671	\$ 146,475
Advanced Approach:				
Credit Risk	\$ 101,681	\$ 101,366	\$ 97,659	\$ 96,391
Market Risk	3,657	3,657	2,836	2,836
Operational Risk	68,688	68,688	70,000	70,000
Total Advanced Approach	\$ 174,026	\$ 173,711	\$ 170,495	\$ 169,227
Standardized Approach:				
CET1 ratio	11.9%	11.5%	12.3%	11.3%
Tier 1 capital ratio	14.2	13.7	14.5	13.6
Total (Tier 1 plus Tier 2) capital ratio	15.1	14.7	15.2	14.2
Advanced Approach:				
CET1 ratio	10.7%	10.3%	10.6%	9.7%
Tier 1 capital ratio	12.7	12.3	12.6	11.8
Total (Tier 1 plus Tier 2) capital ratio	13.4	13.0	13.0	12.1
Average assets for leverage capital purposes	\$ 331,600		\$ 326,809	
Total leverage exposure for SLR purposes		\$ 360,543		\$ 355,083

(a) Reflects transitional adjustments to CET1, Tier 1 capital and Tier 2 capital required in 2017 and 2016 under the U.S. capital rules.

(b) Estimated.

The following table shows the impact on the consolidated capital ratios at Dec. 31, 2017 of a \$100 million increase or decrease in common equity, or a \$1 billion increase or decrease in RWAs, quarterly average assets or total leverage exposure.

<i>(in basis points)</i>	Sensitivity of consolidated capital ratios at Dec. 31, 2017	
	Increase or decrease of	
	\$100 million in common equity	\$1 billion in RWA, quarterly average assets or total leverage exposure
CET1:		
Standardized Approach	6 bps	8 bps
Advanced Approach	6	6
Tier 1 capital:		
Standardized Approach	6	9
Advanced Approach	6	7
Total capital:		
Standardized Approach	6	10
Advanced Approach	6	8
Leverage capital	3	2
SLR	3	2
Estimated CET1 ratio, fully phased-in – Non-GAAP:		
Standardized Approach	6	7
Advanced Approach	6	6
Estimated SLR, fully phased-in – Non-GAAP	3	2

Capital ratios vary depending on the size of the balance sheet at year-end and the levels and types of investments in assets. The balance sheet size fluctuates from year to year based on levels of customer and market activity. In general, when servicing clients are more actively trading securities, deposit balances and the balance sheet as a whole are higher. In addition, when markets experience significant volatility or stress, our balance sheet size may increase considerably as client deposit levels increase.

Supplementary Leverage Ratio

BNY Mellon has presented its consolidated and largest bank subsidiary's estimated fully phased-in SLRs based on its interpretation of the U.S. capital rules, which are being gradually phased-in over a multi-year period and on the application of such rules to BNY Mellon's businesses as currently conducted.

Results of Operations (continued)

The following table presents the components of our SLR on both the transitional and fully phased-in basis for BNY Mellon and our largest bank subsidiary, The Bank of New York Mellon.

SLR	Dec. 31, 2017		Dec. 31, 2016	
	Transitional basis	Fully phased-in – Non-GAAP (a)	Transitional basis	Fully phased-in – Non-GAAP (a)
<i>(dollars in millions)</i>				
Consolidated:				
Total Tier 1 capital	\$ 22,044	\$ 21,339	\$ 21,465	\$ 19,911
Total leverage exposure:				
Quarterly average total assets	\$ 350,786	\$ 350,786	\$ 344,142	\$ 344,142
Less: Amounts deducted from Tier 1 capital	19,186	19,892	17,333	18,887
Total on-balance sheet assets, as adjusted	331,600	330,894	326,809	325,255
Off-balance sheet exposures:				
Potential future exposure for derivative contracts (plus certain other items)	6,603	6,603	6,021	6,021
Repo-style transaction exposures	1,086	1,086	533	533
Credit-equivalent amount of other off-balance sheet exposures (less SLR exclusions)	21,960	21,960	23,274	23,274
Total off-balance sheet exposures	29,649	29,649	29,828	29,828
Total leverage exposure	\$ 361,249	\$ 360,543	\$ 356,637	\$ 355,083
SLR – Consolidated (b)	6.1%	5.9%	6.0%	5.6%
The Bank of New York Mellon, our largest bank subsidiary:				
Tier 1 capital	\$ 20,478	\$ 19,768	\$ 19,011	\$ 17,708
Total leverage exposure	\$ 296,510	\$ 296,224	\$ 291,022	\$ 290,230
SLR – The Bank of New York Mellon (b)	6.9%	6.7%	6.5%	6.1%

(a) Estimated.

(b) The estimated fully phased-in SLR (Non-GAAP) is based on our interpretation of the U.S. capital rules. The minimum required SLR is 3% and there is a 2% buffer; in addition to the minimum, that is applicable to U.S. G-SIBs. The insured depository institution subsidiaries of the U.S. G-SIBs, including those of BNY Mellon, must maintain a 6% SLR to be considered “well-capitalized.”

Issuer purchases of equity securities

Share repurchases - fourth quarter of 2017

<i>(dollars in millions, except per share information; common shares in thousands)</i>	Total shares repurchased	Average price per share	Total shares repurchased as part of a publicly announced plan or program	Maximum approximate dollar value of shares that may yet be purchased under the publicly announced plans or programs at Dec. 31, 2017
October 2017	5,306	\$ 52.60	5,306	\$ 1,671
November 2017	4,758	52.63	4,758	1,421
December 2017	2,316	52.61	2,316	1,299
Fourth quarter of 2017 (a)	12,380	\$ 52.61	12,380	\$ 1,299 (b)

(a) Includes 35 thousand shares repurchased at a purchase price of \$2 million from employees, primarily in connection with the employees' payment of taxes upon the vesting of restricted stock. The average price per share of open market purchases was \$52.61.

(b) Represents the maximum value of the shares authorized to be repurchased through the second quarter of 2018, including employee benefit plan repurchases, in connection with the Federal Reserve's non-objection to our 2017 capital plan.

On June 28, 2017, in connection with the Federal Reserve's non-objection to our 2017 capital plan, BNY Mellon announced a share repurchase plan providing for the repurchase of up to \$2.6 billion of common stock and up to an additional \$500 million of common stock contingent on a prior issuance of \$500 million of noncumulative perpetual preferred stock. The 2017 capital plan began in the third

quarter of 2017 and continues through the second quarter of 2018. This new share repurchase plan replaces all previously authorized share repurchase plans.

Share repurchases may be executed through repurchase plans designed to comply with Rule 10b5-1 and through derivative, accelerated share

repurchase and other structured transactions. The timing and exact amount of any common stock repurchases will depend on various factors, including market conditions and the common stock trading price; the Company's capital position, liquidity and financial performance; alternative uses of capital; and legal and regulatory considerations.

Trading activities and risk management

Our trading activities are focused on acting as a market-maker for our customers, facilitating customer trades and risk mitigating hedging in compliance with the Volcker Rule. The risk from market-making activities for customers is managed by our traders and limited in total exposure through a system of position limits, value-at-risk ("VaR") methodology and other market sensitivity measures. VaR is the potential loss in value due to adverse market movements over a defined time horizon with a specified confidence level. The calculation of our VaR used by management and presented below assumes a one-day holding period, utilizes a 99% confidence level, and incorporates non-linear product characteristics. VaR facilitates comparisons across portfolios of different risk characteristics. VaR also captures the diversification of aggregated risk at the firm-wide level.

VaR represents a key risk management measure and it is important to note the inherent limitations to VaR, which include:

- VaR does not estimate potential losses over longer time horizons where moves may be extreme;
- VaR does not take account of potential variability of market liquidity; and
- Previous moves in market risk factors may not produce accurate predictions of all future market moves.

See Note 21 of the Notes to Consolidated Financial Statements for additional information on the VaR methodology.

In an effort to improve our enterprise-level risk management capabilities, we have changed our VaR model from Monte Carlo simulation to historical simulation for both management and RWA calculations. This change was effective as of Jan. 1, 2017. In addition to this model enhancement, the impact of credit valuation adjustment ("CVA") is now included.

The following table indicates the calculated VaR amounts for the trading portfolio for the designated periods using the historical simulation VaR model. The impact of changes in methodology implemented on Jan.1, 2017 are not material.

VaR (a) (in millions)	2017			Dec. 31, 2017
	Average	Minimum	Maximum	
Interest rate	\$ 3.6	\$ 2.4	\$ 4.9	\$ 4.4
Foreign exchange	4.1	2.6	8.6	8.6
Equity	0.5	0.1	1.1	0.8
Credit	1.1	0.5	1.7	1.3
Diversification	(5.0)	N/M	N/M	(5.2)
Overall portfolio	4.3	3.2	9.9	9.9

(a) Beginning Jan. 1, 2017, the VaR figures reflect the impact of the CVA and hedges as per the guidance included in ASC 820, Fair Value Measurement. VaR exposure does not include the impact of the Company's consolidated investment management funds and seed capital investments.

N/M - Because the minimum and maximum may occur on different days for different risk components, it is not meaningful to compute a minimum and maximum portfolio diversification effect.

The following table indicates the calculated VaR amounts for the trading portfolio for the designated periods as previously reported under the former Monte Carlo simulation VaR model.

VaR (a) (in millions)	2016			Dec. 31, 2016
	Average	Minimum	Maximum	
Interest rate	\$ 6.3	\$ 4.3	\$ 8.9	\$ 5.5
Foreign exchange	2.9	1.2	11.1	2.8
Equity	0.6	0.3	0.8	0.4
Credit	0.3	0.2	0.4	0.3
Diversification	(4.2)	N/M	N/M	(3.7)
Overall portfolio	5.9	4.3	7.7	5.3

(a) VaR figures do not reflect the impact of the CVA guidance in ASC 820, Fair Value Measurement. This is consistent with the regulatory treatment. VaR exposure does not include the impact of the Company's consolidated investment management funds and seed capital investments.

N/M - Because the minimum and maximum may occur on different days for different risk components, it is not meaningful to compute a minimum and maximum portfolio diversification effect.

The interest rate component of VaR represents instruments whose values predominantly vary with the level or volatility of interest rates. These instruments include, but are not limited to: sovereign debt, swaps, swaptions, forward rate agreements, exchange-traded futures and options, and other interest rate derivative products.

The foreign exchange component of VaR represents instruments whose values predominantly vary with the level or volatility of currency exchange rates or interest rates. These instruments include, but are not limited to: currency balances, spot and forward transactions, currency options, exchange-traded futures and options, and other currency derivative products.

The equity component of VaR consists of instruments that represent an ownership interest in the form of domestic and foreign common stock or other equity-linked instruments. These instruments include, but are not limited to: common stock, exchange-traded funds, preferred stock, listed equity options (puts and calls), OTC equity options, equity total return swaps, equity index futures and other equity derivative products.

The credit component of VaR represents instruments whose values predominantly vary with the credit worthiness of counterparties. These instruments include, but are not limited to, credit derivatives (credit default swaps and exchange-traded credit

index instruments) and exposures from corporate credit spreads, and mortgage prepayments. Credit derivatives are used to hedge various credit exposures.

The diversification component of VaR is the risk reduction benefit that occurs when combining portfolios and offsetting positions, and from the correlated behavior of risk factor movements.

During 2017, interest rate risk generated 39% of average gross VaR, foreign exchange risk generated 44% of average gross VaR, equity risk accounted for 5% of average gross VaR and credit risk generated 12% of average gross VaR. During 2017, our daily trading loss did not exceed our calculated VaR amount of the overall portfolio.

The following table of total daily trading revenue or loss illustrates the number of trading days in which our trading revenue or loss fell within particular ranges during the past five quarters.

Distribution of trading revenue (loss) (a)	Quarter ended				
	Dec. 31, 2017	Sept. 30, 2017	June 30, 2017	March 31, 2017	Dec. 31, 2016
<i>(dollars in millions)</i>					
Revenue range:	Number of days				
Less than \$(2.5)	2	—	—	—	—
\$(2.5) – \$0	4	1	2	1	3
\$0 – \$2.5	23	29	31	31	28
\$2.5 – \$5.0	22	29	27	26	23
More than \$5.0	11	4	4	4	7

(a) Trading revenue (loss) includes realized and unrealized gains and losses primarily related to spot and forward foreign exchange transactions, derivatives and securities trades for our customers and excludes any associated commissions, underwriting fees and net interest revenue.

Trading assets include debt and equity instruments and derivative assets, primarily interest rate and foreign exchange contracts, not designated as hedging instruments. Trading assets were \$6.0 billion at Dec. 31, 2017 and \$5.7 billion at Dec. 31, 2016.

Trading liabilities include debt and equity instruments and derivative liabilities, primarily interest rate and foreign exchange contracts, not designated as hedging instruments. Trading liabilities were \$4.0 billion at Dec. 31, 2017 and \$4.4 billion at Dec. 31, 2016.

Under our fair value methodology for derivative contracts, an initial “risk-neutral” valuation is performed on each position assuming time-discounting based on a AA credit curve. In addition,

we consider credit risk in arriving at the fair value of our derivatives.

We reflect external credit ratings as well as observable credit default swap spreads for both ourselves and our counterparties when measuring the fair value of our derivative positions. Accordingly, the valuation of our derivative positions is sensitive to the current changes in our own credit spreads, as well as those of our counterparties.

At Dec. 31, 2017, our OTC derivative assets of \$3.1 billion included a CVA deduction of \$27 million. Our OTC derivative liabilities of \$3.6 billion included a debit valuation adjustment (“DVA”) of \$1 million

related to our own credit spread. Net of hedges, the CVA decreased by \$9 million and the DVA decreased \$1 million in 2017. The net impact of these adjustments increased foreign exchange and other trading revenue by \$8 million in 2017. During 2017, no realized loss was charged off against CVA reserves.

At Dec. 31, 2016, our OTC derivative assets of \$4.3 billion included a CVA deduction of \$38 million. Our OTC derivative liabilities of \$4.4 billion included a DVA of \$3 million related to our own credit spread. Net of hedges, the CVA decreased by \$16 million and the DVA decreased \$4 million in 2016. The net

impact of these adjustments increased foreign exchange and other trading revenue by \$12 million in 2016. During 2016, no realized loss was charged off against CVA reserves.

The table below summarizes the risk ratings for our foreign exchange and interest rate derivative counterparty credit exposure during the past five quarters. This information indicates the degree of risk to which we are exposed. Significant changes in ratings classifications for our foreign exchange and other trading activity could result in increased risk for us.

Foreign exchange and other trading counterparty risk rating profile (a)	Quarter ended				
	Dec. 31, 2017	Sept. 30, 2017	June 30, 2017	March 31, 2017	Dec. 31, 2016
Rating:					
AAA to AA-	44%	41%	44%	43%	35%
A+ to A-	31	30	27	36	39
BBB+ to BBB-	20	24	22	17	22
Non-investment grade (BB+ and lower)	5	5	7	4	4
Total	100%	100%	100%	100%	100%

(a) Represents credit rating agency equivalent of internal credit ratings.

Asset/liability management

Our diversified business activities include processing securities, accepting deposits, investing in securities, lending, raising money as needed to fund assets and other transactions. The market risks from these activities include interest rate risk and foreign exchange risk. Our primary market risk is exposure to movements in U.S. dollar interest rates and certain foreign currency interest rates. We actively manage interest rate sensitivity and use earnings simulation and discounted cash flow models to identify interest rate exposures.

An earnings simulation model is the primary tool used to assess changes in pre-tax net interest revenue. The model incorporates management's assumptions regarding interest rates, balance changes on core deposits, market spreads, changes in the prepayment behavior of loans and securities and the impact of derivative financial instruments used for interest rate risk management purposes. These assumptions have been developed through a combination of historical analysis and future expected pricing behavior and are inherently uncertain. As a result, the earnings simulation model cannot precisely estimate net interest revenue or the impact of higher or lower

interest rates on net interest revenue. Actual results may differ materially from projected results due to timing, magnitude and frequency of interest rate changes, and changes in market conditions and management's strategies, among other factors.

Generally, there has been an inverse relationship between interest rates and client deposit levels. To the extent that actual behavior is different from that assumed in the models, there could be a significant change in net interest revenue sensitivity.

In the table below, we use the earnings simulation model to run various interest rate ramp scenarios from a baseline scenario. The interest rate ramp scenarios examine the impact of large interest rate movements. In each scenario, all currencies' interest rates are shifted higher or lower. Interest rate sensitivity is quantified by calculating the change in pre-tax net interest revenue between the scenarios over a 12-month measurement period.

The following table shows net interest revenue sensitivity for BNY Mellon.

Estimated changes in net interest revenue <i>(in millions)</i>	Dec. 31, 2017	Sept. 30, 2017	Dec. 31, 2016
Up 200 bps parallel rate ramp vs. baseline <i>(a)</i>	\$ (151)	\$ (2)	\$ 6
Up 100 bps parallel rate ramp vs. baseline <i>(a)</i>	17	112	145
Long-term up 50 bps, short-term unchanged <i>(b)</i>	105	113	81
Long-term down 50 bps, short-term unchanged <i>(b)</i>	(122)	(129)	(88)

(a) In the parallel rate ramp, both short-term and long-term rates move in four equal quarterly increments.

(b) Long-term is equal to or greater than one year.

The baseline scenario used for the calculations in the estimated changes in net interest revenue table above is based on our quarter-end balance sheet and the spot yield curve. The 100 basis point ramp scenario assumes rates increase 25 basis points above the yield curve in each of the next four quarters and the 200 basis point ramp scenario assumes a 50 basis point per quarter increase.

Our net interest revenue sensitivity table above incorporates assumptions about the impact of changes in interest rates on depositor behavior based on historical experience. Given the current historically low interest rate environment and the potential change to the implementation of monetary policy, the impact of depositor behavior is highly uncertain. The lower sensitivity in the ramp up 200 basis point scenario compared with the 100 basis point scenario is driven by the assumption of increased deposit runoff and forecasted changes in the deposit pricing as rates rise.

Growth or contraction of deposits could also be affected by the following factors:

- Global economic uncertainty;
- Our ratings relative to other financial institutions' ratings; and
- Regulatory reform.

We also project future cash flows from our assets and liabilities over a long-term horizon and then discount these cash flows using instantaneous parallel shocks to prevailing interest rates. This measure reflects the structural balance sheet interest rate sensitivity by discounting all future cash flows. The aggregation of these discounted cash flows is the economic value of equity ("EVE"). The following table shows how the EVE would change in response to changes in interest rates.

Estimated changes in EVE	Dec. 31, 2017
Rate change:	
Up 200 bps vs. baseline	(3.7)%
Up 100 bps vs. baseline	(1.5)%

The asymmetrical accounting treatment of the impact of a change in interest rates on our balance sheet may create a situation in which an increase in interest rates can adversely affect reported equity and regulatory capital, even though economically there may be no impact on our economic capital position. For example, an increase in rates will result in a decline in the value of our available-for-sale securities portfolio. In this example, there is no corresponding change on our fixed liabilities, even though economically these liabilities are more valuable as rates rise.

These results do not reflect strategies that management could employ to limit the impact as interest rate expectations change.

To manage foreign exchange risk, we fund foreign currency-denominated assets with liability instruments denominated in the same currency. We utilize various foreign exchange contracts if a liability denominated in the same currency is not available or desired, and to minimize the earnings impact of translation gains or losses created by investments in foreign markets. We use forward foreign exchange contracts to protect the value of our net investment in foreign operations. At Dec. 31, 2017, net investments in foreign operations totaled \$14 billion and were spread across 13 foreign currencies.

Risk management overview

Governance

BNY Mellon’s management is responsible for execution of the Company’s risk appetite and the risk management and compliance framework and the governance structure that supports it, with oversight provided by BNY Mellon’s board of directors and two key board committees: the Risk Committee and the Audit Committee.

The Risk Committee is comprised entirely of independent directors and meets on a regular basis to review and assess the control processes with respect to the Company’s inherent risks. It also reviews and assesses the risk management activities of the Company and the Company’s risk policies and activities. Policy formulation and day-to-day oversight of the Company’s risk management framework is delegated to the Chief Risk Officer, who, together with the Chief Auditor and Chief Compliance Officer, helps ensure an effective risk management governance structure. The roles and responsibilities of the Risk Committee are described in more detail in its charter, a copy of which is available on our website, www.bnymellon.com.

The Audit Committee is also comprised entirely of independent directors, all of whom are financially literate within the meaning of the NYSE listing standards. Two members of the Audit Committee have been determined to be audit committee financial experts as set out in the rules and regulations under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), with accounting or related financial management expertise within the meaning of the NYSE listing standards, and to have banking and financial management expertise within the meaning of the FDIC rules. The Audit Committee meets on a regular basis to perform an oversight review of the integrity of the financial statements and financial reporting process, compliance with legal and regulatory requirements, our independent registered public accountant’s qualifications and independence, and the performance of our registered public accountant and internal audit function. The Audit Committee also reviews management’s assessment of the adequacy of internal controls. The functions of the Audit Committee are described in more detail in its charter, a copy of which is available on our website, www.bnymellon.com.

The Senior Risk Management Committee (“SRMC”) is the most senior management body responsible for ensuring that emerging risks are weighed against the corporate risk appetite. The SRMC also reviews any material breaches to our risk appetite and approves action plans required to remediate the issue. SRMC provides oversight for the risk management, compliance and ethics framework. The Chief Executive Officer, Chief Risk Officer and Chief Financial Officer are among SRMC’s members.

Primary risk types

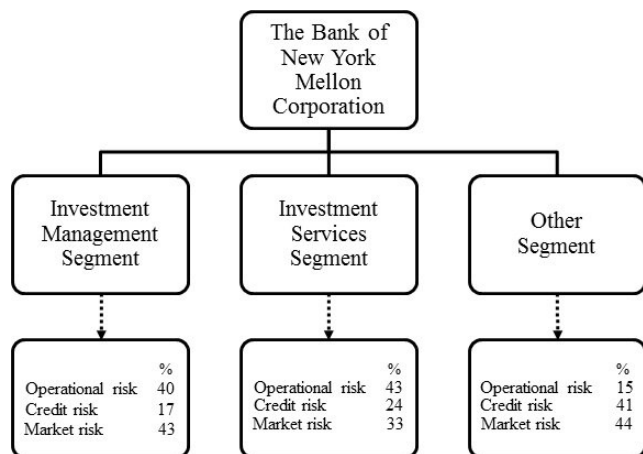
The understanding, identification and management of risk are essential elements for the successful management of BNY Mellon. Our primary risk categories are:

Type of risk	Description
Operational	The risk of loss resulting from inadequate or failed internal processes, human factors and systems, breaches of technology and information systems, or from external events. Also includes fiduciary risk, reputational risk, and litigation risk.
Market	The risk of loss due to adverse changes in the financial markets. Our market risks are primarily interest rate, foreign exchange, and equity risk. Market risk particularly impacts our exposures that are fair valued such as the securities portfolio, trading book, and equity investments.
Credit	The risk of loss if any of our borrowers or other counterparties were to default on their obligations to us. Credit risk is resident in the majority of our assets, but primarily concentrated in the loan and securities books, as well as off-balance sheet exposures such as lending commitments, letters of credit, and securities lending indemnifications.
Liquidity	The risk that BNY Mellon cannot meet its cash and collateral obligations at a reasonable cost for both expected and unexpected cash flows, without adversely affecting daily operations or financial conditions. Liquidity risk can arise from cash flow mismatches, market constraints from the inability to convert assets to cash, the inability to raise cash in the markets, deposit run-off, or contingent liquidity events.
Strategic	The risk that BNY Mellon doesn’t effectively manage and protect the firm’s market positioning and stability. This includes risks associated with the inability to maintain a strong understanding of clients’ needs, provide suitable product offerings that are financially viable and fit within the firm’s operating model and adapt to transformational change in the industry.

The following table presents the primary types of risk typically embedded in our balance sheet and our off-balance sheet instruments.

On- and off-balance sheet risks	
Assets:	
Interest-bearing deposits with banks	credit
Federal funds sold and securities purchased under resale agreements	market, credit
Securities	market, credit, liquidity
Trading assets	market, credit, liquidity
Loans	credit, liquidity
Goodwill	operational, market
Intangible assets	operational, market
Liabilities:	
Deposits	liquidity
Federal funds purchased and securities sold under repurchase agreements	market, liquidity
Trading liabilities	market, liquidity
Payables to customers and broker-dealers	liquidity
Off-balance sheet instruments:	
Lending commitments	credit, liquidity
Standby letters of credit	credit, liquidity
Commercial letters of credit	credit, liquidity
Securities lending indemnifications	market, credit

The following chart provides the economic capital allocated to our businesses. Liquidity and strategic risks are managed on a stand-alone basis at the consolidated and bank levels. Management of liquidity risk is the responsibility of Corporate Treasury, which is reported in the Other segment. The percentages below are based on the allocation of economic capital at Dec. 31, 2017 to absorb potential losses over a one-year period at a level consistent with the solvency of a target debt rating.



Operational risk

In providing a comprehensive array of products and services, we may be exposed to operational risk. Operational risk may result from, but is not limited to, errors related to transaction processing, breaches of internal control systems and compliance requirements, fraud by employees or persons outside BNY Mellon or business interruption due to system failures or other events. Operational risk may also include breaches of our technology and information systems resulting from unauthorized access to confidential information or from internal or external threats, such as cyberattacks. Operational risk also includes potential legal or regulatory actions that could arise as a result of noncompliance with applicable laws and/or regulatory requirements. In the case of an operational event, we could suffer financial losses as well as reputational damage.

To address these risks, we maintain comprehensive policies and procedures and an internal control framework designed to provide a sound operational environment. These controls have been designed to manage operational risk at appropriate levels given our financial strength, the business environment and markets in which we operate, and the nature of our businesses, and considering factors such as competition and regulation. Our internal auditors and internal control group monitor and test the overall effectiveness of our internal controls and financial reporting systems on an ongoing basis.

We have also established procedures that are designed to ensure compliance with generally accepted conduct, ethics and business practices which are defined in our corporate policies. These include training programs, such as for our “Code of Conduct” and “Know Your Customer” programs, and compliance training programs, such as those regarding information protection and suspicious activity reporting.

We have established operational risk management as an independent risk discipline. The organizational framework for operational risk is based upon a strong risk culture that incorporates both governance and risk management activities comprising:

- Board Oversight and Governance – The Risk Committee of the Board oversees our operational risk management strategy in addition to overseeing our strategic management of credit and market risk. The Risk Committee meets

regularly to review operational risk management initiatives, discuss key risk issues and review the effectiveness of the risk management systems.

- Accountability of Businesses – Business managers are responsible for maintaining an effective system of internal controls commensurate with their risk profiles and in accordance with BNY Mellon policies and procedures.
- Corporate Operational Risk Management is responsible for developing risk management policies and tools for assessing, measuring, monitoring and managing operational risk for BNY Mellon. The primary objectives of Corporate Operational Risk Management are to promote effective risk management, identify emerging risks, create incentives for generating continuous improvement in controls and to optimize capital.
- The Technology Risk Group is responsible for developing policies, methods and tools for identifying, assessing, measuring, monitoring and governing information and technology risk for BNY Mellon. Technology Risk partners with the businesses to help maintain and protect the confidentiality, integrity and availability of the portfolio reviews.

Market risk

Our business activity tends to minimize outright or direct exposure to market risk, with such risk primarily limited to market volatility from trading activity in support of clients. More significant direct market risk is assumed in the form of interest rate and credit spread risk within the investment portfolio both as a means for forward asset/liability management and net interest revenue generation.

In addition to the Risk Committee, oversight of market risk is performed by the SRMC and Balance Sheet Risk Committee (“BSRC”) and through executive review meetings. Detailed reviews of stress tests results are conducted during the Markets Weekly Risk Review. Senior managers from Risk Management, Finance and Sales and Trading attend the review. Regarding the Corporate Treasury function, oversight is provided by the Treasury Risk Committee, biweekly Portfolio Management Group risk meetings, Business Risk Committee and numerous portfolio reviews.

The Collateral Margin Review Committee reviews and approves the standards for collateral received or paid in respect of collateralized derivative agreements and securities financing transactions.

The Business Risk Committee for the Markets business also provides a forum for market risk oversight. The goal of the Business Risk Committee meeting, which is held at least quarterly, is to review key risk and control issues and related initiatives facing all lines of business, including Markets. Also addressed during the Business Risk Committee meetings are trading VaR and trading stressed VaR exposures against limits.

Finally, the Risk Quantification Review Group reviews back-testing results for the Company’s VaR model.

Credit risk

The extension of credit is not considered a discrete product and is not, typically, attributable to a specific business, but instead is used as a means of supporting our clients and our business activity more holistically. Specifically, we extend direct credit in order to foster client relationships and as a method by which to generate interest income from the deposits that result from business activity. We extend and incur intraday credit exposure in order to facilitate our various processing activities.

To balance the value of our activities with the credit risk incurred in pursuing them, we set and monitor internal credit limits for activities that entail credit risk, most often on the size of the exposure and the quality of the counterparty. For credit exposures driven by changing market rates and prices, exposure measures include an add-on for such potential changes.

We manage credit risk at both the individual exposure level as well as the portfolio level. Credit risk at the individual exposure level is managed through our credit approval system and involves four approval levels up to and including the Chief Risk Officer of the Company. The requisite approvals are based upon the size and relative risk of the aggregate exposure under consideration. The Credit Risk Group is responsible for approving the size, terms and maturity of all credit exposures as well as the ongoing monitoring of the creditworthiness of the counterparty. In addition, they are responsible for

assigning and maintaining the internal risk ratings on each exposure.

Credit risk management at the portfolio level is supported by the Enterprise Capital Adequacy Group, within Risk Management and Compliance. The Enterprise Capital Adequacy Group is responsible for calculating two fundamental credit measures. First, we project a statistically probable credit loss, used to help determine the appropriate loan loss reserve and to measure customer profitability. Credit loss considers three basic components: the estimated size of the exposure whenever default might occur, the probability of default before maturity and the severity of the loss we would incur, commonly called “loss given default.” For institutional lending, where most of our credit risk is created, unfunded commitments are assigned a usage given default percentage. Borrowers/counterparties are assigned ratings by Credit Portfolio Managers on an 18-grade scale, which translate to a scaled probability of default. Additionally, transactions are assigned loss-given-default ratings (on a 7-grade scale) that reflect the transactions’ structures including the effects of guarantees, collateral and relative seniority of position.

The second fundamental measurement of credit risk calculated by the Enterprise Capital Adequacy Group is called economic capital. Our economic capital model estimates the capital required to support the overall credit risk portfolio. Using a Monte Carlo simulation engine and measures of correlation among borrower defaults, the economic capital model examines extreme and highly unlikely scenarios of portfolio credit loss in order to estimate credit-related capital, and then allocates that capital to individual borrowers and exposures.

The Enterprise Capital Adequacy Group is responsible for the calculation methodologies and the estimates of the inputs used in those methodologies for the determination of expected loss and economic capital. These methodologies and input estimates are regularly evaluated to ensure their appropriateness and accuracy. As new techniques and data become available, the Enterprise Capital Adequacy Group attempts to incorporate, where appropriate, those techniques or data.

BNY Mellon seeks to limit both on- and off-balance sheet credit risk through prudent underwriting and the use of capital only where risk-adjusted returns warrant. We seek to manage risk and improve our

portfolio diversification through syndications, asset sales, credit enhancements and active collateralization and netting agreements. In addition, we have a separate Credit Risk Review Group, which is part of Internal Audit, made up of experienced loan review officers who perform timely reviews of the loan files and credit ratings assigned to the loans.

Liquidity risk

Access to global capital markets and financial market utilities are fundamental to both our operating model and overall strategy. Without such access, it would be difficult, if not impossible, to process payments as well as settle and clear transactions on behalf of clients. Deterioration in our liquidity position, whether actual or perceived, can impact our market access by affecting participants’ willingness to transact with us. Changes to our liquidity can be caused by various factors, such as funding mismatches, market constraints limiting the ability to liquidate assets, inability to issue debt, run-off of core deposits and contingent liquidity events, such as additional collateral posting. Changes in economic conditions or exposure to credit, market, operational, legal and reputational risks can also affect our liquidity. Our liquidity risk management practices are designed to maintain a strong liquidity profile, by actively managing both the quality of the investment portfolio and intraday liquidity positions, and by having sufficient deposits and other funding to meet timely payment and settlement obligations under both normal and stressed conditions.

Our overall approach to liquidity management is to have sources of liquidity that are sufficient in amount and diversity such that changes in funding requirements at the Parent and at our bank and broker-dealer subsidiaries can be accommodated routinely without material adverse impact on earnings, capital, daily operations or our financial condition.

The board of directors has the responsibility for oversight of liquidity risk management for the Company and approves the liquidity risk tolerances. The Asset Liability Committee (“ALCO”) is the senior management committee responsible for the oversight of liquidity management. ALCO is responsible for appropriately executing board-approved strategies, policies and procedures for managing liquidity. Senior management is responsible for regularly reporting the liquidity position of the Company to the board of directors.

The BSRC provides governance over independent Risk oversight of liquidity risks associated with assets and liabilities, liquidity risk limits calibration, and the adequacy of related control procedures. The Treasury Risk Committee, which is chaired by Independent Risk Management, is responsible for reviewing liquidity stress tests and various liquidity metrics, including contractual cash flow gaps for liquidity, liquidity stress metrics and ratios, LCR, net stable funding ratio (“NSFR”) and client deposit concentration. The Treasury Risk Committee validates and approves stress test methodologies and assumptions, and an independent liquidity Risk function provides ongoing review and oversight of liquidity risk management.

BNY Mellon seeks to maintain an adequate liquidity cushion in both normal and stressed environments and seeks to diversify funding sources by line of business, customer and market segment. Additionally, we seek to maintain liquidity ratios within approved limits and liquidity risk tolerance, maintain a liquid asset buffer that can be liquidated, financed and/or pledged as necessary, and control the levels and sources of wholesale funds.

Potential uses of liquidity include withdrawals of customer deposits and client drawdowns on unfunded credit or liquidity facilities. We actively monitor unfunded lending-related commitments, thereby reducing unanticipated funding requirements.

When monitoring liquidity, we evaluate multiple metrics in order to have sufficient liquidity for expected and unexpected events. Metrics include cash flow mismatches, asset maturities, debt spreads, peer ratios, liquid assets, unencumbered collateral, funding sources and balance sheet liquidity ratios. We monitor the LCR, as well as various internal liquidity limits as part of our standard analysis to monitor depositor and market funding concentration, liability maturity profile and potential liquidity draws due to off-balance sheet exposure.

We also perform liquidity stress tests to evaluate whether the Company maintains sufficient liquidity resources under multiple stress scenarios, including stress tests required by rules adopted by the Federal Reserve under the Dodd-Frank Act. Stress tests are based on scenarios that measure liquidity risks under unlikely but plausible conditions. The Company performs these tests under various time horizons ranging from one day to one year in a base case, as well as supplemental tests to determine whether the

Company’s liquidity is sufficient for severe market events and firm-specific events. Under our scenario testing program, the results of the tests indicate that the Company has sufficient liquidity.

Strategic Risk

Our strategy includes expanding our client base, increasing product offerings and better aligning certain business activities with market demand. Successful realization of our strategy requires that we provide expertise and insight through market-leading solutions that drive economies of scale while developing highly talented people and protecting our financial strength and stability. We understand and meet market and client expectations with suitable products and offerings that are financially viable and leverageable and that integrate into our business model.

Markets, and the manner in which our clients interact and transact within markets, can evolve quickly, such as when new or disruptive technologies are introduced. Failure to either anticipate or participate in transformational change within a given market could result in poor strategic positioning and potential negative financial impact.

Stress Testing

It is the policy of the Company to perform Enterprise-wide Stress Testing at regular intervals as part of its Internal Capital Adequacy Assessment Process (“ICAAP”). Additionally, the Company performs an analysis of capital adequacy in a stressed environment in its Enterprise-Wide Stress Test Framework, as required by the enhanced prudential standards issued pursuant to the Dodd-Frank Act.

Enterprise-Wide Stress Testing performs analyses across the Company’s lines of business, products, geographic areas, and risk types incorporating the results from the different underlying models and projections given a certain stress-test scenario. It is an important component of assessing the adequacy of capital as well as identifying any high risk touch points in business activities. Furthermore, by integrating enterprise-wide stress testing into the Company’s capital planning process, the results provide a forward-looking evaluation of the ability to complete planned capital actions in a more-adverse-than-anticipated economic environment.

Economic capital required

BNY Mellon has implemented a methodology to quantify economic capital. We define economic capital as the amount of capital required to absorb potential losses and reflects the probability of remaining solvent with a target debt rating over a one-year time horizon. We quantify economic capital requirements for the risks inherent in our business activities using statistical modeling techniques and then aggregate them at the consolidated level. A capital reduction, or diversification benefit, is applied to reflect the unlikely event of experiencing an extremely large loss in each type of risk at the same time. Economic capital requirements are directly related to our risk profile. As such, they have become a part of our ICAAP and, along with regulatory capital, are a key component to ensuring that the actual level of capital is commensurate with our risk profile and sufficient to provide the financial flexibility to undertake future strategic business initiatives.

The framework and methodologies to quantify each of our risk types have been developed by the Enterprise Capital Adequacy Group and are designed to be consistent with our risk management principles. The framework has been approved by senior management and has been reviewed by the Risk Committee of the board of directors. Due to the evolving nature of quantification techniques, we expect to continue to refine the methodologies used to estimate our economic capital requirements.

The following table presents our economic capital required at Dec. 31, 2017, on a consolidated basis.

Economic capital required at Dec. 31, 2017	
<i>(in millions)</i>	
Credit	\$ 4,387
Market	4,090
Operational	4,867
Other (a)	695
Economic capital required - consolidated	\$ 14,039
CET1	\$ 18,593
Capital cushion	\$ 4,554

(a) Includes interest rate risk, reputational risk and diversification benefit.

Global compliance

Our global compliance function provides leadership, guidance and oversight to help our businesses identify applicable laws and regulations and implement effective measures to meet the specific requirements. Compliance takes a proactive approach by anticipating evolving regulatory standards and remaining aware of industry best practices, legislative initiatives, competitive issues, and public expectations and perceptions. The function uses its global reach to disseminate information about compliance-related matters throughout BNY Mellon. The Chief Compliance and Ethics Officer reports to the Chief Risk Officer, is a member of key committees of BNY Mellon and provides regular updates to the Risk Committee of the board of directors.

Internal audit

Internal Audit is an independent, objective assurance function that reports directly to the Audit Committee of the Company's Board of Directors. It assists the Company in accomplishing its objectives by bringing a systematic, disciplined, risk-based approach to evaluate and improve the effectiveness of the Company's risk management, control and governance processes. The scope of Internal Audit's work includes the review and evaluation of the adequacy, effectiveness and sustainability of risk management procedures, internal control systems, information systems and governance processes.

Evolving Regulatory Environment

BNY Mellon engages in banking, investment advisory and other financial activities in the U.S. and 34 other countries, and is subject to extensive regulation in the jurisdictions in which it operates. Global supervisory authorities generally are charged with ensuring the safety and soundness of financial institutions, protecting the interests of customers, including depositors in banking entities and investors in mutual funds and other pooled vehicles, safeguarding the integrity of securities and other financial markets and promoting systemic resiliency and financial stability in the relevant country. They are not, however, generally charged with protecting the interests of our shareholders or non-deposit creditors. This discussion outlines the material elements of selected laws and regulations applicable to us. The impact of certain other laws and regulations, such as tax law, is discussed elsewhere in the Annual Report. Changes in these standards, or in their application, cannot be predicted, but may have a material effect on our businesses and results of operations.

The financial services industry has been the subject of enhanced regulatory oversight in the past decade globally, and this trend may continue in the future. Our businesses have been subject to a significant number of global reform measures. In particular, the Basel Committee's December 2010 final capital framework for strengthening international capital standards ("Basel III"), the Dodd-Frank Act and implementing regulations have significantly restructured the financial regulatory regime in the United States and enhanced supervision and prudential standards for large BHCs like BNY Mellon. The implications of Basel III and the Dodd-Frank Act for our businesses depend to a large extent on the manner in which implementing regulations continue to be established and interpreted by the primary U.S. financial regulatory agencies - the Federal Reserve, the FDIC, the Office of the Comptroller of the Currency ("OCC"), the SEC and the Commodity Futures Trading Commission ("CFTC"). The implications are also dependent on continuing changes in market practices and structures in response to the requirements of Basel III, the Dodd-Frank Act and financial reforms in other jurisdictions. Certain aspects of Basel III and the Dodd-Frank Act remain subject to further rulemaking, take effect over various transition periods, or contain other elements that make it

difficult to precisely anticipate their full impact. In addition, other national and global non-U.S. reform measures adopted or under consideration by various policy makers that are being considered may materially adversely impact us.

Political developments may result in legislative and regulatory changes to key aspects of the Dodd-Frank Act, its implementing regulations, and related laws. In addition, the UK referendum vote to leave the European Union and the implementation of that decision have resulted in uncertainty as to the implementation, scope and timing of regulatory reforms affecting our UK and EU operations and contingency planning for our EU operating model.

Enhanced Prudential Standards and Large Exposures

Sections 165 and 166 of the Dodd-Frank Act direct the Federal Reserve to enact heightened prudential standards and early remediation requirements applicable to BHCs with total consolidated assets of \$50 billion or more, such as BNY Mellon, and certain designated nonbank financial companies (generally referred to as "SIFIs"). The Dodd-Frank Act mandates that the requirements applicable to SIFIs be more stringent than those applicable to other financial companies.

The Federal Reserve has adopted rules ("Final SIFI Rules") to implement liquidity requirements, stress testing of capital and overall risk management requirements.

BNY Mellon must comply with enhanced liquidity and overall risk management standards, which include maintenance of a buffer of highly liquid assets based on projected funding needs for 30 days. The liquidity buffer is in addition to the U.S. banking agencies' rules regarding the LCR, discussed below, and is described by the Federal Reserve as being "complementary" to those liquidity standards.

The Final SIFI Rules do not address single-counterparty credit limits or early remediation provisions. On March 4, 2016, the Federal Reserve issued its re-proposal to limit credit exposures to single counterparties. With respect to BNY Mellon, which is a "major covered company" as defined in the re-proposal, the re-proposal prohibits having aggregate net credit exposure in excess of 15% of its Tier 1 capital to a "major counterparty," and 25% of its Tier 1 capital to any other counterparty. The

Federal Reserve's re-proposal requires securities finance transaction ("SFT") exposures to be calculated using the "collateral haircut approach" in the Standardized Approach, described below.

The Basel Committee has also developed a framework for large exposures, which is scheduled to become effective on Jan. 1, 2019. It will become binding on U.S. banking organizations only to the extent that the U.S. banking agencies implement the framework, including through the Federal Reserve's adoption of final single counterparty credit limits.

Capital Planning and Stress Testing

Payment of Dividends, Stock Repurchases and Other Capital Distributions

The Parent is a legal entity separate and distinct from its banks and other subsidiaries. Therefore, the Parent primarily relies on dividends, interest, distributions, and other payments from its subsidiaries, including extensions of credit from the IHC, to meet its obligations, including its obligations with respect to its securities, and to provide funds for share repurchases and payment of common and preferred dividends to its stockholders, to the extent declared by the board of directors. Various federal and state laws and regulations limit the amount of dividends that may be paid to the Parent by our bank subsidiaries without regulatory consent. If, in the opinion of the applicable federal regulatory agency, a depository institution under its jurisdiction is engaged in or is about to engage in an unsafe or unsound practice (which, depending on the financial condition of the bank, could include the payment of dividends), the regulator may require, after notice and hearing, that the bank cease and desist from such practice. The OCC, the Federal Reserve and the FDIC have indicated that the payment of dividends would constitute an unsafe and unsound practice if the payment would reduce a depository institution's capital to an inadequate level. Moreover, under the Federal Deposit Insurance Act, as amended (the "FDI Act"), an insured depository institution may not pay any dividends if the institution is undercapitalized or if the payment of the dividend would cause the institution to become undercapitalized. In addition, the federal bank regulatory agencies have issued policy statements which provide that FDIC-insured depository institutions and their holding companies should generally pay dividends only out of their current operating earnings.

In general, the amount of dividends that may be paid by our U.S. banking subsidiaries, including to the Parent, is limited to the lesser of the amounts calculated under a "recent earnings" test and an "undivided profits" test. Under the recent earnings test, a dividend may not be paid if the total of all dividends declared and paid by the entity in any calendar year exceeds the current year's net income combined with the retained net income of the two preceding years, unless the entity obtains prior regulatory approval. Under the undivided profits test, a dividend may not be paid in excess of the entity's "undivided profits" (generally, accumulated net profits that have not been paid out as dividends or transferred to surplus). The ability of our bank subsidiaries to pay dividends to the Parent may also be affected by the capital adequacy standards applicable to those subsidiaries, which include minimum requirements and buffers.

There are also limitations specific to the IHC's ability to make distributions or extend credit to the Parent. The IHC is not permitted to pay dividends to the Parent if certain key capital, liquidity and operational risk indicators are breached. Additionally, if our projected financial resources deteriorate so severely that resolution of the Parent becomes imminent, the committed lines of credit provided by the IHC to the Parent will automatically terminate, with all outstanding amounts becoming due.

BNY Mellon's capital distributions are subject to Federal Reserve oversight. The major component of that oversight is the Federal Reserve's CCAR, implementing its capital plan rule. That rule requires BHCs having \$50 billion or more in total consolidated assets (including BNY Mellon) to submit annual capital plans to their respective Federal Reserve Bank. We are also required to collect and report certain related data on a quarterly basis to allow the Federal Reserve to monitor progress against the annual capital plans. Generally, BNY Mellon and other affected BHCs may pay dividends, repurchase stock and make other capital distributions only in accordance with a capital plan that has been reviewed by the Federal Reserve and as to which the Federal Reserve has not objected. The Federal Reserve may object to our capital plan for quantitative or qualitative reasons, including if the plan does not show that the covered BHC will meet, for each quarter throughout the nine-quarter planning horizon covered by the capital plan, all minimum regulatory capital ratios under applicable capital rules as in

effect for that quarter on a *pro forma* basis under the base case and stressed scenarios (including a severely adverse scenario provided by the Federal Reserve). The capital plan rule also stipulates that we may not make a capital distribution unless after giving effect to the distribution it will meet all minimum regulatory capital ratios.

The purpose of CCAR is to ensure that these BHCs have robust, forward-looking capital planning processes that account for their unique risks and that permit continued operations during times of economic and financial stress. The 2018 CCAR instructions, consistent with prior Federal Reserve guidance, provide that capital plans contemplating dividend payout ratios exceeding 30% of projected after-tax net income will receive particularly close scrutiny. BNY Mellon's common stock dividend payout ratio was 23% for 2017. See "Capital" for information about our 2017 capital plan.

Regulatory Stress-Testing Requirements

In addition to the CCAR stress testing requirements, Federal Reserve regulations also include complementary Dodd-Frank Act Stress Tests ("DFAST"). The CCAR and DFAST requirements substantially overlap, and the Federal Reserve implements them at the BHC level on a coordinated basis. Under these DFAST regulations, we are required to undergo regulatory stress tests conducted by the Federal Reserve annually, and to conduct our own internal stress tests pursuant to regulatory requirements twice annually. In addition, The Bank of New York Mellon is required to conduct its own annual internal stress test (although the bank is permitted to combine certain reporting and disclosure of its stress test results with the results of BNY Mellon). These requirements involve testing of capital under various scenarios, including baseline, adverse and severely adverse scenarios provided by the appropriate banking regulator. Results from our annual company-run stress tests are reported to the appropriate regulators and published. The Federal Reserve published the results of its most recent annual 2017 DFAST stress-test on June 22, 2017. We published the results of our most recent company-run annual stress test on June 22, 2017, and the results of our company-run mid-year stress test on Oct. 23, 2017.

Capital Requirements - Generally

As a BHC, we are subject to U.S. capital rules, administered by the Federal Reserve. Our bank subsidiaries are subject to similar capital requirements administered by the Federal Reserve in the case of The Bank of New York Mellon and by the OCC in the case of our national bank subsidiaries, BNY Mellon, N.A. and The Bank of New York Mellon Trust Company, National Association. These requirements are intended to ensure that banking organizations have adequate capital given the risk levels of their assets and off-balance sheet exposures.

Notwithstanding the detailed U.S. capital rules, the federal banking agencies retain significant discretion to set higher capital requirements for categories of BHCs or banks or for an individual BHC or bank as situations warrant. The U.S. capital rules allow a graduated implementation schedule and will be substantially phased-in by 2019. BNY Mellon became subject to the SLR on Jan. 1, 2018.

U.S. Capital Rules - Minimum Risk-Based Capital Ratios and Capital Buffers

Consistent with the terms of the Basel III framework and the Dodd-Frank Act, the U.S. capital rules require Advanced Approaches banking organizations, such as BNY Mellon, to satisfy minimum risk-based capital ratios using both the U.S. capital rules' standardized approach risk-weightings framework (the "Standardized Approach") and the advanced approaches risk-weighting framework (the "Advanced Approaches"). These requirements are detailed above under "Results of Operations - Capital." In addition, these minimum ratios will be supplemented by a capital conservation buffer required threshold that began being phased in on Jan. 1, 2016, in increments of 0.625% per year until it reaches 2.5% on Jan. 1, 2019. The capital conservation buffer can only be satisfied with CET1 capital.

When systemic vulnerabilities are meaningfully above normal, the capital conservation buffer may be expanded up to an additional 2.5% through the imposition of a countercyclical capital buffer. For internationally active banks such as BNY Mellon, the countercyclical capital buffer required threshold is a weighted average of the countercyclical capital buffers deployed in each of the jurisdictions in which the bank has private sector credit exposures. The

Federal Reserve, in consultation with the OCC and FDIC, has affirmed the current countercyclical capital buffer level for U.S. exposures of 0% and noted that any future modifications to the buffer would generally be subject to a 12-month phase-in period. Any countercyclical capital buffer required threshold arising from exposures outside the United States will also generally be subject to a 12-month phase-in period.

The U.S. capital rules' buffers are also supplemented by a risk-based capital surcharge on G-SIBs (the "Final U.S. G-SIB Rule"). The final rule requires G-SIBs to calculate their surcharges under two methods (referred to as "method 1" and "method 2") and use the higher of the two surcharges. The first method is based on the Basel Committee's framework and considers a G-SIB's size, interconnectedness, cross-jurisdictional activity, substitutability and complexity. The second method uses similar inputs, but is calibrated to result in significantly higher surcharges and replaces substitutability with a measure of reliance on short-term wholesale funding. The Final U.S. G-SIB Rule does not add the G-SIB surcharge to post-stress minimum risk-based capital ratios for purposes of DFAST or CCAR. Consistent with the phase-in of the capital conservation buffer, the G-SIB capital surcharge began to be phased-in beginning on Jan. 1, 2016 and will become fully effective on Jan. 1, 2019. For 2018, the G-SIB surcharge applicable to BNY Mellon will be 1.5% on a fully phased-in basis, subject to applicable phase-ins.

U.S. Capital Rules - Deductions from and Adjustments to Capital Elements

The U.S. capital rules provide for a number of deductions from and adjustments to CET1 capital. These include, for example, providing that unrealized gains and losses on all available-for-sale debt securities may *not* be filtered out for regulatory capital purposes, and the requirement that mortgage servicing rights, deferred tax assets dependent upon future taxable income and significant investments in non-consolidated financial entities be deducted from CET1 to the extent that any one such category exceeds 10% of CET1 or all such categories in the aggregate exceed 15% of CET1.

U.S. Capital Rules - Advanced Approaches Risk-Based Capital Rules

Under the U.S. capital rules' Advanced Approaches framework, credit risk risk-weightings are generally based on risk-sensitive approaches that largely rely on the use of internal credit models and parameters, whereas under the Standardized Approach credit risk risk-weightings are generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. BNY Mellon is required to comply with Advanced Approaches reporting and public disclosures. Under the U.S. capital rules, this means, among other things, for purposes of determining whether we meet minimum risk-based capital requirements, our CET1 ratio, Tier 1 capital ratio, and total capital ratio is the lower of that calculated under the Standardized Approach and under the Advanced Approaches framework.

U.S. Capital Rules - Generally Applicable Risk-Based Capital Rules: Standardized Approach

The agencies' generally applicable risk-based capital rules (i.e., the Standardized Approach) calculate risk-weighted assets in the denominator of capital ratios using a broad array of risk weighting categories that are intended to be risk sensitive. The risk-weights for the Standardized Approach generally range from 0% to 1,250%. Higher risk-weights under the Standardized Approach apply to a variety of exposures, including certain securitization exposures, equity exposures, claims on securities firms and exposures to counterparties on OTC derivatives.

Concerning securities finance transactions, including transactions in which we serve as agent and provide securities replacement indemnification to a securities lender, the U.S. capital rules do not permit a banking organization to use a simple VaR approach to calculate exposure amounts for repo-style transactions or to use internal models to calculate the exposure amount for the counterparty credit exposure for repo-style transactions under the Standardized Approach (although these methodologies are allowed in the Advanced Approaches). Under the Standardized Approach, a banking organization may use a collateral haircut approach to recognize the credit risk mitigation benefits of financial collateral that secures a repo-style transaction, including an agent securities lending transaction, among other transactions. To apply the collateral haircut approach, a banking organization must determine the exposure

amount and the relevant risk weight for the counterparty and collateral posted.

Leverage Ratios

The U.S. capital rules require a minimum 4% leverage ratio for all banking organizations and a new 3% Basel III-based SLR for Advanced Approaches banking organizations, including BNY Mellon, which became effective Jan. 1, 2018. Unlike the Tier 1 leverage ratio, the SLR includes certain off-balance sheet exposures in the denominator, including the potential future credit exposure of derivative contracts and 10% of the notional amount of unconditionally cancelable commitments.

The U.S. G-SIBs (including BNY Mellon) and their insured depository institution subsidiaries are subject to an enhanced SLR, which requires us to maintain an SLR of greater than 5% (composed of the current minimum requirement of 3% plus a greater than 2% buffer) and requires bank subsidiaries of those BHCs to maintain at least a 6% SLR in order to qualify as “well capitalized” under the prompt corrective action regulations discussed below. The final enhanced SLR rule for U.S. G-SIBs, like the SLR more generally applicable to all Advanced Approaches banking organizations, became effective on Jan. 1, 2018. At Dec. 31, 2017, our SLR was 6.1% and the SLR for our primary banking subsidiary, The Bank of New York Mellon, was 6.9%.

BCBS Revisions to Components of Basel III

On Dec. 7, 2017 the BCBS released revisions to Basel III intended to reduce variability of RWA and improve the comparability of banks’ risk-based capital ratios. Among other measures, the final revisions: (1) establish a revised Standardized Approach for credit risk that enhances the Standardized Approach’s granularity and risk sensitivity, including using a more risk sensitive exposure measurement method for securities financing transactions; (2) adjust the internal ratings-based approaches for credit risk by removing the use of the advanced internal ratings-based approach for certain asset classes and establishing input floors for the calculation of RWA; (3) replace the advanced measurement approach for operational risk with a revised Standardized Approach for operational risk based on measures of a bank’s income and historical losses; (4) revise the leverage ratio exposure measure, establish a “leverage ratio buffer” for G-SIBs, set at

50% of a G-SIB’s risk-based capital surcharge, and allow national discretion to exclude central bank placements in limited circumstances; and (5) introduce a new 72.5% output floor based on the Standardized Approach. The revised standards are effective Jan. 1, 2022, with the output floor phasing in from 2022 to 2027.

Further, the BCBS announced that it would extend the market risk capital requirements implementation date from Jan. 1, 2019, to Jan. 1, 2022, to align with the other BCBS revisions and to give the BCBS an opportunity to review the market risk framework further. There is continuing uncertainty regarding whether and how the U.S. regulators will implement these standards.

Total Loss-Absorbing Capacity

On Dec. 15, 2016, the Federal Reserve issued a final rule (the “TLAC Rule”) establishing external total loss-absorbing capacity (“TLAC”) and related requirements for U.S. G-SIBs, including BNY Mellon, at the top-tier holding company level. The TLAC Rule will be effective on Jan. 1, 2019.

Under the TLAC Rule, U.S. G-SIBs will be required to maintain a minimum eligible external TLAC equal to the greater of (a) 18% of RWAs plus a buffer (to be met using only CET1) equal to the sum of 2.5% of RWAs, the G-SIB surcharge calculated under method 1 and any applicable countercyclical buffer; and (b) 7.5% of their total leverage exposure (the denominator of the SLR) plus a buffer (to be met using only Tier 1 Capital) equal to 2% composed solely of Tier 1 capital.

U.S. G-SIBs also will be required to maintain minimum external eligible long-term debt (“LTD”) equal to the greater of (a) 6% of RWAs plus the G-SIB surcharge (calculated using the greater of method 1 and method 2), and (b) 4.5% of total leverage exposure. In order to be deemed eligible LTD, debt instruments must, among other requirements, be unsecured, not be structured notes, be governed by U.S. law, and have a maturity of more than one year from the date of issuance. In addition, the TLAC Rule requires that LTD issued on or after Dec. 31, 2016 (i) not have acceleration rights, other than in the event of non-payment or the bankruptcy or insolvency of the issuer and (ii) be governed by U.S. law. However, debt issued by a U.S. G-SIB prior to Dec. 31, 2016 is permanently grandfathered to the extent these

securities would be ineligible only due to containing impermissible acceleration rights or being governed by foreign law.

Further, the top-tier holding companies of U.S. G-SIBs are not permitted to issue certain guarantees of subsidiary liabilities, incur liabilities guaranteed by subsidiaries, issue short-term debt to third parties, or enter into derivatives and certain other financial contracts with external counterparties. Certain liabilities are capped at 5% of the value of the U.S. G-SIB's eligible external TLAC instruments. The Federal Reserve considered requiring internal TLAC at domestic subsidiaries of U.S. G-SIBs, but has not proposed rules regarding these instruments. Foreign jurisdictions may impose internal TLAC requirements on the foreign subsidiaries of U.S. G-SIBs.

Prompt Corrective Action

The FDI Act, as amended by the Federal Deposit Insurance Corporation Improvement Act of 1991 ("FDICIA"), requires the federal banking agencies to take "prompt corrective action" in respect of depository institutions that do not meet specified capital requirements. FDICIA establishes five capital categories for FDIC-insured banks: "well capitalized," "adequately capitalized," "undercapitalized," "significantly undercapitalized," and "critically undercapitalized." The FDI Act imposes progressively more restrictive constraints on operations, management and capital distributions the less capital the institution holds. While these regulations apply only to banks, such as The Bank of New York Mellon and BNY Mellon, N.A., the Federal Reserve is authorized to take appropriate action against the parent bank holding company, such as the Parent, based on the under-capitalized status of any banking subsidiary. In certain circumstances, the Parent would be required to guarantee the performance of the capital restoration plan if one of our banking subsidiaries were undercapitalized.

The U.S. capital rules also maintain "well capitalized" thresholds for insured depository institutions under the federal banking agencies' prompt corrective action framework. Under the U.S. capital rules, an insured depository institution is deemed to be "well capitalized" if it has capital ratios as detailed above under "Results of Operations - Capital."

Effective Jan. 1, 2018, the U.S. capital rules also require an Advanced Approaches banking organization to maintain an SLR of at least 3% to qualify for the "adequately capitalized" status. In addition, as noted above, the U.S. federal banking agencies' revisions to the enhanced SLR establish a SLR "well capitalized" threshold of 6% for covered insured depository institutions, including The Bank of New York Mellon and BNY Mellon N.A.

Liquidity Standards - Basel III and U.S. Rules and Proposals

BNY Mellon is subject to the Final LCR Rule which is designed to ensure that BNY Mellon and its domestic bank subsidiaries maintain an adequate level of unencumbered HQLA equal to their expected net cash outflow for a 30-day time horizon under an acute liquidity stress scenario. As of Dec. 31, 2017, both the Parent and its domestic bank subsidiaries were in compliance with applicable LCR requirements.

The Basel Committee issued the final NSFR document in October 2014 which contemplates an additional liquidity measure, referred to as NSFR, which is designed to promote more medium- and long-term funding of the assets and activities of banking entities over a one-year time horizon.

In April 2016 and May 2016, the FDIC and the Federal Reserve, respectively, proposed an NSFR rule that would implement a quantitative long-term liquidity requirement applicable to large and internationally active banking organizations, including BNY Mellon. The proposed NSFR rule would implement a test similar to the Basel III framework's test for medium- and long-term funding of the assets and activities of banking entities over a one-year time horizon. Under the proposed rule, BNY Mellon's NSFR would be expressed as a ratio of its available stable funding to its required stable funding amount, and BNY Mellon would be required to maintain an NSFR of 1.0. BNY Mellon continues to evaluate the potential effects of this proposal on its operations. The proposed NSFR rule would have been effective Jan. 1, 2018 had it been finalized as proposed; however, final rules have not been issued.

Separately, as noted above, the Final SIFI Rules address liquidity requirements for BHCs with \$50 billion or more in total assets, including BNY Mellon. These enhanced liquidity requirements include an

independent review of liquidity risk management; establishment of cash flow projections; a contingency funding plan, and liquidity risk limits; liquidity stress testing under multiple stress scenarios and time horizons tailored to the specific products and profile of the company; and maintenance of a liquidity buffer of unencumbered highly liquid assets sufficient to meet projected net cash outflows over 30 days under a range of stress scenarios.

Volcker Rule

The Dodd-Frank Act imposed broad prohibitions and restrictions on proprietary trading and investments in or sponsorship of hedge funds and private equity funds by banking organizations and their affiliates, commonly referred to as the “Volcker Rule.”

The Volcker Rule, subject to certain exceptions, prohibits “banking entities,” including BNY Mellon, from engaging in proprietary trading and limits our sponsorship of, and investments in, private equity and hedge funds (“covered funds”), including our ability to own or provide seed capital to covered funds and the ability for a covered fund to share the same or similar name with a BNY Mellon affiliate. In addition, the Volcker Rule restricts us from engaging in certain transactions with covered funds (including, without limitation, certain U.S. funds for which BNY Mellon acts as both sponsor/manager and custodian).

The restrictions concerning proprietary trading do not contain a broad exemption for asset-liability management functions, but contain more limited exceptions for, among other things, bona fide liquidity risk management and risk-mitigating hedging activities, as well as certain classes of exempted instruments, including government securities. Ownership interests in covered funds that banking organizations organize and offer are generally limited to 3% of the total number or value of the outstanding ownership interests of any individual fund at any time more than one year after the date of its establishment, and with respect to the aggregate value of all such ownership interests in covered funds (when combined with ownership interests in covered funds held under the Volcker Rule’s ABS issuer exemption and underwriting and market-making exemption), 3% of the banking organization’s Tier 1 capital. Moreover, a banking entity relying on the Volcker Rule’s exemption for sponsoring covered funds must deduct from its Tier 1

capital the value of related ownership interests, calculated in accordance with the final rule.

The final Volcker Rule regulations also require us to develop and maintain an extensive compliance program, subject to CEO attestation, addressing proprietary trading and covered fund activities.

Derivatives

U.S., EU and APAC regulators are in the process of implementing comprehensive rules governing the supervision, structure, trading and regulation of cleared and over-the-counter derivatives markets and participants. The Dodd-Frank Act, the European regulation on OTC derivatives (European Market Infrastructure Regulation, or “EMIR”), central counterparties and trade repositories, and APAC regulations each require or impose, or are in the process of formulating, a large number of requirements in this area, not all of which are final. However, increasingly, these regulatory regimes, individually and collectively, tend to affect the way various BNY Mellon subsidiaries operate, including where and with whom they transact, and therefore any such changes may impact business models and profitability of certain BNY Mellon subsidiaries.

The U.S. prudential regulators have adopted joint final rules establishing minimum margin requirements for the uncleared swap transactions engaged in by those dealers subject to their jurisdiction (each, a “Covered Swap Entity”) with compliance requirements which began to apply in September 2016. From that point forward, variation margin requirements were phased in over a six-month period while initial margin requirements are being phased in over a four-year period. In each instance, the higher a Covered Swap Entity’s derivatives exposure, the earlier in the phase-in period it will be required to comply. In addition, the new rules require the initial margin posted to or by a Covered Swap Entity be segregated at a third-party custodian. BNY Mellon has been complying with substantial, new variation margin requirements since March 1, 2017, and expects to begin complying with the initial margin requirements in September 2019.

Money Market Fund Reforms

SEC rules (the “MMF Rules”) require institutional prime money market funds (including institutional municipal money market funds) (“MMFs”) to maintain a floating NAV based on the current market

value of the securities in their portfolios rounded to the fourth decimal place. Previously, such funds could maintain a stable NAV of \$1.00. Government MMFs and retail MMFs are exempt from these requirements and may continue to maintain a stable NAV, provided each type of fund continues to satisfy certain definitional requirements under the new rule.

The MMF Rules also provide new tools to MMFs' boards of directors to address high net redemption activity during periods of market stress. In particular, the MMF Rules allow a MMF's board of directors to impose liquidity fees or temporarily suspend redemptions if a MMF's level of weekly liquid assets falls below certain thresholds. Government MMFs are not required to adopt the liquidity fees and redemption gates provision, but they may opt to do so.

Beyond these primary reforms, the MMF Rules also expand disclosure requirements, tighten diversification requirements and impose additional stress testing requirements. The MMF Rules also introduce a new Form N-CR, which requires MMFs to disclose certain events and related matters (for example, the imposition or removal of fees or gates, the primary consideration or factors taken into account by a board of directors in its decision related to fees and gates, and portfolio security defaults).

The European Union's Money Market Funds Regulation ("MMFR") was finalized in December 2016, and is expected to apply beginning in July 2018 for new MMFs and January 2019 for existing MMFs. MMFR is a significant change for the money market fund sector in the EU. In particular, constant net asset value ("CNAV") MMFs as they currently exist will need to convert into variable net asset value ("VNAV") MMFs, low volatility net asset value ("LVNAV") MMFs or public debt CNAV MMFs. Other significant restrictions would apply, such as the need for MMFs to apply liquidity fees and redemption gates, to diversify asset portfolios, extensive valuation and reporting requirements and prohibitions on external support.

SEC Rules on Mutual Funds

On Oct. 13, 2016, the SEC adopted regulations that impose new requirements on mutual funds, exchange-traded funds and other registered investment companies. The new rules will require mutual funds (other than money market funds) to provide portfolio-

wide and position-level holdings data to the SEC on a monthly basis. This data would include the pricing of portfolio securities, information regarding repurchase and securities lending activities, and the terms of derivatives contracts. Information contained in reports for the last month of each fund's fiscal quarter would be made available to the public within 60 days of the end of the relevant quarter.

The new rules also impose liquidity risk management requirements that are intended to reduce the risk that funds will not be able to meet shareholder redemptions and to minimize the impact of redemptions on remaining shareholders. Each fund will be required to establish a liquidity risk management program; classify the investments in its portfolio into one of four liquidity categories; maintain a highly liquid investment minimum; and limit illiquid investments to 15% of net assets. The rules also permit funds to use swing pricing in certain circumstances although the SEC has delayed the effective date of these swing pricing provisions. The compliance dates for the reporting requirements depend on the applicable reporting form. Most funds will be required to comply with the liquidity risk management requirements by Dec. 1, 2018. BNY Mellon is evaluating the cost of compliance and the impact of the new regulations on its activities.

Recovery and Resolution

As required by the Dodd-Frank Act, the Federal Reserve and FDIC have jointly issued a final rule requiring certain organizations, including each BHC with consolidated assets of \$50 billion or more, such as BNY Mellon, to submit periodically to the Federal Reserve and the FDIC a plan - referred to as the 165(d) resolution plan - for its rapid and orderly resolution in the event of material financial distress or failure. In addition, the FDIC has issued a final rule that requires insured depository institutions with \$50 billion or more in total assets, such as The Bank of New York Mellon, to submit periodically to the FDIC a plan for resolution in the event of the institution's failure.

In April 2016, the FDIC and the Federal Reserve jointly determined that BNY Mellon's 2015 165(d) resolution plan was not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, the statutory standard established in the Dodd-Frank Act, and issued a joint notice of deficiencies and shortcomings regarding our plan and

the actions that must be taken to address them, which we responded to in an Oct. 1, 2016 submission.

In December 2016, the agencies jointly determined that our Oct. 1, 2016 submission adequately remedied the identified deficiencies, and in December 2017, based on their review of our 2017 resolution plan, the agencies jointly determined that our 2017 plan satisfactorily addressed the shortcomings identified in the prior plan. The agencies found no deficiencies or shortcomings in BNY Mellon's 2017 plan. A public portion of our resolution plans and our October 2016 submission are available on the Federal Reserve's and FDIC's websites.

If the Federal Reserve and FDIC jointly determine that our future submissions are not credible and the covered BHC fails to address the deficiencies in a timely manner, the FDIC and the Federal Reserve may jointly impose more stringent capital, leverage or liquidity requirements or restrictions on our growth, activities or operations. If we continue to fail to adequately remedy any deficiencies, we could be required to divest assets or operations that the regulators determine necessary to facilitate our orderly resolution.

In connection with our single point of entry resolution strategy, we have established the IHC to facilitate the provision of capital and liquidity resources to certain key subsidiaries in the event of material financial distress or failure. In the second quarter of 2017, we entered into a binding support agreement that requires the IHC to provide that support. The support agreement required the Parent to transfer its intercompany loans and most of its cash to the IHC, and requires the Parent to continue to transfer cash and other liquid financial assets to the IHC.

BNY Mellon and the other U.S. G-SIBs are subject to heightened supervisory expectations for recovery and resolution preparedness under Federal Reserve rules and guidance. These expectations relate to capabilities critical to operational resilience and contingency planning, including: effective processes for managing, identifying and valuing collateral; a comprehensive understanding of obligations and exposures associated with payment, clearing and settlement activities; the ability to analyze liquidity and funding sources, uses and risks; demonstrated management information systems capabilities on a legal entity basis; and robust arrangements for the continued provision of shared and outsourced

services. The Federal Reserve incorporates reviews of these key capabilities as part of its ongoing supervision of BNY Mellon. The European Union Bank Recovery and Resolution Directive ("BRRD") applies to various subsidiaries and branches of BNY Mellon.

BRRD provides for recovery and resolution planning and a set of harmonized powers to resolve or implement recovery of relevant institutions, including branches of non-European Economic Area ("EEA") banks operating within the EEA. BRRD includes the preparation of recovery and resolution plans, giving relevant EEA regulators powers to impose requirements on an institution before resolution actions become necessary; a set of resolution tools and powers to facilitate the resolution of failing entities, such as the power to "bail-in" the debt of an institution (including certain deposit obligations); and the power to require a firm to change its structure to remove impediments to resolvability. Certain BRRD requirements are currently subject to review, including the applicable moratoria provisions, as described below under "EU Banking Reform Package."

BRRD includes a minimum requirement for own funds, defined as regulatory capital, and eligible liabilities ("MREL") to ensure that institutions maintain enough capital capable of being written down and/or bailed-in. MREL will be set on a case-by-case basis for each institution subject to BRRD. MREL is the EU equivalent of TLAC, and is generally aligned with the FSB's TLAC proposals. In contrast with TLAC, MREL will apply to all institutions subject to BRRD (not only G-SIBs).

In addition, BRRD requires EU-domiciled credit institutions, and certain other firms, to prepare recovery plans or group recovery plans. Under BRRD, resolution authorities (rather than the institutions themselves) are responsible for drawing up resolution plans. We submitted recovery plans in respect of the following EMEA entities during 2017: The Bank of New York Mellon SA/NV and BNY Mellon Capital Markets EMEA Limited. We submitted a group recovery plan for Pershing Holdings (UK) Limited during 2017. We will submit updated recovery plans and group recovery plans during 2018 as required under applicable time frames.

The FSB also focused on cross-border resolution and measures to promote resolvability with the

publication of principles and guidance relating to internal TLAC and the continued access to financial markets for firms in resolution in 2017, as well as the initiation of consultations relating to bail-in execution and funding strategies for resolution plans.

Final Rule on Qualified Financial Contracts

On Sept. 1, 2017, the Federal Reserve adopted a final rule to require U.S. G-SIBs and the U.S. operations of foreign G-SIBs to amend their covered qualified financial contracts (“QFCs”). The FDIC adopted a substantially equivalent rule on Oct. 30, 2017 and the OCC did so on Nov. 29, 2017. QFCs generally include derivatives, repurchase agreements and securities lending arrangements, among others. The final rule includes two key requirements. First, the final rule generally requires that QFCs of G-SIBs explicitly provide that any resolution stays applicable to the exercise of default rights with respect to such QFCs and that any resolution transfers under U.S. special resolution regimes apply to such covered QFCs. Second, the final rule requires that QFCs of G-SIBs be amended to neither permit the exercise of default or cross-default rights against entities covered by the final rule based on the resolution or bankruptcy of an affiliate of such entities, nor allow for any transfer restrictions with respect to such QFCs.

The final rule allows G-SIBs to comply with the rule by amending relevant agreements (with the consent of relevant counterparties) using the International Swaps and Derivatives Association 2015 Universal Resolution Stay Protocol (the “Protocol”) or a similar protocol that accomplishes the contractual amendments required by the rule. BNY Mellon entities that engage in QFC activities covered by the Protocol have adhered to the Protocol. Compliance with the Federal Reserve’s final rule will be required on a phased-in basis beginning on Jan. 1, 2019. BNY Mellon is evaluating the impact of the new regulations on its activities.

Cybersecurity Regulation

As of March 1, 2017 the New York State Department of Financial Services (“NYSDFS”) requires financial institutions regulated by NYSDFS, including BNY Mellon, to establish a cybersecurity program, adopt a written cybersecurity policy, designate a chief information security officer, and have policies and procedures in place to ensure the security of

information systems and non-public information accessible to, or held by, third parties. The NYSDFS rule also includes a variety of other requirements to protect the confidentiality, integrity and availability of information systems, as well as the annual delivery of a certificate of compliance.

Insolvency of an Insured Depository Institution or a Bank Holding Company; Orderly Liquidation Authority

If the FDIC is appointed as conservator or receiver for an insured depository institution such as The Bank of New York Mellon or BNY Mellon National Association (“BNY Mellon, N.A.”), upon its insolvency or in certain other circumstances, the FDIC has the power to:

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

In addition, under federal law, the claims of holders of domestic deposit liabilities and certain claims for administrative expenses against an insured depository institution would be afforded a priority over other general unsecured claims against such an institution, including claims of debt holders of the institution, in the “liquidation or other resolution” of such an institution by any receiver. As a result, whether or not the FDIC ever sought to repudiate any debt obligations of The Bank of New York Mellon or BNY Mellon, N.A., the debt holders would be treated differently from, and could receive, if anything, substantially less than, the depositors of the bank.

The Dodd-Frank Act created a new resolution regime (known as the “orderly liquidation authority”) for systemically important financial companies,

including BHCs and their affiliates. Under the orderly liquidation authority, the FDIC may be appointed as receiver for the systemically important institution, and its failed nonbank subsidiaries, for purposes of liquidating the entity if, among other conditions, it is determined at the time of the institution's failure that it is in default or in danger of default and the failure poses a risk to the stability of the U.S. financial system.

If the FDIC is appointed as receiver under the orderly liquidation authority, then the powers of the receiver, and the rights and obligations of creditors and other parties who have dealt with the institution, would be determined under the Dodd-Frank Act's orderly liquidation authority provisions, and not under the insolvency law that would otherwise apply. The powers of the receiver under the orderly liquidation authority were based on the powers of the FDIC as receiver for depository institutions under the FDI Act. However, the provisions governing the rights of creditors under the orderly liquidation authority were modified in certain respects to reduce disparities with the treatment of creditors' claims under the U.S. Bankruptcy Code as compared to the treatment of those claims under the new authority. Nonetheless, substantial differences in the rights of creditors exist as between these two regimes, including the right of the FDIC to disregard the strict priority of creditor claims in some circumstances, the use of an administrative claims procedure to determine creditors' claims (as opposed to the judicial procedure utilized in bankruptcy proceedings), and the right of the FDIC to transfer assets or liabilities of the institution to a third party or a "bridge" entity.

Depositor Preference

Under U.S. federal law, claims of a receiver of an insured depository institution for administrative expenses and claims of holders of U.S. deposit liabilities (including foreign deposits that are payable in the U.S. as well as in a foreign branch of the depository institution) are afforded priority over claims of other unsecured creditors of the institution, including depositors in non-U.S. branches. As a result, such depositors could receive, if anything, substantially less than the depositors in U.S. offices of the depository institution.

Transactions with Affiliates

Transactions between BNY Mellon's banking subsidiaries, on the one hand, and the Parent and its nonbank subsidiaries and affiliates, on the other, are subject to certain restrictions, limitations and requirements, which include limits on the types and amounts of transactions (including extensions of credit and asset purchases by our banking subsidiaries) that may take place and generally require those transactions to be on arm's-length terms. In general, extensions of credit by a BNY Mellon banking subsidiary to any nonbank affiliate, including the Parent, must be secured by designated amounts of specified collateral and are limited in the aggregate to 10% of the relevant bank's capital and surplus for transactions with a single affiliate and to 20% of the relevant bank's capital and surplus for transactions with all affiliates. There are also limitations on affiliate credit exposures arising from derivative transactions and securities lending and borrowing transactions.

Deposit Insurance

Our U.S. banking subsidiaries, including The Bank of New York Mellon and BNY Mellon, N.A., accept deposits, and those deposits have the benefit of FDIC insurance up to the applicable limit. The current limit for FDIC insurance for deposit accounts is \$250,000 for each depositor account. Under the FDI Act, insurance of deposits may be terminated by the FDIC upon a finding that the insured depository institution has engaged in unsafe and unsound practices, is in an unsafe or unsound condition to continue operations or has violated any applicable law, regulation, rule, order or condition imposed by a bank's federal regulatory agency.

The FDIC's Deposit Insurance Fund (the "DIF") is funded by assessments on insured depository institutions. The FDIC assesses DIF premiums based on a bank's average consolidated total assets, less the average tangible equity of the insured depository institution during the assessment period. For larger institutions, such as The Bank of New York Mellon and BNY Mellon, N.A., assessments are determined based on CAMELS ratings and forward-looking financial measures to calculate the assessment rate, which is subject to adjustments by the FDIC, and the assessment base.

Under the FDIC's regulations, a custody bank may deduct from its assessment base 100% of cash and balances due from depository institutions, securities, federal funds sold, and securities purchased under agreement to resell with a Standardized Approach risk-weight of 0% and may deduct 50% of such asset types with a Standardized Approach risk-weight of greater than 0% and up to and including 20%. This assessment base deduction may not exceed the average value of deposits that are classified as transaction accounts and are identified by the bank as being directly linked to a fiduciary or custodial and safekeeping account.

The Dodd-Frank Act requires the DIF reserve ratio to reach a minimum of 1.35% by Sept. 30, 2020, and authorizes the FDIC to implement special assessments on insured depository institutions to reach the required ratio. All large insured depository institutions, which includes The Bank of New York Mellon and BNY Mellon, N.A., are currently subject to a 4.5 basis point annual surcharge that will end on Dec. 31, 2018, or once the DIF reserve ratio reaches 1.35%, whichever comes first. If the reserve ratio does not reach 1.35% by Dec. 31, 2018, the FDIC will impose a one-time shortfall assessment on large insured depository institutions in proportion to each such institution's average surcharge assessment base between July 1, 2016 and Dec. 31, 2018.

In the EU, deposit insurance measures have also been implemented under the 2014 Deposit Guarantee Scheme Directive. This regulation extends the scope of deposit protection in the EU to cover most corporate entities, which will require certain BNY Mellon entities to contribute additional funds to new or existing deposit protection schemes to cover these additional deposits. The contributions and required systems enhancements may result in a significant additional expense for impacted BNY Mellon entities.

Source of Strength and Liability of Commonly Controlled Depository Institutions

BHCs are required by law to act as a source of strength to their bank subsidiaries. Such support may be required by the Federal Reserve at times when we might otherwise determine not to provide it. In addition, any loans by BNY Mellon to its bank subsidiaries would be subordinate in right of payment to depositors and to certain other indebtedness of its banks. In the event of a BHC's bankruptcy, any commitment by the BHC to a federal bank regulator

to maintain the capital of a subsidiary bank will be assumed by the bankruptcy trustee and entitled to a priority of payment. In addition, in certain circumstances, BNY Mellon's insured depository institution subsidiaries could be held liable for losses incurred by another BNY Mellon insured depository institution subsidiary. In the event of impairment of the capital stock of one of BNY Mellon's national bank subsidiaries or The Bank of New York Mellon, BNY Mellon, as the banks' stockholder, could be required to pay such deficiency.

Incentive Compensation Arrangements Proposal

Section 956 of the Dodd-Frank Act requires federal regulators to prescribe regulations or guidelines regarding incentive-based compensation practices at certain financial institutions, including BNY Mellon. In April 2016, a joint proposed rule was released, replacing a previous 2011 proposal, which each of six agencies must separately approve. The timeframe for final implementation is currently unknown.

Anti-Money Laundering and the USA PATRIOT Act

A major focus of governmental policy on financial institutions has been aimed at combating money laundering and terrorist financing. The USA PATRIOT Act of 2001 contains numerous anti-money laundering requirements for financial institutions that are applicable to BNY Mellon's bank, broker-dealer and investment adviser subsidiaries and mutual funds and private investment companies advised or sponsored by our subsidiaries. Those regulations impose obligations on financial institutions to maintain a broad anti-money laundering program that includes internal controls, independent testing, compliance management personnel, training, and customer due diligence processes, as well as appropriate policies, procedures and controls to detect, prevent and report money laundering, terrorist financing and other suspicious activity, and to verify the identity of their customers. Certain of those regulations impose specific due diligence requirements on financial institutions that maintain correspondent or private banking relationships with non-U.S. financial institutions or persons.

Financial Crimes Enforcement Network ("FinCEN") Final Customer Due Diligence Rule

Effective July 11, 2016, FinCEN issued final rules under the Bank Secrecy Act to clarify and strengthen

customer due diligence (“CDD”) requirements, including a new requirement to identify and verify the identity of beneficial owners of legal entity customers. Covered financial institutions, including The Bank of New York Mellon and BNY Mellon, N.A., must comply with these rules by May 11, 2018. The rule reaffirms four pillars of an effective anti-money laundering (“AML”) program (development of internal policies, procedures and related controls; designation of a compliance officer; a thorough and ongoing training program; and independent review for compliance) and adds a fifth: CDD, wherein a covered financial institution is required to implement and maintain risk-based procedures for conducting CDD that include the identification and verification of any beneficial owner(s) of each legal entity customer at the time a new account is opened on or after May 11, 2018.

New York State Department of Financial Services (“NYSDFS”) anti-money laundering and anti-terrorism regulations

On June 30, 2016, the NYSDFS finalized its regulations requiring regulated institutions, including The Bank of New York Mellon, to maintain a transaction monitoring program to monitor transactions for potential Bank Secrecy Act (“BSA”) and AML violations and suspicious activity reporting, and a watch list filtering program to interdict transactions prohibited by applicable sanctions programs.

The final regulations require a regulated institution to maintain programs to monitor and filter transactions for potential BSA and AML violations and prevent transactions with sanctioned entities. The final regulation requires regulated institutions annually to submit a board resolution or senior officer compliance finding confirming steps taken to ascertain compliance with the regulation. The final regulation became effective Jan. 1, 2017, and the annual certification requirement begins April 15, 2018.

Privacy and Data Protection

The privacy provisions of the Gramm-Leach-Bliley Act generally prohibit financial institutions, including BNY Mellon, from disclosing nonpublic personal financial information of consumer customers to third parties for certain purposes (primarily marketing) unless customers have the opportunity to “opt out” of

the disclosure. The Fair Credit Reporting Act restricts information sharing among affiliates for marketing purposes.

In the EU, privacy law is currently regulated under the Data Protection Directive (“DPD”), implemented as a minimum standard into the domestic law of each EU member state. The DPD will be replaced in the EU by the General Data Protection Regulation (“GDPR”), which will be directly binding and applicable for each EU member state from May 25, 2018. The GDPR contains enhanced compliance obligations and increased penalties for non-compliance compared to the DPD.

Acquisitions/Transactions

Federal and state laws impose notice and approval requirements for mergers and acquisitions involving depository institutions or BHCs. The BHC Act requires the prior approval of the Federal Reserve for the direct or indirect acquisition by a BHC of more than 5% of any class of the voting shares or all or substantially all of the assets of a commercial bank, savings and loan association or BHC. In reviewing bank acquisition and merger applications, the bank regulatory authorities will consider, among other things, the competitive effect of the transaction, financial and managerial resources including the capital position of the combined organization, convenience and needs of the community factors, including the applicant’s record under the Community Reinvestment Act of 1977 (the “CRA”), the effectiveness of the subject organizations in combating money laundering activities and the risk to the stability of the U.S. banking or financial system. In addition, prior Federal Reserve approval would be required for BNY Mellon to acquire direct or indirect ownership or control of any voting shares of a company with assets of \$10 billion or more that is engaged in activities that are “financial in nature.”

Regulated Entities of BNY Mellon and Ancillary Regulatory Requirements

BNY Mellon is registered as an FHC under the Bank Holding Company Act of 1956, as amended by the Gramm-Leach-Bliley Act and by the Dodd-Frank Act (the “BHC Act”). We are subject to supervision by the Federal Reserve. In general, the BHC Act limits an FHC’s business activities to banking, managing or controlling banks, performing certain servicing activities for subsidiaries, engaging in activities

incidental to banking, and engaging in any activity, or acquiring and retaining the shares of any company engaged in any activity, that is either financial in nature or complementary to a financial activity and does not pose a substantial risk to the safety and soundness of depository institutions or the financial system generally.

A BHC's ability to maintain FHC status is dependent on: (i) its U.S. depository institution subsidiaries qualifying on an ongoing basis as "well capitalized" and "well managed" under the prompt corrective regulations of the appropriate regulatory agency (discussed above under "Prompt Corrective Action"); (ii) the BHC itself, qualifying on an ongoing basis as "well capitalized" and "well managed" under applicable Federal Reserve regulations; and (iii) its U.S. depository institution subsidiaries continuing to maintain at least a "satisfactory" rating under the CRA.

An FHC that does not continue to meet all the requirements for FHC status will, depending on which requirements it fails to meet, lose the ability to undertake new activities, or make acquisitions, that are not generally permissible for BHCs without FHC status. As of Dec. 31, 2017, BNY Mellon and our U.S. bank subsidiaries were "well capitalized" based on the ratios and rules applicable to them.

The Bank of New York Mellon, BNY Mellon's largest banking subsidiary, is a New York state-chartered bank, and a member of the Federal Reserve System and is subject to regulation, supervision and examination by the Federal Reserve, the FDIC and the NYSDFS. BNY Mellon's national bank subsidiaries, BNY Mellon, N.A. and The Bank of New York Mellon Trust Company, National Association, are chartered as national banking associations subject to primary regulation, supervision and examination by the OCC.

We operate a number of broker-dealers that engage in securities underwriting and other broker-dealer activities in the United States. These companies are SEC-registered broker-dealers and members of Financial Industry Regulatory Authority, Inc. ("FINRA"), a securities industry self-regulatory organization. BNY Mellon's nonbank subsidiaries engaged in securities-related activities are regulated by supervisory agencies in the countries in which they conduct business.

Certain of BNY Mellon's public finance and advisory activities are regulated by the Municipal Securities Rulemaking Board and are required under the SEC's Municipal Advisors Rule to register with the SEC if they provide advice to municipal entities or certain other persons on the issuance of municipal securities, or about certain investment strategies or municipal derivatives.

Certain of BNY Mellon's subsidiaries are registered with the CFTC as commodity pool operators and/or commodity trading advisors and, as such, are subject to CFTC regulation. The Bank of New York Mellon is provisionally registered as a Swap Dealer (as defined in the Dodd-Frank Act) with the CFTC, and is a member of the National Futures Association ("NFA") in that same capacity. As a Swap Dealer, The Bank of New York Mellon is subject to regulation, supervision and examination by the CFTC and NFA.

Certain of our subsidiaries are registered investment advisors under the Investment Advisers Act of 1940, as amended, and as such are supervised by the SEC. They are also subject to various U.S. federal and state laws and regulations and to the laws and regulations of any countries in which they conduct business. Our subsidiaries advise both public investment companies which are registered with the SEC under the Investment Company Act of 1940 (the "'40 Act"), including the Dreyfus family of mutual funds, and private investment companies which are not registered under the '40 Act.

Certain of our investment management, trust and custody operations provide services to employee benefit plans that are subject to the Employee Retirement Income Security Act of 1974, as amended ("ERISA"), administered by the U.S. Department of Labor ("DOL"). ERISA imposes certain statutory duties, liabilities, disclosure obligations and restrictions on fiduciaries, as applicable, related to the services being performed and fees being paid.

Department of Labor Fiduciary Rule

In 2016, the DOL issued a final rule that, among other things, expands the definition of who is designated a "fiduciary" of an employee benefit plan or individual retirement account ("IRA") under ERISA and the Internal Revenue Code, respectively, and provides certain prohibited transaction exemptions. The final rule was originally scheduled to be phased in

beginning in April 2017 and fully phased in by Jan. 1, 2018. However, on Feb. 3, 2017, President Trump issued a memorandum directing the acting Secretary of Labor to examine the rule. In response, the DOL delayed the applicability date of April 10, 2017 to June 9, 2017, and also delayed the applicability of certain restrictive conditions of the rule's prohibited transaction exemptions until Jan. 1, 2018 (the "Transition Period"). On Nov. 27, 2017 the DOL extended the Transition Period until July 1, 2019.

Operations and Regulations Outside the United States

In Europe, branches of The Bank of New York Mellon are subject to regulation in the countries in which they are established, in addition to being subject to oversight by the U.S. regulators referred to above. The Bank of New York Mellon SA/NV is a public limited liability company incorporated under the laws of Belgium. The Bank of New York Mellon SA/NV has been granted a banking license by the National Bank of Belgium ("NBB") and is authorized to carry out all banking and savings activities as a credit institution. The European Central Bank ("ECB") has responsibility for the direct supervision of significant banks and banking groups in the euro area, including The Bank of New York Mellon SA/NV. The ECB's supervision is carried out in conjunction with the relevant national prudential regulator (NBB in The Bank of New York Mellon SA/NV's case), as part of the single supervisory mechanism ("SSM"). The Bank of New York Mellon SA/NV conducts its activities in Belgium as well as through its branch offices in the UK, Ireland, Italy, Luxembourg, the Netherlands, France and Germany.

Certain of our financial services operations in the UK are subject to regulation and supervision by the Financial Conduct Authority ("FCA") and the Prudential Regulation Authority ("PRA"). The PRA is responsible for the authorization and prudential regulation of firms that carry on PRA-regulated activities, including banks. PRA-authorized firms are also subject to regulation by the FCA for conduct purposes. In contrast, FCA-authorized firms (such as investment management firms) have the FCA as their sole regulator for both prudential and conduct purposes. As a result, FCA-authorized firms must comply with FCA prudential and conduct rules and the FCA's Principles for Businesses, while dual-regulated firms must comply with the FCA conduct rules and FCA Principles, as well as the applicable

PRA prudential rules and the PRA's Principles for Businesses.

The PRA regulates The Bank of New York Mellon (International) Limited, our UK incorporated bank, as well as the UK branch of The Bank of New York Mellon. Certain of BNY Mellon's UK incorporated subsidiaries are authorized to conduct investment business in the UK. Their investment management advisory activities and their sale and marketing of retail investment products are regulated by the FCA. Certain UK investment funds, including investment funds of BNY Mellon, are registered with the FCA and are offered for sale to retail investors in the UK.

Since the financial crisis, the European Union and its Member States have engaged in a significant overhaul of bank regulation and supervision. To increase the resilience of banks and to reduce the impact of potential bank failures, new rules on capital requirements for banks and bank recovery and resolution have been adopted.

Aspects of the European Union's Banking Union have entered into force in most EU jurisdictions. The UK is not participating in the Banking Union. The key components of the Banking Union include the single resolution mechanism ("SRM") and the SSM. The SRM approach endorses the bail-in rules established in the BRRD and is described in more detail above in the section addressing Recovery and Resolution.

In addition, the Capital Requirements Directive IV ("CRD IV") and Capital Requirements Regulation ("CRR") affect BNY Mellon's EU subsidiaries by implementing Basel III and other changes, including the enhancement of the quality of capital, and the strengthening of capital requirements for counterparty credit risk, resulting in higher capital requirements. In the EU Member States, CRD IV/CRR also introduces substantive parts of the new European supervisory architecture, including the development of a single set of harmonized prudential rules for financial services. This set of rules replaces existing separately implemented rules within EU Member States, with a harmonized approach to implementation across the EU. Elements of CRD IV/CRR apply not only to BNY Mellon banking branches and subsidiaries but also to investment management and brokerage entities. CRD IV/CRR became effective on Jan. 1, 2014, with certain provisions to be phased in from 2014 to 2019.

Our Investment Management and Investment Services businesses are subject to significant regulation in numerous jurisdictions around the world relating to, among other things, the safeguarding, administration and management of client assets and client funds.

Various new, revised and/or proposed European Union directives and regulations have or will have a significant impact on our provision of many of our products and services, including the Markets in Financial Instruments Directive II and Markets in Financial Instruments Regulations (collectively, “MiFID II”), the Alternative Investment Fund Managers Directive (“AIFMD”), the Directive on Undertakings for Collective Investments in Transferable Securities (“UCITS V”), the Central Securities Depositories Regulation (“CSDR”), the regulation on OTC derivatives, central counterparties and trade repositories (commonly known as “EMIR”), the Securities Financing Transactions Regulation (“SFTR”) and the Payment Services Directive II (“PSD II”). These European Union directives and regulations may impact our operations and risk profile but may also provide new opportunities for the provision of BNY Mellon products and services. Several of these European directives and regulations are still subject to finalization by the legislature and/or substantial secondary legislation. This creates uncertainty as to business impact.

The types of activities in which the foreign branches of our banking subsidiaries and our international subsidiaries may engage are subject to various restrictions imposed by the Federal Reserve. Those foreign branches and international subsidiaries are also subject to the laws and regulatory authorities of the countries in which they operate and, in the case of banking subsidiaries, may be subject to regulatory capital requirements in the jurisdictions in which they operate.

EU Banking Reform Package

In November 2016, the European Commission published the so-called EU Banking Reform Package. This legislative package would amend CRD IV, CRR, BRRD and the Single Resolution Mechanism Regulation (“SRMR”).

The proposed amendments to CRD IV include a proposal for non-EU G-SIBs (such as BNY Mellon)

and certain other non-EU banking groups to have an “EU intermediate parent undertaking” (“EU IPU”). All EU credit institutions and certain EU investment firms in such non-EU G-SIBs/banking groups would need to fall within a corporate structure headed by the EU IPU. If this proposal is implemented in the form originally proposed by the European Commission, BNY Mellon would need to undertake significant changes in its corporate structure. Furthermore the EU IPU proposal in its original form may result in conflict with existing U.S. banking regulations that require structural separation between banking and non-banking activities.

Certain proposed amendments to BRRD relate to the powers of resolution authorities to suspend payment and delivery obligations (the “moratoria proposal”). This moratoria proposal seeks to extend the moratoria period from two business days to five working days for use both pre-resolution as well as in resolution (i.e. ten working days if used consecutively). The moratoria proposal also seeks to extend the scope of application to certain categories of deposits that are currently excluded. If such extensions to the moratoria are implemented, this may have adverse, industry-wide impacts, including for BNY Mellon’s custody services, derivatives, securities financing and margin lending businesses, as well as adverse market-wide liquidity and capital impacts.

The proposed amendments to CRR include provisions relating to the leverage ratio, NSFR, MREL (including closer alignment to the final FSB TLAC standard), a revised Basel market risk framework, counterparty credit risk, exposures to CCPs, exposures to collective investment undertakings, large exposures and reporting/disclosure requirements. The time frame in which the EU Banking Reform Package may enter into force is unclear at present.

European Commission Proposals for New Prudential Regime for EU Investment Firms

In December 2017, the European Commission published legislative proposals to establish a new prudential regime for investment firms. Under the legislative proposals, most EU investment firms would move to a separate (i.e., non-CRD IV/CRR) prudential regime that is more tailored to investment firms and harmonized across the EU. The time frame in which the new prudential regime for investment

firms may enter into force remains unclear at this stage.

European Deposit Insurance Scheme

The European Commission has proposed a European Deposit Insurance Scheme (“EDIS”) for euro area member states. Under the EDIS proposal, existing national euro area deposit guarantee schemes would transition over a number of years to a mutualized deposit guarantee scheme applicable in the euro area.

European Financial Markets and Market Infrastructure

The EU continues to develop proposals and regulations in relation to financial markets and market infrastructures. MiFID II took effect on Jan. 3, 2018, both as a directive transposed into national law and as an immediately enforceable regulation. It affects EU member states and those financial institutions conducting business in the EEA and has required significant change to comply with relevant regulatory requirements, including extensive transaction reporting and market transparency obligations and a heightened focus on how financial institutions conduct business with and disclose information to their clients. MiFID II may create new business opportunities in European markets, but requires existing business activities and processes to be reviewed more closely.

Capital Markets Union (“CMU”)

A key policy objective of the 2014-19 European Commission is to develop a Capital Markets Union (“CMU”) in the EU. Related initiatives that have already been substantially progressed include a new Prospectus Regulation and a new Securitization Regulation. The Prospectus Regulation applies from July 21, 2019 (with certain elements subject to an earlier phase in period). The Securitization

Regulation applies to securitization transactions from Jan. 1, 2019.

A number of CMU related priorities remain to be addressed during 2018 and 2019. The European Commission proposes to enhance the powers of the European Supervisory Agencies (“ESAs”), including the European Banking Authority (“EBA”), the European Securities and Markets Authority (“ESMA”) and the European Insurance and Occupational Pensions Authority (“EIOPA”). In addition, the European Commission wishes to enhance cross-border funds distribution and to promote sustainable finance.

Investment Services and Investment Management in the European Union

The AIFMD has a direct effect on our alternative fund manager clients and our depository business and other products offered across Europe. AIFMD imposes heightened obligations upon depositories, which have operational effects.

Our businesses servicing regulated funds in Europe are also affected by the revised directive governing undertakings for collective investment in transferable securities, known as UCITS V.

In July 2017, ESMA published an *Opinion on Asset Segregation* under AIFMD and UCITS V. Among other things, the opinion recognizes the use of omnibus account structures when accounting for assets in a chain of custody. This opinion is a significant development for the tri-party collateral management and securities lending businesses, given the frequent changes of beneficial ownership which such omnibus account structures support.

AIFMD and UCITS V legislation is expected to be reviewed by the European Commission during 2018.

Making or continuing an investment in securities issued by us involves certain risks that you should carefully consider. The following discussion sets forth the most significant risk factors that could affect our business, financial condition or results of operations. Some of these risks are interrelated and the occurrence of one may exacerbate the effect of others. However, factors other than those discussed below or in other of our reports filed with or furnished to the SEC also could adversely affect our business, financial condition or results of operations. We cannot assure you that the risk factors described below or elsewhere in our reports address all potential risks that we may face. These risk factors also serve to describe factors which may cause our results to differ materially from those described in forward-looking statements included herein or in other documents or statements that make reference to this Annual Report. See “Forward-looking Statements.”

Operational Risk

A communications or technology disruption or failure that results in a loss of information or impacts our ability to provide services to our clients may materially adversely affect our business, financial condition and results of operations.

We use communications and information systems to conduct our business. Our businesses are highly dependent on our ability to process large volumes of data that require global capabilities and scale from our technology platforms. If our technology or communications fail, or those of our service providers or industry utilities, we could experience, and have in the past experienced, production and system outages or failures. Any such outage or failure could adversely affect our ability to effect transactions or service our clients, which could expose us to liability for damages, result in the loss of business, damage our reputation, subject us to regulatory scrutiny or sanctions or expose us to litigation, any of which could have a material adverse effect on our business, financial condition and results of operations. Security or technology disruptions or failures that impact our communications or information systems, could affect our ability to provide services to our clients.

Upgrading our computer systems, software and networks may also subject us to disruptions or failures due to the complexity and interconnectedness of our systems, software and networks. The failure to upgrade or maintain these computer systems,

software and networks could result in ongoing attacks, unauthorized access and misuse. There can be no assurance that any such failures or interruptions will not occur or, if they do occur, that they will be adequately addressed. We may be required to expend significant additional resources to modify, investigate or remediate vulnerabilities or other exposures arising from information systems’ security risks. Due to the evolving connectivity among financial institutions, a disruptive event or failure experienced by one party could disrupt the functioning of the overall financial system.

Third parties with which we do business or that facilitate our business activities, including exchanges, clearing houses, financial intermediaries or vendors that provide services or security solutions for our operations, could also be sources of technology risk to us, including from breakdowns or failures of their own systems or capacity constraints or other services that impair our ability to process transactions and communicate with customers and counterparties. In addition, we are exposed to the risk that a technology disruption or other information security event at a common vendor to our third-party service providers could impede their ability to provide products or services to us. We may not be able to effectively monitor or mitigate operational risks relating to the use of common vendors by third-party service providers.

As our business areas evolve, whether due to the introduction of technology, new service offering requirements for our clients, or changes in regulation relative to these service offerings, unforeseen risks materially impacting our business operations could arise. The technology used can become increasingly complex and rely on the continued effectiveness of the programming code and integrity of the inputted data. Rapid technological changes and competitive pressures require us to make significant and ongoing investments in technology not only to develop competitive new products and services or adopt new technologies, but to sustain our current businesses. Our financial performance depends in part on our ability to develop and market these new products and services in a timely manner at a competitive price and adopt or develop new technologies that differentiate our products or provide cost efficiencies. The failure to ensure adequate review and consideration of critical business changes prior to and during introduction and deployment of key technological systems or failure to adequately align evolving client

commitments and expectations with operational capabilities, may adversely impact our ability to service and retain customers and could have a negative impact on our operations. The costs we incur in enhancing our technology could be substantial and may not ultimately improve our competitiveness or profitability. We maintain controls designed to reduce the risk of the unsuccessful implementation of our models, systems or processes, but such risk cannot be completely eliminated. Any technology or communications failure could, among other things, adversely affect our ability to effect transactions, service our clients, manage our exposure to risk or expand our businesses. While we continue to improve and invest in the resiliency of our technology systems, there can be no guarantee that a technology outage will not occur. For a discussion of operational risk, see “Risk Management - Operational Risk” and “Business Continuity.”

As a result of financial entities, central agents, clearing agents and houses, exchanges and technology systems across the globe becoming more interdependent and complex, a technology failure that significantly degrades, deletes or compromises the systems or data of one or more financial entities or suppliers could have a material impact on counterparties or other market participants, including us.

We rely on a variety of measures to protect our intellectual property and proprietary information, including copyrights, trademarks, patents and controls on access and distribution. These measures may not prevent misappropriation or infringement of our intellectual property or proprietary information and a resulting loss of competitive advantage. Furthermore, if a third party were to assert a claim of infringement or misappropriation of its proprietary rights, obtained through patents or otherwise, against us, we could be required to spend significant amounts to defend such claims, develop alternative methods of operations, pay substantial money damages, obtain a license from the third party or possibly stop providing one or more products or services.

A cybersecurity incident, or a failure to protect our computer systems, networks and information and our clients’ information against cybersecurity threats, could result in a loss of information, adversely impact our ability to conduct our

businesses, and damage our reputation and cause losses.

Our businesses rely heavily on technology, and are vulnerable to cybersecurity threats and disruptions that are occurring globally with greater frequency. We regularly experience cybersecurity incidents, which can include, among other things, hacker attacks, computer viruses or other malicious software, denial of service efforts, limited unavailability of service, phishing attacks and unauthorized access attempts. While we deploy a broad range of sophisticated defenses, it is possible we could suffer a material adverse impact or disruption. The security of our computer systems, software and networks, and those functions that we may outsource, may continue to be subjected to cybersecurity threats that could result in material failures or disruptions in our business.

Cybersecurity incidents may occur through intentional or unintentional acts by individuals or groups having authorized or unauthorized access to our systems or our clients’ or counterparties’ information, which may include confidential information. These individuals or groups include employees, vendors and customers, as well as hackers. Third parties may also attempt to place individuals within BNY Mellon or fraudulently induce employees, vendors, customers or other users of our systems to disclose sensitive information in order to gain access to our data or that of our clients. A cybersecurity incident that results in the loss of information may require us to reconstruct lost data, reimburse clients for data and credit monitoring services, result in loss of customer business, or damage to our computers or systems and those of our customers and counterparties. These impacts could be costly and time-consuming and materially negatively impact our business operations, financial condition and reputation.

Despite our efforts to ensure the integrity of our systems and information, it is possible that we may not be able to anticipate or to implement effective preventive measures against all cybersecurity threats, or detect all such threats, especially because the techniques used change frequently or are not recognized until after they are launched, and because attacks can originate from a wide variety of sources, including outside third parties who are involved with organized crime or who may be linked to terrorist organizations or hostile foreign governments.

The failure to maintain an adequate technology infrastructure with effective cybersecurity controls relative to the type, size and complexity of operations, markets and products traded, access to trading venues and our market interconnectedness could impact operations and impede our productivity and growth, which could cause our earnings to decline or could impact our ability to comply with regulatory obligations leading to regulatory fines and sanctions.

Our business may be materially adversely affected by operational risk.

Given the global nature of our businesses, which includes our critical role in the clearance of U.S. government securities, tri-party repo and securities lending, we are required to accurately process large numbers of transactions each day on a timely basis. The transactions we process or execute are operationally complex and can involve numerous parties, jurisdictions, regulations and systems, and as such, are subject to execution and processing errors and failures. As our businesses evolve to even more complex and voluminous transactions, at ever increasing speeds, we must also evolve our processes, controls, workforce and technology, to accurately and timely execute those transactions, which may result in an increased risk of error. When errors do occur, they may be difficult to detect and fix in a timely manner.

As a result, operational errors could materially negatively impact our ability to conduct our business or service our clients, which could adversely affect our results of operations due to potentially higher expenses and lower revenues, could lower our capital ratios, create liability for us or our clients or negatively impact our reputation. Recurring operational issues may raise concerns among regulators regarding our governance and control environment and culture.

Affiliates or third parties with which we do business or that facilitate our business activities, could also be sources of execution and processing errors and failures. In certain jurisdictions we may be deemed to be statutorily liable for operational errors, fraud or breakdowns by these affiliates or third parties. Additionally, as a result of recent regulations, including the Alternative Investment Fund Managers Directive and the Undertakings for Collective Investment in Transferable Securities V, where, in the European Economic Area we act as depositary, the

Company could be exposed to restitution risk for, among other things, errors or fraud perpetrated by a sub-custodian resulting in a loss or delay in return of client's securities. Where we are not acting as a European Economic Area depositary, but where we provide custody services to a European Economic Area depositary, we may accept similar liabilities to that depositary as a matter of contract.

Failure to satisfy regulatory standards, including "well capitalized" and "well managed" status or capital adequacy and liquidity rules more generally, could result in limitations on our activities and adversely affect our business and financial condition.

Under U.S. and international regulatory capital adequacy rules and other regulatory requirements, BNY Mellon and our subsidiary banks must meet thresholds that include quantitative measures of assets, liabilities and certain off-balance sheet items, subject to qualitative judgments by regulators about components, risk weightings and other factors. As discussed in "Supervision and Regulation," BNY Mellon is registered with the Federal Reserve as a BHC and an FHC. An FHC's ability to maintain its status as an FHC is dependent upon a number of factors, including its U.S. bank subsidiaries' qualifying on an ongoing basis as "well capitalized" and "well managed" under the banking agencies' prompt corrective action regulations as well as applicable Federal Reserve regulations. Failure by an FHC or one of its U.S. bank subsidiaries to qualify as "well capitalized" and "well managed", if unremedied over a period of time, would cause it to lose its status as an FHC and could affect the confidence of clients in it, compromising its competitive position. Additionally, an FHC that does not continue to meet all the requirements for FHC status could lose the ability to undertake new activities or make acquisitions that are not generally permissible for BHCs without FHC status or to continue such activities.

Our U.S. bank subsidiaries are also subject to regulatory capital requirements and the failure by one of our bank subsidiaries to maintain its status as "well capitalized" could lead to, among other things, higher FDIC assessments and could have reputational and associated business consequences. Moreover, the occurrence of a more significant decline in regulatory ratios by BNY Mellon or one of our U.S. bank subsidiaries or failure of one of our U.S. bank

subsidiaries to maintain status as “adequately capitalized” would lead to regulatory sanctions and limitations and could lead the federal banking agencies to take “prompt corrective action.”

If we or our subsidiary banks fail to meet U.S. and international minimum capital rules and other regulatory requirements, we may not be able to deploy capital in the operation of our business or distribute capital to stockholders, which may adversely affect our business. If we are not able to meet the additional, more stringent, capital adequacy standards that were recently promulgated, we may not remain “well capitalized.” See “Supervision and Regulation,” “Liquidity and dividends” and “Capital - Capital adequacy.”

BNY Mellon and its domestic subsidiary banks must maintain an LCR at least equal to 100% to satisfy regulatory minimums. Failure to comply with the LCR requirements may result in supervisory or enforcement actions.

Failure to meet any current or future capital or liquidity requirements, including those imposed by the U.S. capital rules, the LCR, or by regulators in implementing other portions of the Basel III framework, could materially adversely affect our financial condition. The current regulatory environment is fluid as requirements are introduced and amended. See “Supervision and Regulation.” Compliance with U.S. and international regulatory capital and liquidity requirements may impact our ability to return capital to shareholders and may impact our operations by requiring us to liquidate assets, increase borrowings, issue additional equity or other securities, or cease or alter certain operations, which may adversely affect our results of operations.

Although we expect to continue to satisfy our regulatory capital and liquidity requirements, there can be no assurances that we will not need to hold significantly more regulatory capital and liquid assets than we currently estimate in order to satisfy applicable standards. An inability to meet regulatory expectations regarding these matters may also negatively impact the assessment of BNY Mellon and its U.S. banking subsidiaries by U.S. banking regulators and our ability to make capital distributions.

Finally, our estimated regulatory capital ratios, liquidity metrics, and related components are based

on our current interpretation, expectations and understanding of the applicable rules and are subject to, among other things, ongoing regulatory review, regulatory approval of certain statistical models, additional refinements, modifications or enhancements (whether required or otherwise) to our models, and further implementation guidance. Any modifications resulting from these ongoing reviews or the continued implementation of the U.S. capital rules, the LCR, the resolution planning process, and related amendments could result in changes in our risk-weighted assets, capital components, liquidity inflows and outflows, HQLA, or other elements involved in the calculation of these measures, which could impact these ratios. Further, because operational risk is currently measured based not only upon our historical operational loss experience but also upon ongoing events in the banking industry generally, our level of operational risk-weighted assets could significantly increase or otherwise remain elevated and may potentially be subject to significant volatility, negatively impacting our capital and liquidity ratios. The uncertainty caused by these factors could ultimately impact our ability to meet our goals, supervisory requirements, and regulatory standards.

We are subject to extensive government rulemaking, regulation and supervision. These rules and regulations have, and in the future may, compel us to change how we manage our businesses, which could have a material adverse effect on our business, financial condition and results of operations. In addition, these rules and regulations have increased our compliance and operational risk and costs.

As a large, internationally active financial services company, we operate in a highly regulated environment, and are subject to a comprehensive statutory and regulatory regime, including oversight by governmental agencies both inside and outside the U.S. Regulations and related regulatory guidance and supervisory oversight impact how we analyze certain business opportunities, our regulatory capital and liquidity requirements, the revenue profile of certain of our core activities and the products and services we provide. Any changes to the regulatory frameworks and environment in which we operate and the significant management attention and resources necessary to address those changes could materially adversely affect our business, financial

condition and results of operations and have other negative consequences.

The evolving regulatory environment and uncertainty about the timing and scope of future regulations may contribute to decisions we may make to suspend, reduce or withdraw from existing businesses, activities or initiatives, which may result in potential lost revenue or significant restructuring or related costs or exposures.

The monetary, tax and other policies of various governments, agencies and regulatory authorities both in the U.S. and globally have a significant impact on interest rates, currencies, commodity pricing (including oil) and overall financial market performance, which can impact our business and results of operations. Changes in these policies are beyond our control and can be difficult to predict and we cannot determine the ultimate effect that any such changes would have upon our business, financial condition or results of operations.

Basel III and the Dodd-Frank Act have had a significant impact on the regulatory structure of the global financial markets and have imposed significant operational, compliance and risk management costs both in the near-term, as we develop and integrate appropriate systems and procedures, and on a recurring basis thereafter, as we monitor, support and refine those systems and procedures. While U.S. regulators have finalized many regulations to implement various provisions of the Dodd-Frank Act and Basel III, additional regulations or modifications to existing regulations are expected to continue to occur. In addition, there is uncertainty about the timing and scope of any changes to Basel III and the Dodd-Frank Act and other regulations adopted since the financial crisis, as well as the cost of complying with any new regulatory regimes. The full impact of these standards on us, our business strategies and financial performance is not known at this time, may not be known for a number of years and could materially adversely impact us.

The regulatory and supervisory focus of U.S. banking agencies is primarily intended to protect the safety and soundness of the banking system and federally insured deposits, and not to protect investors in our securities. Moreover, the regulatory and supervisory standards and expectations in one jurisdiction may not conform to standards or expectations in other jurisdictions. Even within a particular jurisdiction,

the standards and expectations of multiple supervisory agencies exercising authority over our affairs may not be fully harmonized. Additionally, banking regulators have wide supervisory discretion in the ongoing examination and enforcement of applicable banking statutes, regulations, and guidelines, and may restrict our ability to engage in certain activities or acquisitions, or may require us to maintain more capital or highly liquid assets.

The U.S. capital rules subject us and our U.S. banking subsidiaries to more stringent capital requirements, which could restrict growth, activities or operations, trigger divestiture of assets or operations or limit our ability to return capital to shareholders. We must also separately obtain final approval from the agencies for the use of certain models used to calculate risk-weighted assets under the Advanced Approach. In addition, our operational loss risk projections are informed by certain external losses, including certain fines and penalties levied against other institutions in the financial services industry, particularly those that relate to businesses in which we operate, and as a result such external losses could impact the amount of capital that we are required to hold.

Failure to meet current or future capital requirements, either at the end of each fiscal quarter or under hypothetical stressed conditions during the annual CCAR exercise, could materially adversely affect our financial condition. Additional impacts relating to compliance with these rules could include, but are not limited to, potential dilution of existing shareholders and competitive disadvantage compared to financial institutions not under the same regulatory framework. In addition, the SLR subjects us to a more stringent leverage requirement, which could restrict growth, activities, operations or could result in certain restrictions on capital distributions and discretionary bonus payments.

The LCR requires us to maintain significant holdings of high quality and potentially lower-yielding liquid assets. In calculating the LCR, we must also determine which deposits should be considered to be stable deposits. Stable deposits must meet a series of requirements and typically receive favorable outflow treatment under the LCR. BNY Mellon uses qualitative and quantitative analysis to identify core stable deposits. It is possible that our LCR could fall below 100% as a consequence of the inherent uncertainties associated with this analysis (including

as a result of additional guidance from our regulators). In addition to facing potential regulatory consequences (which could be significant), we may be required to remedy this shortfall by liquidating assets in our investment portfolio or raising additional debt, each of which could materially negatively impact our net interest revenue.

If the final rule regarding the NSFR is ultimately implemented in the U.S., those requirements could also require BNY Mellon to further increase its holdings of high quality, and potentially lower-yielding, liquid assets, and to reevaluate the composition of its liabilities structure to include more longer-dated debt.

Our global activities are also subject to extensive regulation by various non-U.S. regulators, including governments, securities exchanges, central banks and other regulatory bodies in the jurisdictions in which we operate, relating to, among other things, the safeguarding, administration and management of client assets and client funds. In some jurisdictions, the laws and regulations applicable to the financial services industry and post-crisis regulatory reform continue to evolve. Further the regulatory and supervisory standards and expectations across jurisdictions may be divergent and otherwise may not conform and/or may be applied in a manner that is not harmonized within a jurisdiction (in relation to national versus non-national financial services providers) and/or across jurisdictions.

In common with their U.S. counterparts, international policy makers and regulators have also increased their focus on financial services providers and our global activities are, and will continue to be, directly affected by changes to the regulatory environment. Various new, revised and proposed European Union directives and regulations have an impact on our provision of many of our products and services. Implementation of, and revisions to, these directives and regulations has affected our operations and risk profile, including the Capital Requirements Directive/Regulation, the Bank Recovery and Resolution Directive, the Deposit Guarantee Scheme Directive, the Markets in Financial Instruments Directive II/Regulation, the Alternative Investment Fund Managers Directive, the Directive on Undertakings for Collective Investments in Transferable Securities and the Payment Services Directive.

In addition, we are subject in our global operations to rules and regulations relating to corrupt and illegal payments and money laundering, economic sanctions and embargo programs administered by the U.S. Office of Foreign Assets Control and similar bodies and governmental agencies worldwide, and laws relating to doing business with certain individuals, groups and countries, such as the U.S. Foreign Corrupt Practices Act, the USA PATRIOT Act, the Iran Threat Reduction and Syria Human Rights Act of 2012 and the UK Bribery Act. While we have invested and continue to invest significant resources in training and in compliance monitoring, the geographical diversity of our operations, employees, clients and customers, as well as the vendors and other third parties that we deal with, presents the risk that we may be found in violation of such rules, regulations or laws and any such violation could subject us to significant penalties or adversely affect our reputation. In addition, such rules could impact our ability to engage in business with certain individuals, entities, groups and countries, which could materially adversely affect certain of our businesses and results of operations.

Failure to comply with laws, regulations or policies applicable to our business could result in sanctions by regulatory or governmental authorities, civil money penalties and reputational damage, which could have a material adverse effect on our business, financial condition and results of operations. If violations do occur, they could damage our reputation, increase our legal and compliance costs, and ultimately adversely impact our results of operations. Laws, regulations or policies currently affecting us and our subsidiaries, or regulatory and governmental authorities' interpretation of these statutes and regulations may change at any time, which may adversely impact our business and results of operations.

See "Supervision and Regulation" for additional information regarding the potential impact of the regulatory environment on our business.

Our risk management framework may not be effective in mitigating risk and reducing the potential for losses.

Our risk management framework seeks to mitigate risk and loss to us. We have established comprehensive policies and procedures and an internal control framework designed to provide a sound operational environment for the types of risk to

which we are subject, including operational risk, credit risk, market risk, liquidity risk and strategic risk. We have also established frameworks to mitigate risk and loss to us as a result of the actions of affiliates or third parties with which we do business or that facilitate our business activities. However, as with any risk management framework, there are inherent limitations to our current and future risk management strategies, including risks that we have not appropriately anticipated or identified.

Our regulators remain focused on ensuring that financial institutions build and maintain robust risk management policies. If our regulators perceive the quality of our risk models and framework to be insufficient, it may negatively impact our regulators' evaluations of our capital plans and stress tests. Accurate and timely enterprise-wide risk information is necessary to enhance management's decision-making in times of crisis. If our risk management framework proves ineffective or if our enterprise-wide management information is incomplete or inaccurate, we could suffer unexpected losses, which could materially adversely affect our results of operations or financial condition.

In certain instances, we rely on models to measure, monitor and predict risks. However, these models are inherently limited because they involve techniques, including the use of historical data, trends and assumptions, and judgments that cannot anticipate every economic and financial outcome in the markets in which we operate, nor can they anticipate the specifics and timing of such outcomes, especially during severe market downturns or stress events. These models may not appropriately capture all relevant risks or accurately predict future events or exposures. The models that we use to assess and control our market risk exposures also reflect assumptions about the degree of correlation among prices of various asset classes or other market indicators. The 2008 financial crisis and resulting regulatory reform highlighted both the importance and some of the limitations of managing unanticipated risks. In times of market stress or other unforeseen circumstances, previously uncorrelated indicators may become correlated, or previously correlated indicators may move in different directions. These types of market movements have at times limited the effectiveness of our hedging strategies and have caused us to incur significant losses, and they may do so in the future.

In addition, our businesses and the markets in which we operate are continuously evolving. We may fail to fully understand the implications of changes in our businesses or the financial markets or fail to adequately or timely enhance our risk framework to address those changes. If our risk framework is ineffective, either because it fails to keep pace with changes in the financial markets, regulatory requirements, our businesses, our counterparties, clients or service providers or for other reasons, we could incur losses, suffer reputational damage or find ourselves out of compliance with applicable regulatory or contractual mandates or expectations.

An important aspect of our risk management framework is creating a risk culture in which all employees fully understand that there is risk in every aspect of our business and the importance of managing risk as it relates to their job functions. We continue to enhance our risk management program to support our risk culture, ensuring that it is sustainable and appropriate to our role as a major financial institution. Nonetheless, if we fail to create the appropriate environment that sensitizes all of our employees to managing risk, our business could be adversely impacted. For more information on how we monitor and manage our risk management framework, see "Risk Management - Risk management overview."

A failure or circumvention of our controls and procedures could have a material adverse effect on our business, reputation, results of operations and financial condition.

Management regularly reviews and updates our internal controls, disclosure controls and procedures, and corporate governance policies and procedures. Any system of controls, however well designed and operated, is based in part on certain assumptions and can provide only reasonable, not absolute, assurances that the objectives of the system will be met. Any failure or circumvention of our controls and procedures or failure to comply with regulations related to controls and procedures could have a material adverse effect on our business, reputation, results of operations and financial condition. If we identify material weaknesses in our internal control over financial reporting or are otherwise required to restate our financial statements, we could be required to implement expensive and time-consuming remedial measures and could lose investor confidence in the accuracy and completeness of our financial

reports. In addition, there are risks that individuals, either employees or contractors, may circumvent established control mechanisms in order to, for example, exceed exposure, liquidity, trading or investment management limitations, or commit fraud.

If our resolution plan is determined not to be credible or not to facilitate an orderly resolution under the U.S. Bankruptcy Code, our business, reputation, results of operations and financial condition could be materially negatively impacted. The application of our Title I preferred resolution strategy or resolution under the Title II orderly liquidation authority could adversely affect our liquidity and financial condition and our security holders.

Large BHCs must develop and submit to the Federal Reserve and the FDIC for review plans for their rapid and orderly resolution in the event of material financial distress or failure. BNY Mellon and The Bank of New York Mellon each file periodic complementary resolution plans. If the agencies determine that our future submissions are not credible or would not facilitate an orderly resolution under the U.S. Bankruptcy Code, and we fail to address the deficiencies in a timely manner, the agencies may jointly impose more stringent capital, leverage or liquidity requirements or restrictions on our growth, activities or operations. If we continue to fail to adequately remedy any deficiencies identified in future submissions, we could be required to divest assets or operations that the agencies determine necessary to facilitate our orderly resolution.

In the second quarter of 2017, in connection with our single point of entry resolution strategy under Title I of the Dodd-Frank Act, the Parent entered into a binding support agreement with certain key subsidiaries to facilitate the provision of capital and liquidity resources to them in the event of material financial distress or failure. Pursuant to the support agreement, the Parent transferred its intercompany receivables and most of its cash to the IHC and will continue to transfer cash and other liquid financial assets to the IHC, subject to certain amounts retained by the Parent to meet its near-term cash needs. In connection with the initial transfer, the IHC issued unsecured subordinated funding notes to the Parent and has provided the Parent with a committed line of credit for the Parent to service its near-term obligations. The support agreement requires the Parent to transfer significant excess liquid financial

assets to the IHC on an ongoing basis, which heightens the Parent's dependence on the IHC and its other subsidiaries for its funding needs. The Parent's and the IHC's obligations under the support agreement are secured.

If our projected liquidity resources deteriorate so severely that resolution of the Parent becomes imminent, the committed line of credit the IHC provided to the Parent will automatically terminate, with all amounts outstanding becoming due and payable, and the support agreement will require the Parent to transfer most of its remaining assets (other than stock in subsidiaries and a cash reserve to fund bankruptcy expenses) to the IHC. As a result, during a period of severe financial stress the Parent could become unable to meet its debt and payment obligations (including with respect to its securities), causing the Parent to seek protection under bankruptcy laws earlier than it otherwise would have.

If the Parent were to become subject to a bankruptcy proceeding and our single point of entry strategy is successful, our material entities will not be subject to insolvency proceedings and their creditors would not be expected to suffer losses, while the Parent's security holders, including unsecured debt holders, could face significant losses, potentially including the loss of their entire investment. In the event any of our material entities were to become subject to an insolvency proceeding while the Parent is in resolution (or its resolution is imminent), unsecured creditors of our material entities would receive recoveries on their claims enjoying relative priority over the unsecured claims of the creditors of the Parent, including investors in its debt securities, relative to the assets of the Parent, IHC and the particular material entity. The single point of entry strategy - in which the Parent would be the only legal entity to enter resolution proceedings - is designed to result in greater risk of loss to holders of our unsecured senior debt securities and other securities than would be the case under a different resolution strategy.

Further, if the single point of entry strategy is not successful, our liquidity and financial condition would be adversely affected and our security holders may, as a consequence, be in a worse position than if the strategy had not been implemented.

In addition, Title II of the Dodd-Frank Act established an orderly liquidation process in the event of the

failure of a large systemically important financial institution, such as BNY Mellon, in order to avoid or mitigate serious adverse effects on the U.S. financial system. Specifically, when a U.S. G-SIB, such as BNY Mellon is in default or danger of default, and certain specified conditions are met, the FDIC may be appointed receiver under the orderly liquidation authority, and BNY Mellon would be resolved under that authority instead of the U.S. Bankruptcy Code.

U.S. supervisors have indicated that a single point of entry strategy may be a desirable strategy to resolve a large financial institution such as BNY Mellon under Title II in a manner that would, similar to our preferred strategy under our Title I resolution plan, impose losses on shareholders, unsecured debt holders and other unsecured creditors of the top-tier holding company (in our case, the Parent), while permitting the holding company's subsidiaries to continue to operate and remain solvent. Under such a strategy, assuming the Parent entered resolution proceedings and its subsidiaries remained solvent, losses at the subsidiary level could be transferred to the Parent and ultimately borne by the Parent's security holders (including holders of the Parent's unsecured debt securities), while third-party creditors of the Parent's subsidiaries would receive full recoveries on their claims. Accordingly, the Parent's security holders (including holders of unsecured debt securities and other unsecured creditors) could face losses in excess of what otherwise would have been the case.

Regulatory or enforcement actions or litigation could materially adversely affect our results of operations or harm our businesses or reputation.

Like many major financial institutions, we and our affiliates are the subject of inquiries, investigations, lawsuits and proceedings by counterparties, clients, other third parties and regulatory and other governmental agencies in the U.S. and abroad, as well as the Department of Justice (the "DOJ") and state attorneys general. See "Legal proceedings" in Note 20 of the Notes to Consolidated Financial Statements for a discussion of material legal and regulatory proceedings in which we are involved. The number of these investigations and proceedings, as well as the amount of penalties and fines sought, has remained elevated for many firms in the financial services industry, including us. We may become subject to heightened regulatory scrutiny, inquiries or investigations, and potentially client-related inquiries

or claims, relating to broad, industry-wide concerns that could lead to increased expenses or reputational damage. The current trend of large settlements by financial institutions with governmental entities may adversely affect the outcomes for other financial institutions in similar actions, especially where governmental officials have announced that the large settlements will be used as the basis or a template for other settlements. Separately, policy makers in the European Union continue to focus on protection of client assets.

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

The complexity of the federal and state regulatory and enforcement regimes in the U.S., coupled with the global scope of our operations and the increased aggressiveness of the regulatory environment worldwide, also means that a single event 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. Responding to inquiries, investigations, lawsuits and proceedings, regardless of the ultimate outcome of the matter, is time-consuming and expensive and can divert the attention of our senior management from our business. The outcome of such proceedings may be difficult to predict or estimate until late in the proceedings, which may last a number of years.

Certain of our subsidiaries are subject to periodic examination, special inquiries and potential proceedings by regulatory authorities. If compliance failures or other violations are found during an examination, inquiry or proceeding, a regulatory agency could initiate actions and impose sanctions for violations, including, for example, regulatory agreements, cease and desist orders, civil monetary penalties or termination of a license and could lead to

litigation by investors or clients, any of which could cause our earnings to decline.

Our businesses involve the risk that clients or others may sue us, claiming that we or third parties for whom they say we are responsible have failed to perform under a contract or otherwise failed to carry out a duty perceived to be owed to them, including perceived fiduciary or contractual duties. This risk may be heightened during periods when credit, equity or other financial markets are deteriorating in value or are particularly volatile, or when clients or investors are experiencing losses. As a publicly held company, we are also subject to the risk of claims under the federal securities laws. Volatility in our stock price increases this risk.

Actions brought against us may result in lawsuits, enforcement actions, injunctions, settlements, damages, fines or penalties, which could have a material adverse effect on our financial condition or results of operations or require changes to our business. Claims for significant monetary damages are asserted in many of these legal actions, while claims for disgorgement, penalties and/or other remedial sanctions may be sought in regulatory matters. Although we establish accruals for our litigation and regulatory matters in accordance with applicable accounting guidance when those matters proceed to a stage where they present loss contingencies that are both probable and reasonably estimable, nonetheless there may be a possible material exposure to loss in excess of any amounts accrued, or in excess of any loss contingencies disclosed as reasonably possible. Such loss contingencies may not be probable and reasonably estimable until the proceedings have progressed significantly, which could take several years and occur close to resolution of the matter.

Each of the risks outlined above could result in increased regulatory supervision and affect our ability to attract and retain customers or maintain access to the capital markets.

Our businesses may be negatively affected by adverse events, publicity, government scrutiny or other reputational harm.

We are subject to reputational, legal and regulatory risk in the ordinary course of our business. The public perception of financial institutions remains negative. Harm to our reputation can result from

numerous sources, including adverse publicity arising from events occurring at BNY Mellon or in the financial markets, our perceived failure to comply with legal and regulatory requirements, the purported actions of our employees, alleged financial reporting irregularities involving ourselves or other large and well-known companies and perceived conflicts of interest. Our reputation could also be harmed by the failure of an affiliate, joint venture or a vendor or other third party with which we do business to comply with laws or regulations. Damage to our reputation could affect the confidence of clients, rating agencies, regulators, employees, stockholders and other stakeholders and could in turn have an impact on our business and results of operations.

Additionally, governmental scrutiny from regulators, legislative bodies and law enforcement agencies with respect to financial services companies has remained at elevated levels. Press coverage and other public statements that assert some form of wrongdoing (including, in some cases, press coverage and public statements that do not directly involve BNY Mellon) often result in some type of investigation or in lawsuits. Certain enforcement authorities have recently required admissions of wrongdoing, and in some cases, criminal pleas, as part of the resolution of matters brought by them against financial institutions. Any such resolution of a matter involving BNY Mellon could lead to increased exposure to civil litigation, could adversely affect our reputation and ability to do business in certain products and in certain jurisdictions and could have other negative effects.

A failure to deliver appropriate standards of service and quality by either us or our vendors, or a failure to appropriately describe our products and services can result in customer dissatisfaction, lost revenue, higher operating costs, heightened regulatory scrutiny and litigation. Should any of these or other events or factors that can undermine our reputation occur, there is no assurance that the additional costs and expenses that we may need to incur to address the issues giving rise to the reputational harm would not adversely affect our earnings and results of operations.

Acts of terrorism, natural disasters, pandemics, global conflicts and other geopolitical events may have a negative impact on our business and operations.

In conducting our business and maintaining and supporting our global operations, which includes vendors and other third parties, we are subject to risks of loss from the outbreak of hostilities, acts of terrorism, natural disasters, pandemics, global conflicts or other similar catastrophic events that could have a negative impact on our business and operations. We may also be impacted by unfavorable political, economic, legal or other developments, including but not limited to social or political instability, changes in governmental policies or policies of central banks, sanctions, expropriation, nationalization, confiscation of assets, price, capital and exchange controls, and changes in laws and regulations.

While we have business continuity and disaster recovery plans in place, such events could still damage our facilities, disrupt or delay normal business operations (including communications and technology), result in harm or cause travel limitations on our employees, with a similar impact on our clients, suppliers and counterparties. Catastrophic events could also negatively impact the purchase of our products and services if those events result in reduced capital markets activity, lower asset price levels, or disruptions in general economic activity, or in financial market settlement functions, which could negatively impact our business and results of operation. In addition, war, terror attacks, political unrest, global conflicts, efforts to combat terrorism and other potential military activities and outbreaks of hostilities may lead to an increase in delinquencies, bankruptcies or defaults that could result in our experiencing higher levels of non-performing assets, net charge-offs and provisions for credit losses, negatively impacting our business and operations.

Market Risk

We are dependent on fee-based business for a substantial majority of our revenue and our fee-based revenues could be adversely affected by slowing in market activity, weak financial markets, underperformance and/or negative trends in savings rates or in investment preferences.

Our principal operational focus is on fee-based business, which is distinct from commercial banking institutions that earn most of their revenues from loans and other traditional interest-generating products and services. In 2017, approximately 78% of our total revenue was fee-based. Our fee-based

businesses include investment management and performance fees, custody, corporate trust, depository receipts, clearing, collateral management and treasury services, which are highly competitive businesses.

Fees for many of our products and services are based on the volume of transactions processed, the market value of assets managed and administered, securities lending volume and spreads, and fees for other services rendered. Corporate actions, cross-border investing, global mergers and acquisitions activity, new debt and equity issuances, and secondary trading volumes all affect the level of our revenues. If the volumes of these activities decrease due to weak financial markets or otherwise, our revenues will also decrease, which would negatively impact our results of operations.

Poor investment returns in our investment management business, due to either weak market conditions or underperformance (relative to our competitors or to benchmarks) by funds or accounts that we manage or investment products that we design or sell, could result in reduced market values of portfolios that we manage and/or administer and may affect our ability to retain existing assets and to attract new clients or additional assets from existing clients. Market and regulatory trends have resulted in increased demand for lower fee asset management products, and for performance-based fees. Significant declines in the volume of capital markets activity would reduce the number of transactions we process and the amount of securities we lend and therefore would also have an adverse effect on our results of operations.

Our business generally benefits when individuals invest their savings in mutual funds and other collective funds, unit investment trusts or exchange-traded funds, or contribute more to defined contribution plans. The current shift to lower fee investment products has adversely impacted our fees. If our investment management revenues decline, we could have a decline in the fair value in our Asset Management reporting unit, one of the two reporting units in our Investment Management segment. If the fair value of the Asset Management reporting unit declines below its carrying value, we would be required to take an impairment charge.

Weakness and volatility in financial markets and the economy generally may materially adversely affect our business, results of operations and financial condition.

As a financial institution, our Investment Management, Depositary Receipts and Markets, including Securities Lending, businesses, are particularly sensitive to economic and market conditions, including in the capital and credit markets. When these markets are volatile or disruptive, we could experience a decline in our marked-to-market assets, including in our securities portfolio and our equity investments, including seed capital. Our results of operations may be materially affected by conditions in the financial markets and the economy generally, both in the U.S. and elsewhere around the world. A variety of factors impact global economies and financial markets, including interest rates and their associated yield curves, commodity pricing, such as a continued weakness in oil prices when compared to historic levels, certain market and political instabilities, volatile debt and equity market values, the strength of the U.S. dollar, high unemployment and governmental budget deficits (including, in the U.S., at the federal, state and municipal level), contagion risk from possible default by other countries on sovereign debt, declining business and consumer confidence and the risk of increased inflation. Any resulting economic pressure on consumers and lack of confidence in the financial markets may adversely affect certain portions of our business, financial condition and results of operations. In particular, we face the following risks in connection with these factors, some of which are discussed at greater length in separate risk factors:

- Geopolitical tension and economic instability in countries around the world can at times increase the demand for low-risk investments, particularly in U.S. Treasuries and the dollar. A “flight to safety” has historically increased BNY Mellon’s balance sheet, which has negatively impacted, and could continue to negatively impact, our leverage-based regulatory capital measures. A sustained “flight to safety” has historically triggered a decline in trading, capital markets and cross-border activity. Declining volumes in these activities would likely decrease our revenue, which would negatively impact our results of operations, financial condition and, if sustained in the long term, our business.

- The fees earned by our Investment Management business are higher as assets under management and/or investment performance increase. Those fees are also impacted by the composition of the assets under management, with higher fees for some asset categories as compared to others. Uncertain and volatile capital markets could result in reductions in assets under management because of investors’ decisions to withdraw assets or from simple declines in the value of assets under management as markets decline. At Dec. 31, 2017, we estimate that a 5% change in global equity markets, spread evenly throughout the year, would impact fee revenue by less than 1% and diluted earnings per common share by \$0.03 to \$0.05.
- Market conditions resulting in lower transaction volumes could have an adverse effect on the revenues and profitability of certain of our businesses such as clearing, settlement, payments and trading.
- Uncertain and volatile capital markets, particularly declines, could reduce the value of our investments in securities, including pension and other post-retirement plan assets.
- Derivative instruments we hold to hedge and manage exposure to market risks including interest rate risk, equity price risk, foreign currency risk and credit risk associated with our products and businesses might not perform as intended or expected, resulting in higher realized losses and unforeseen stresses on liquidity. Our derivative-based hedging strategies also rely on the performance of counterparties to such derivatives. These counterparties may fail to perform for various reasons resulting in losses on under-collateralized positions.
- Continuing relative weakness in oil prices, or a decline, may continue to negatively impact capital markets and may impact the ability of certain of our clients, including oil and gas exploration and production companies and sovereign funds in oil-exporting countries, to continue using our services or repay outstanding loans. Increased defaults among oil and gas exploration and production companies may also negatively impact the high-yield market and our high-yield funds.

- Market volatility could produce downward pressure on our stock price and credit availability without regard to our underlying financial strength.
- The process we use to estimate our projected credit losses and to ascertain the fair value of securities held by us is subject to uncertainty in that it requires use of statistical models and difficult, subjective and complex judgments, including forecasts of economic conditions and how these conditions might impair the ability of our borrowers and others to meet their obligations. In uncertain and volatile capital markets, our ability to estimate our projected credit losses may be impaired, which could adversely affect our overall profitability and results of operations.

For a discussion of our management of market risk, see “Risk Management – Market risk.”

The United Kingdom’s referendum decision to leave the EU has had and may continue to have negative effects on global economic conditions, global financial markets, and our business and results of operations.

In 2016, the UK voted to leave the EU in a nation-wide referendum. This has created an uncertain political and economic environment in the UK, and may create such environments in other EU member states. Political and economic uncertainty has in the past led to, and the outcome of the referendum and the withdrawal of the UK from the EU could lead to, declines in market liquidity and activity levels, volatile market conditions, a contraction of available credit, lower or negative interest rates, weaker economic growth and reduced business confidence.

Following the referendum and the commencement of the exit negotiations between the UK and the EU, the long-term nature of the UK’s relationship with the EU remains unclear, and there is considerable uncertainty as to when the framework for any such relationship governing both the access of the UK to EU markets and vice versa will be determined and implemented. As a result, we, including our European affiliates, may face additional operational, regulatory and compliance costs. In addition, the regulatory, tax and supervisory regimes applicable to our European operations are expected to change; however, the nature and timing of such changes are uncertain and

cannot be predicted. Certain of our European operations are conducted through subsidiaries located in the UK and other EU member states. If our UK subsidiaries are not able to retain their EU financial services “passport,” or an equivalent version of access to enable cross-border services throughout the EU single market without needing to obtain local authorizations then we may incur costs to move operations and, potentially, personnel from our UK operations to our operations in other EU member states. The outcome of the UK’s decision to exit the EU has also created uncertainty with regard to divergent regulatory standards, which may affect the operational capabilities such as the transfer of data between the UK and EU after the UK leaves the EU.

Following the referendum, volatility in the exchange rate for the British pound has increased. A decrease in the British pound compared to the U.S. dollar would negatively impact our Investment Management business, which typically has more non-U.S. dollar denominated revenues than expenses. Volatility in exchange rates may also have a negative effect on our Investment Services business, which typically has more non-U.S. dollar denominated expenses than revenues.

The effects of the result of the referendum and the UK’s decision to exit the EU, including those described above, could adversely affect our business, results of operations and financial condition.

Changes in interest rates and yield curves could have a material adverse effect on our profitability.

We earn revenue, known as “net interest revenue,” on the difference between the interest income earned on our interest-earning assets, such as the loans we make and the securities we hold in our investment securities portfolio, and the interest expense incurred on our interest-bearing liabilities, such as deposits and borrowed money. Our net interest margin, which is the result of dividing net interest revenue by average interest-earning assets, and our cash flows, are sensitive to changes in the spread between short-term and long-term interest rates (the “yield curve”). Our net interest margin tends to increase in a positive yield curve environment and decrease when the yield curve flattens or inverts. Notwithstanding the recent increase in the Fed Funds target rate to between 1.25% and 1.50%, we remain in a historically low-rate environment. A continuing low rate environment combined with a flattening of the yield curve may

adversely impact our revenue and results of operations by compressing our net interest spreads, particularly if we are unable to replace our higher-yielding maturing assets with assets of comparable yields, which will constrain our ability to achieve desired net interest margins.

The 75 basis point rise in rates in the past year, or future rate rises, could trigger one or more of the following, which could adversely impact our business, results of operations and financial condition, including:

- less liquidity in bonds and fixed-income funds in the case of a sharp rise in interest rates resulting in lower performance, yield and fees;
- increased number of delinquencies, bankruptcies or defaults and more nonperforming assets and net charge-offs, as borrowers may have more difficulty making higher interest payments;
- difficulty in modeling predicted deposit levels and depositor behavior, which could impact our ability to manage liquidity and capital;
- decreases in deposit levels and higher redemptions from our fixed-income funds or separate accounts, as clients move funds into investments with higher rates of return;
- decreases in stable deposit levels, which may result in further pressure on our LCR measure;
- a decline in our risk-based capital ratios;
- reduction in accumulated other comprehensive income (“OCI”) in our shareholders’ equity and therefore our tangible common equity due to the impact of rising long term rates on our available-for-sale securities in our investment portfolio; or
- higher funding costs.

A more detailed discussion of the interest rate and market risks we face is contained in “Risk Management.”

We may experience write-downs of securities that we own and other losses related to volatile and illiquid market conditions, reducing our earnings and impacting our financial condition.

We maintain an investment securities portfolio of various holdings, types and maturities. At Dec. 31, 2017, these securities were primarily classified as available-for-sale, which are recorded on our balance sheet at fair value with unrealized gains or losses reported as a component of accumulated other comprehensive income, net of tax. The securities in our held-to-maturity portfolio, recorded on our balance sheet at amortized cost, were \$40.8 billion and comprised approximately 34% of our investment securities portfolio at Dec. 31, 2017. To the extent unhedged, the accounting and regulatory treatment of our investment securities portfolio in an available-for-sale accounting environment may have more volatility than a more traditional held-for-investment loan portfolio, or a securities portfolio comprised exclusively of U.S. Treasury securities.

Our investment securities portfolio represents a greater proportion of our consolidated total assets (approximately 32% at Dec. 31, 2017), and our loans represent a smaller proportion of our consolidated total assets (approximately 17% at Dec. 31, 2017), in comparison to many other major U.S. financial institutions due to our custody and trust bank business model. As such, our capital levels and results of operations and financial condition are materially exposed to the risks associated with our investment portfolio.

If any of our available-for-sale securities experience an other-than-temporary impairment, it would negatively impact our earnings. If our held-to-maturity securities experience a loss in fair value, it would negatively impact the fair value of our securities portfolio, although it would not impact our earnings unless a credit event occurred. Many of these securities experienced significant liquidity, valuation and credit quality deterioration during the 2008 financial crisis and could experience a similar deterioration in another financial crisis. U.S. state and municipal bonds have been experiencing stress in light of fiscal concerns.

Under the U.S. capital rules, after-tax changes in the fair value of available-for-sale investment securities are included in CET1 capital. Since loans held for investment, or securities in a held-to-maturity accounting classification, are not subject to a fair-value accounting framework, changes in the fair value of these instruments (other than incurred credit losses) are not similarly included in the determination of CET1 capital. As a result, we may experience

increased variability in our CET1 capital relative to those other major financial institutions who maintain a lower proportion of their consolidated total assets in an available-for-sale accounting classification.

Generally, the fair value of available-for-sale securities in the securities portfolio is determined based upon market values available from third-party sources. During periods of market disruption, it may be difficult to value certain of our investment securities if trading becomes less frequent and/or market data becomes less observable. As a result, valuations may include inputs and assumptions that are less observable or require greater estimation and judgment as well as valuation methods which are more complex. These values may not be ultimately realizable in a market transaction, and such values may change very rapidly as market conditions change and valuation assumptions are modified. Decreases in value may have a material adverse effect on our results of operations or financial condition. If any of our securities suffer credit losses, as we experienced with some of our investments in 2009, we may recognize the credit losses as an other-than-temporary impairment which could impact our revenue in the quarter in which we recognize the losses. The decision on whether to record an other-than-temporary impairment or write-down is determined in part by management's assessment of the financial condition and prospects of a particular issuer, projections of future cash flows and recoverability of the particular security. Management's conclusions on such assessments are highly judgmental and include assumptions and projections of future cash flows which may ultimately prove to be incorrect as assumptions, facts and circumstances change. On the other hand, securities held in a held-to-maturity accounting environment are limited in the actions we can take absent a significant deterioration in the issuer's creditworthiness. Therefore, we may be constrained in our ability to liquidate a held-to-maturity security that is deteriorating in value, which would negatively impact the fair value of our securities portfolio. If our determinations change about our intention or ability to not sell securities that have experienced a reduction in fair value below their amortized cost, we could be required to recognize an other-than-temporary loss in earnings for the entire difference between fair value and amortized cost.

For information regarding our investment securities portfolio, refer to "Consolidated balance sheet review - Investment securities" and for information regarding

the sensitivity of and risks associated with the market value of portfolio investments and interest rates, refer to "Critical accounting estimates - Fair value - Securities" and "- Other-than-temporary impairment."

Ongoing concerns about the financial stability of certain countries, new barriers to global trade or a breakup of the EU or Eurozone could have a material adverse effect on our business and results of operations.

There remain ongoing concerns about the financial stability of certain countries, including the possibility of sovereign debt defaults and bank failures. This has led to, and could continue to lead to, declines in market liquidity, a contraction of available credit, and diminished economic growth and business confidence in those countries, with potential collateral consequences to other countries as well.

Recent political developments in the U.S. and Europe may result in new barriers to global business, including a partial or full break-up of the EU, Eurozone or the North American Free-Trade Agreement ("NAFTA"), which could lead to redenomination of certain obligations of obligors in exiting countries. Any such exit and redenomination would cause significant uncertainty with respect to outstanding obligations of counterparties and debtors in any exiting country, whether sovereign or otherwise, and could lead to complex and lengthy disputes and litigation. Barriers to global business, or even the anticipation of such barriers, could create market uncertainty and stress, which could cause, among other things, severe disruption to equity markets, significant increases in bond yields generally, potential failure or default of financial institutions, including those of systemic importance, a significant decrease in global liquidity, a freeze-up of global credit markets and a potential worldwide recession. Any of these events could have a material adverse impact on our business or results of operations.

We are primarily exposed to disruptions in global markets in a number of principal areas - on our balance sheet, in certain interest-bearing deposits with banks, loans, trading assets and investment securities, as well as fee revenue. Additionally, market disruptions could lead to, among other things, a negative impact on our fee revenue and a "flight to safety," triggering increased client deposits and altering the size and composition of our balance

sheet, which could adversely impact our leverage-based regulatory capital measures. For additional information regarding our exposure to certain countries, please see “International operations - Country risk exposure.”

Our international clients accounted for 36% of our revenue in 2017. Given the scope of our global operations, clients and counterparties, persistent disruptions in the global financial markets, or the attempt of a country to abandon the euro or persistent weakness in a leading global currency could have a material adverse impact on our business or results of operations.

Our businesses and operations from time to time enter into new regions. Various countries have experienced severe economic and financial disruptions, including significant devaluations of their currencies, defaults or threatened defaults on sovereign debt, capital and currency exchange controls, and low or negative growth rates in their economies. Crime, corruption, war or military actions, and a lack of an established legal and regulatory framework are additional challenges. Revenue from international operations and trading in non-U.S. securities and other obligations may be subject to negative fluctuations as a result. The possible effects of any of these conditions may adversely affect our business and results of operations.

Our FX revenue may be adversely affected by decreases in market volatility and the cross-border investment activity of our clients.

Our foreign exchange trading generates revenues which are primarily driven by the volume of client transactions and the spread realized on these transactions, both of which are impacted by market volatility and the impact of foreign exchange hedging activities. Our clients’ cross-border investing activity could decrease in reaction to economic and political uncertainties, including changes in laws or regulations governing cross-border transactions, such as currency controls or tariffs. Uncertainties resulting from terrorist attacks and/or military actions may also negatively affect cross-border investments activity, which could negatively impact revenue.

Volumes and/or spreads in some of our products tend to benefit from currency volatility and are likely to decrease during times of lower currency volatility. Our revenues also depend on our ability to manage

the risk associated with the currency transactions we execute and program pricing.

Furthermore, a shift by custody clients from the standing instruction programs to other trading options combined with competitive market pressures on the foreign exchange business may negatively impact our FX revenue. Continued growth of electronic FX trading capabilities is resulting in a shift of volume to lower margin channels.

Credit and Liquidity Risk

The failure or perceived weakness of any of our significant counterparties, many of whom are major financial institutions and sovereign entities, and our assumption of credit and counterparty risk, could expose us to loss and adversely affect our business.

We have exposure to clients and counterparties in many different industries, particularly financial institutions, as a result of trading, clearing and financing, providing custody services, securities lending services or other relationships. We routinely execute transactions with global clients and counterparties in the financial industry as well as sovereigns and other governmental or quasi-governmental entities. Our direct exposure consists of the extension of secured and unsecured credit to clients and use of our balance sheet. In addition to traditional credit activities, we also extend intraday credit in order to facilitate our various processing, settlement and intermediation activities. Our ability to engage in funding or other transactions could be adversely affected by the actions and commercial soundness of other financial institutions or sovereign entities, as defaults or non-performance (or even uncertainty concerning such default or non-performance) by one or more financial institutions, or the financial services industry generally, have in the past led to market-wide liquidity problems and could lead to losses or defaults by us or by other institutions (including our counterparties and/or clients) in the future. The consolidation and failures of financial institutions during the last financial crisis increased the concentration of our client and counterparty risk.

As a result of our membership in several industry clearing or settlement exchanges and central counterparty clearinghouses, we may be required to guarantee obligations and liabilities or provide financial support in the event that other members do not honor their obligations or default. These

obligations may be limited to members that dealt with the defaulting member or to the amount (or a multiple of the amount) of our contribution to a clearing or settlement exchange guarantee fund, or, in a few cases, the obligation may be unlimited.

The degree of client demand for short-term credit also tends to increase during periods of market turbulence, exposing us to further credit-related risks. For example, investors in mutual funds for which we act as custodian may engage in significant redemption activity due to adverse market or economic conditions. We may then extend intraday credit to our fund clients in order to facilitate their ability to pay such redemptions. This may negatively impact our leverage-based capital ratios, and in times of sustained market volatility, may result in significant leverage-based ratio declines.

When we provide credit to clients in connection with providing cash management, clearing, custodial and other services, we are exposed to potential loss if the client experiences credit difficulties. We are also generally not able to net exposures across affiliated clients or counterparties and may not be able to net exposures to the same legal entity across multiple products. In addition, we may incur a loss in relation to one entity or product even though our exposure to one of the entities' affiliates is over-collateralized. Moreover, not all of our client or counterparty exposure is secured.

In our agency securities lending program, we act as lender's agent on behalf of our clients, the lenders of securities, in securities lending transactions with our clients' counterparties (including broker-dealers), acting as borrowers, wherein securities are lent by our clients and the securities loans are collateralized by cash or securities posted by such counterparties. Typically, in the case of cash collateral, our clients authorize us as their agent to invest the cash collateral in approved investments pursuant to each client's investment guidelines and instructions. Such approved investments may include reverse repurchase transactions with repo counterparties. In many cases, in the securities loans we enter into on behalf of our clients, we contractually agree to replace the client's loaned securities that the borrower failed to return due to certain defaults by the borrower, mainly the borrower's insolvency. Therefore, in situations where the market value of the loaned securities that the borrower failed to return to a client (which loaned securities we are obligated to replace and return to the

client) exceeds the amount of proceeds resulting from the liquidation of the client's approved investments and cash and non-cash collateral of such client, we may be responsible for the shortfall amount necessary to purchase any replacement securities. In addition, in certain cases, we may also undertake the risk of loss in certain circumstances related to approved investments that are reverse repurchase transactions as described above. In these two scenarios, we, rather than our clients, are exposed to the risks of the defaulting counterparty in the securities lending transactions and, where applicable, in the reverse repurchase transactions. For further discussion on our securities lending indemnifications, see "Commitments and contingent liabilities - Off-balance sheet arrangements" in Note 20 of the Notes to Consolidated Financial Statements.

From time to time, we assume concentrated credit risk at the individual obligor, counterparty or group level, potentially exposing us to a single market or political event or a correlated set of events. For example, we may be exposed to defaults by companies located in countries with deteriorating economic conditions or by companies in certain industries. Such concentrations may be material. Our material counterparty exposures change daily, and the counterparties or groups of related counterparties to which our risk exposure is material also vary during any reported period; however, our largest exposures tend to be to other financial institutions, clearing organizations, and governmental entities, both inside and outside the U.S. Concentration of counterparty exposure presents significant risks to us and to our clients because the failure or perceived weakness of our counterparties (or in some cases of our clients' counterparties) has the potential to expose us to risk of financial loss. Changes in market perception of the financial strength of particular financial institutions or sovereign issuers can occur rapidly, are often based on a variety of factors and are difficult to predict.

Although our overall business is subject to these interdependencies, several of our businesses are particularly sensitive to them, including our currency and other trading activities, our securities lending and securities finance businesses and our investment management business. If we experience any of the losses described above, it may materially and adversely affect our results of operations.

We are also subject to the risk that our rights against third parties may not be enforceable in all circumstances. In addition, deterioration in the credit quality of third parties whose securities or obligations we hold, including a deterioration in the value of collateral posted by third parties to secure their obligations to us under derivatives contracts and other agreements, could result in losses and/or adversely affect our ability to rehypothecate or otherwise use those securities or obligations for liquidity purposes. Disputes with clients and counterparties as to the valuation of collateral can significantly increase in times of market stress and illiquidity. In addition, disruptions in the liquidity or transparency of the financial markets may result in our inability to sell, syndicate or realize the value of our positions, thereby leading to increased concentrations. An inability to reduce our positions may not only increase the market and credit risks associated with such positions, but may also increase the level of RWA on our balance sheet, thereby increasing our capital requirements and funding costs, all of which could adversely affect the operations and profitability of our businesses.

Under evolving regulatory restrictions on credit exposure, which include a broadening of the measure of credit exposure, we may be required to limit our exposures to specific obligors or groups, including financial institutions, to levels that we may currently exceed. These credit exposure restrictions under such evolving regulations may adversely affect our businesses and may require us to modify our operating models or the policies and practices we use.

Our business, financial condition and results of operations could be adversely affected if we do not effectively manage our liquidity.

BNY Mellon's operating model and overall strategy rely heavily on our access to financial market utilities and global capital markets. Without such access, it would be difficult to process payments and settle and clear transactions on behalf of our clients. Deterioration in our liquidity position, whether actual or perceived, can impact our market access by affecting participants' willingness to transact with us. Changes to our liquidity can be caused by various factors, such as funding mismatches, market constraints disabling asset to cash conversion, inability to issue debt, run-off of core deposits, and contingent liquidity events such as additional collateral posting. Changes in economic conditions

or exposure to credit, market, operational, legal and reputational risks can also affect our liquidity.

Our business is dependent in part on our ability to meet our cash and collateral obligations at a reasonable cost for both expected and unexpected cash flows. We also must manage liquidity risks on an intraday basis, in a manner designed to ensure that we can access required funds during the business day to make payments or settle immediate obligations, often in real time. We receive client deposits through a variety of investment management and investment servicing businesses and we rely on those deposits as a low-cost and stable source of funding. Our ability to continue to receive those deposits, and other short-term funding sources, is subject to variability based on a number of factors, including volume and volatility in the global securities markets, the relative interest rates that we are prepared to pay for those deposits, and the perception of the safety of those deposits or other short-term obligations relative to alternative short-term investments available to our clients. We could lose deposits if we suffer a significant decline in the level of our business activity, our credit ratings are materially downgraded, interest rates rise, or we are subject to significant negative press or significant regulatory action or litigation, among other reasons. If we were to lose a significant amount of deposits we may need to replace such funding with more expensive funding and/or reduce assets, which would reduce our net interest revenue.

In addition, the Parent's access to the debt capital markets is a significant source of liquidity. Events or circumstances often outside of our control, such as market disruptions, government fiscal and monetary policies, or loss of confidence by securities purchasers or counterparties in us or in the funds markets, could limit our access to capital markets, increase our cost of borrowing, adversely affect our liquidity, or impair our ability to execute our business plan. In addition, clearing organizations, regulators, clients and financial institutions with which we interact may exercise the right to require additional collateral based on market perceptions or market conditions, which could further impair our access to and cost of funding. Market perception of sovereign default risks can also lead to inefficient money markets and capital markets, which could further impact BNY Mellon's funding availability and cost. Conversely, if we experience excess liquidity inflows, it could increase interest expense, limit our financial

flexibility, and increase the size of our total assets in a manner that could have a negative impact on our capital ratios.

Adopted and proposed regulations have been designed to address certain liquidity risks of large banking organizations, including BNY Mellon. The LCR and the Dodd-Frank Act's enhanced prudential standards impose liquidity management requirements on us that require us to increase our holdings of highly liquid, but potentially lower-yielding assets. These regulations also impact our ability to hold certain deposits deemed to pose a higher risk of runoff in the event of financial distress.

Under the U.S. capital rules, the size of the capital surcharge that applies to U.S. G-SIBs is based in part on a U.S. G-SIB's reliance on short-term wholesale funding, including certain types of deposit funding, which may increase the cost of such funding. Furthermore, certain non-U.S. authorities, including the European Commission, have proposed legislation or regulations requiring large banks to incorporate a separate subsidiary in countries in which they operate, and to maintain independent capital and liquidity at foreign subsidiaries. If adopted, these requirements could hinder our ability to efficiently manage our funding and liquidity in a centralized manner. There can be no assurances that these measures will be successful in limiting BNY Mellon's liquidity risk.

In addition, our cost of funding could be affected by actions that we may take in order to satisfy applicable LCR and NSFR requirements, to lower our G-SIB surcharge, to satisfy the amount of eligible long-term debt outstanding under the TLAC Rule, to address obligations under our resolution plan or to satisfy regulatory requirements in non-U.S. jurisdictions relating to the pre-positioning of liquidity in certain subsidiaries.

If we are unable to raise funds using the methods described above, we would likely need to finance or liquidate unencumbered assets, such as our central bank deposits and bank placements, or securities in our investment portfolio to meet funding needs. We may be unable to sell some of our assets, or we may have to sell assets at a discount from market value, either of which could adversely affect our financial condition and results of operations. Further, our ability to sell assets may be impaired if other market participants are seeking to sell similar assets at the

same time, which could occur in a liquidity or other market crisis. Additionally, if we experience cash flow mismatches, deposit run-off or market constraints resulting from our inability to convert assets to cash or access capital markets, our liquidity could be severely impacted. During periods of market uncertainty, our level of client deposits has in recent years tended to increase; however, because these deposits have high potential run-off rates, we have historically deposited these so-called excess deposits with central banks and in other highly liquid and low-yielding instruments.

If we are unable to continue to fund our assets through deposits or access capital markets on favorable terms or if we suffer an increase in our borrowing costs or otherwise fail to manage our liquidity effectively, our liquidity, net interest margin, financial results and condition may be materially adversely affected. In certain cases, this could require us to raise additional capital through the issuance of preferred or common stock, which could dilute the ownership of existing stockholders, and/or reduce our common stock dividend to preserve capital.

For a further discussion of our liquidity, see "Liquidity and dividends."

Any material reduction in our credit ratings or the credit ratings of our principal bank subsidiaries, The Bank of New York Mellon or BNY Mellon, N.A., could increase the cost of funding and borrowing to us and our rated subsidiaries and have a material adverse effect on our results of operations and financial condition and on the value of the securities we issue.

Our debt and preferred stock and the debt and deposits of our principal bank subsidiaries, The Bank of New York Mellon and BNY Mellon, N.A., are currently rated investment grade by the major rating agencies. These rating agencies regularly evaluate us and our rated subsidiaries and their outlook on us and our rated subsidiaries. Their credit ratings are based on a number of factors, including our financial strength, performance, prospects and operations as well as factors not entirely within our control, including conditions affecting the financial services industry generally as well as the U.S. government. Rating agencies employ different models and formulas to assess the financial strength of a rated company, and from time to time rating agencies have,

in their discretion, altered these models. Changes to rating agency models, general economic conditions, or other circumstances outside of our control could impact a rating agency's judgment of the rating or outlook it assigns us or our rated subsidiaries.

In view of the difficulties experienced during the 2008 financial crisis by many financial institutions, we believe that the rating agencies have heightened their level of scrutiny, increased the frequency and scope of their credit reviews, have requested additional information, and have adjusted upward the requirements employed in their models for maintenance of rating levels. There can be no assurance that we or our rated subsidiaries will maintain our respective credit ratings or outlook on our securities.

A material reduction in our credit ratings or the credit ratings of our rated subsidiaries could have a material adverse effect on our access to credit markets, the related cost of funding and borrowing, our credit spreads, our liquidity and on certain trading revenues, particularly in those businesses where counterparty creditworthiness is critical. In addition, in connection with certain over-the-counter derivatives contracts and other trading agreements, counterparties may require us or our rated subsidiaries to provide additional collateral or to terminate these contracts and agreements and collateral financing arrangements in the event of a credit ratings downgrade below certain ratings levels. The requirement to provide additional collateral or terminate these contracts and agreements could impair our liquidity by requiring us to find other sources of financing or to make significant cash payments or securities movements. A downgrade by any one rating agency, depending on the agency's relative ratings of the firm at the time of the downgrade, may have an impact comparable to the impact of a downgrade by all rating agencies. If a rating agency downgrade were to occur during broader market instability, our options for responding to events may be more limited and more expensive. An increase in the costs of our funding and borrowing, or an impairment of our liquidity, could have a material adverse effect on our results of operations and financial condition. A material reduction in our credit ratings also could decrease the number of investors and counterparties willing or permitted to do business with or lend to us and adversely affect the value of the securities we have issued or may issue in the future.

We cannot predict what actions rating agencies may take, or what actions we may elect or be required to take in response thereto, which may adversely affect us. Our and our subsidiaries' ratings could be downgraded at any time and without any notice by any of the rating agencies. For further discussion on the impact of a credit rating downgrade, see "Disclosure of contingent features in OTC derivative instruments" in Note 21 of the Notes to Consolidated Financial Statements.

We could incur losses if our allowance for credit losses, including loan and lending related commitments reserves, is inadequate.

When we loan money, commit to loan money or provide credit or enter into another contract with a counterparty, we incur credit risk, or the risk of loss if our borrowers do not repay their loans or our counterparties fail to perform according to the terms of their agreements. Our revenues and profitability are adversely affected when our borrowers default, in whole or in part, on their loan obligations to us or when there is a significant deterioration in the credit quality of our loan portfolio. We reserve for potential future credit losses by recording a provision for credit losses through a charge to earnings. The allowance for loan losses and allowance for lending-related commitments represents management's estimate of probable losses inherent in our credit portfolio. We use a quantitative methodology and qualitative framework for determining the allowance for loan losses and the allowance for lending-related commitments. Within this qualitative framework, management applies judgment when assessing internal risk factors and environmental factors to compute an additional allowance for each component of the loan portfolio. As is the case with any such judgments, we could fail to identify these factors or accurately estimate their impact. We cannot provide any assurance as to whether charge-offs related to our credit exposure may occur in the future. Current and future market and economic developments may increase default and delinquency rates and negatively impact the quality of our credit portfolio, which may impact our charge-offs. Although our current estimates contemplate current conditions and how we expect them to change in the future, it is reasonably possible that actual conditions could be worse than anticipated in those estimates, which could materially affect our results of operations and financial condition. See "Critical accounting estimates."

Strategic Risk

New lines of business, new products and services or transformational or strategic project initiatives may subject us to additional risks, and the failure to implement these initiatives could affect our results of operations.

From time to time, we may launch new lines of business, offer new products and services within existing lines of business or undertake transformational or strategic projects. There are substantial risks and uncertainties associated with these efforts. We invest significant time and resources in developing and marketing new lines of business, products and services and executing on our transformational and strategic initiatives. For example, we have devoted considerable resources to developing new technology solutions for our clients. If these technology solutions are not successful, it could adversely impact our reputation, business and results of operations.

Regulatory requirements can affect whether initiatives are able to be brought to market in a manner that is timely and attractive to our customers. Initial timetables for the development and introduction of new lines of business or new products or services and price and profitability targets may not be met. Furthermore, our revenues and costs may fluctuate because new businesses or products and services generally require startup costs while revenues may take time to develop, which may adversely impact our results of operations.

From time to time we undertake transformational or strategic project initiatives. Significant effort and resources are necessary to manage and oversee the successful completion of these initiatives. These initiatives often place significant demands on management and a limited number of employees with subject matter expertise and may involve significant costs to implement as well as increase operational risk as employees learn to process transactions under new systems. The failure to properly execute on these transformational or strategic initiatives could adversely impact our business, reputation and results of operations.

We are subject to competition in all aspects of our business, which could negatively affect our ability to maintain or increase our profitability.

Many businesses in which we operate are intensely competitive around the world. Competitors include other banks, trading firms, broker-dealers, investment banks, asset managers, insurance companies, financial technology firms and a variety of other financial services and advisory companies whose products and services span the markets in which we operate. We compete on the basis of a number of factors, including transaction execution, capital or access to capital, products and services, innovation, reputation, lending limits, rates and price. Larger and more geographically diverse companies, and financial technology firms that are not subject to the same level of regulation, may be able to offer financial products and services at more competitive prices than we are able to offer. Pricing pressures, as a result of the willingness of competitors to offer comparable or improved products or services at a lower price, may result in a reduction in the price we can charge for our products and services, which could, and in some cases has, negatively affected our ability to maintain or increase our profitability. Low economic growth may result in clients exiting markets, which could lead to a loss of business for us.

In addition, technological advances have made it possible for other types of non-depository institutions, such as financial technology firms, outsourcing companies and data processing companies, to offer a variety of products and services competitive with certain areas of our business.

Markets, and the manner in which our clients interact and transact within markets, can evolve quickly, particularly if new or disruptive technologies are introduced. Our failure to either anticipate, or participate in, the transformational change within a given market could result in potential negative financial impact. Competitors may develop technological advances that could negatively impact our transaction execution or the pricing of our clearing, settlement, payments and trading activities. Increased competition in any of these areas may require us to make additional capital investments in our businesses in order to remain competitive. For example, along with other financial institutions, we are researching ways to adapt robotics and distributed ledger technology to bank services. If we are not able to adapt these technologies as successfully as our peers, we may become less competitive. In addition, even if successful from a competitive standpoint, the use and implementation of new and emerging

technologies may increase the risk that we experience cybersecurity or other information technology events.

Furthermore, recently implemented and proposed regulations may impact our ability to conduct certain of our businesses in a cost-effective manner or at all. The more restrictive laws and regulations applicable to the largest U.S. financial services institutions, including the U.S. capital rules, can put us at a competitive disadvantage relative to both our non-U.S. competitors and certain U.S. competitors. See “Supervision and Regulation.”

Our business may be adversely affected if we are unable to attract and retain employees.

Our success depends, in large part, on our ability to attract new employees, retain and motivate our existing employees, and continue to compensate our employees competitively amid heightened regulatory restrictions. Competition for the most skilled employees in most activities in which we engage can be intense, and we may not be able to recruit and retain key personnel.

We rely on certain employees with subject matter expertise to assist in the implementation of important initiatives. As technology and risk management increase in focus in the financial industry, competition for technologists and risk personnel has intensified, which could constrain our ability to execute on certain of our strategic initiatives.

Our ability to attract and retain key executives and other employees may be negatively affected by recent legislation and other existing restrictions applicable to incentive and other compensation programs, including new limits on our ability to deduct for federal income tax purposes compensation in excess of \$1 million paid to certain current and former executives, as well as deferral, clawback requirements and other limits on incentive compensation. Some of these restrictions may not apply to some of our competitors and to other institutions with which we compete for talent.

The loss of employees’ skills, knowledge of the market, industry experience, and the cost of finding replacements may hurt our business. If we are unable to continue to attract and retain highly qualified employees, our performance, including our competitive position, could be adversely affected.

Our strategic transactions present risks and uncertainties and could have an adverse effect on our business, results of operations and financial condition.

From time to time, to achieve our strategic objectives, we have acquired, disposed of, or invested in (including through joint venture relationships) companies and businesses, and may do so in the future. Our ability to pursue or complete strategic transactions is in certain instances subject to regulatory approval and we cannot be certain when or if, or on what terms and conditions, any required regulatory approvals would be granted. Moreover, to the extent we pursue a strategic transaction, there can be no guarantee that the transaction will close when anticipated, or at all. If a strategic transaction does not close, or if the strategic transaction fails to maximize shareholder value or required regulatory approval is not obtained, it could have an adverse effect on our business, results of operations and financial condition.

Each acquisition poses integration challenges, including successfully retaining and assimilating clients and key employees, capitalizing on certain revenue synergies and integrating the acquired company’s culture, control functions, systems and technology. In some cases, acquisitions involve entry into new businesses or new geographic or other markets, and these situations also present risks and uncertainties in instances where we may be inexperienced in these new areas. We may be required to spend a significant amount of time and resources to integrate these acquisitions. The anticipated integration benefits may take longer to achieve than projected and the time and cost needed to consolidate control functions, platforms and systems may significantly exceed our estimates. If we fail to successfully integrate strategic acquisitions, including doing so in a timely and cost-effective manner, we may not realize the expected benefits, which could have an adverse impact on our business, financial condition and results of operations. In addition, we may incur expenses, costs, losses, penalties, taxes and other liabilities related to the conduct of the acquired businesses prior to the date of our ownership (including in connection with the defense and/or settlement of legal and regulatory claims, investigations and proceedings) which may not be recoverable through indemnification or otherwise. If the purchase price we pay in an acquisition exceeds the fair value of assets acquired

less the liabilities we assume, then we may need to recognize goodwill on our consolidated balance sheet. Goodwill is an intangible asset that is not eligible for inclusion in regulatory capital under applicable requirements. Further, if the value of the acquisition declines, we may be required to record an impairment charge.

Each disposition also poses challenges, including separating the disposed businesses, products and systems in a way that is cost-effective and is not disruptive to us or our customers. In addition, the inherent uncertainty involved in the process of evaluating, negotiating or executing a potential sale of one of our companies or businesses may cause the loss of key clients, employees and business partners which could have an adverse impact on our business, financial condition and results of operations.

Joint ventures and non-controlling investments contain potentially increased financial, legal, reputational, operational, regulatory and/or compliance risks. Notwithstanding our controls and risk management framework, which are designed to manage these risks, we may be dependent on joint venture partners, controlling shareholders or management who may have business interests, strategies or goals that are inconsistent with ours. Business decisions or other actions or omissions of the joint venture partner, controlling shareholders or management may adversely affect the value of our investment, impacting our results of operations, result in litigation or regulatory action against us and otherwise damage our reputation and brand.

Other Risks

Tax law changes, including the recent enactment of the Tax Act, or challenges to our tax positions with respect to historical transactions may adversely affect our net income, effective tax rate and our overall results of operations and financial condition.

The recent enactment of the Tax Act has reduced our statutory tax rate and implemented a partial territorial rather than worldwide tax system, among other changes. We are currently analyzing the Tax Act and will continue to analyze the Tax Act as further guidance is issued to determine the law's impact to us. Our assessments of the impact of the Tax Act, including the impact in the fourth quarter of 2017 of a \$427 million increase in net income and \$551 million decrease in the numerator of our CET1, Tier 1 and

Total capital ratios, is based on certain assumptions and our interpretation of the Tax Act may change, possibly materially, as we refine our analysis and as further information becomes available. As a result, our business or net income may be materially negatively impacted. In addition, future tax laws or the expiration of or changes in existing tax laws, or the interpretation of those laws worldwide, could also have a material impact on our business or net income. Our actions taken in response to, or reliance upon, such changes in the tax laws may impact our tax position in a manner that may result in lower earnings.

In the course of our business, we receive inquiries and challenges from both U.S. and non-U.S. tax authorities on the amount of taxes we owe. If we are not successful in defending these inquiries and challenges, we may be required to adjust the timing or amount of taxable income or deductions or the allocation of income among tax jurisdictions, all of which can require a greater provision for taxes or otherwise negatively affect earnings. Probabilities and outcomes are reviewed as events unfold, and adjustments to the reserves are made when necessary, but the reserves may prove inadequate because we cannot necessarily accurately predict the outcome of any challenge, settlement or litigation or the extent to which it will negatively affect us or our business. See Note 10 of the Notes to Consolidated Financial Statements for further information.

Our ability to return capital to shareholders is subject to the discretion of our board of directors and may be limited by U.S. banking laws and regulations, including those governing capital and the approval of our capital plan, applicable provisions of Delaware law or our failure to pay full and timely dividends on our preferred stock.

Holders of our common and preferred stock are only entitled to receive such dividends or other distributions of capital as our Board of Directors may declare out of funds legally available for such payments. Although we have historically declared cash dividends on our common and preferred stock, we are not required to do so. In addition to the Board of Directors' approval, our ability to take certain actions, including our ability to make certain acquisitions, declare dividends or repurchase our common stock, is dependent on, among other things, Federal Reserve non-objection under the annual regulatory review of the results of the CCAR process

and the supervisory stress tests required under the Dodd-Frank Act. These evaluations, in turn, are dependent on, among other things, our successful demonstration that we can maintain capital levels above regulatory minimums in the event of a stressed market environment, as well as the Federal Reserve's qualitative assessment of the robustness of our capital adequacy process and the assumptions and analysis underlying the capital plan. There can be no assurance that the Federal Reserve will not object to our future capital plans or that we will perform adequately on our supervisory stress tests. If the Federal Reserve objects to our proposed capital actions or we underperform on our stress tests, we may be required to revise our stress-testing or capital management approaches, resubmit our capital plan or postpone, or cancel or alter our planned capital actions, and we would not be permitted to make any capital distributions other than those to which the Federal Reserve has indicated in writing its non-objection. In addition, if there have been or will be changes in our risk profile (including a material change in business strategy or risk exposure), financial condition or corporate structure, we may be required to resubmit our capital plan to the Federal Reserve.

Our ability to accurately predict or explain the outcome of the CCAR process is influenced by evolving supervisory criteria. The Federal Reserve's annual assessment of our capital adequacy and planning process involves not only a quantitative assessment through the Federal Reserve's proprietary stress test models but also a qualitative assessment. The qualitative assessment involves a number of factors and is expected to continue to evolve on an ongoing basis as a result of the Federal Reserve's horizontal review of capital plan submissions. Similarly, the Federal Reserve may, as part of its stated goal to continually evolve its annual stress testing requirements, adjust several parameters of the annual stress testing process, including the severity of the stress test scenario and the addition of components deemed important by the Federal Reserve (e.g., a counterparty failure). Further, because the Federal Reserve's proprietary stress test models and qualitative assessment may differ from the modeling techniques and capital planning practices employed by us, it is foreseeable that our stress test results (using our own models, estimation methodologies and processes) may not be consistent with those disclosed by the Federal Reserve. In addition, the Federal Reserve may require, at some

point in the future, that some or all of the G-SIB surcharge or other buffers be integrated into its post-stress test minimum capital requirements.

The Federal Reserve's instructions for the 2018 CCAR provide that, for large BHCs like BNY Mellon, common stock dividend payout ratios exceeding 30% of after-tax net income available to common shareholders under certain baseline scenarios will receive particularly close scrutiny. A failure to increase dividends along with our competitors, or any reduction of, or elimination of, our common stock dividend would likely adversely affect the market price of our common stock, impact our return on equity and market perceptions of BNY Mellon.

Our ability to declare or pay dividends on, or purchase, redeem or otherwise acquire, shares of our common stock or any of our shares that rank junior to preferred stock as to the payment of dividends and/or the distribution of any assets on any liquidation, dissolution or winding-up of BNY Mellon will be prohibited, subject to certain exceptions, in the event that we do not declare and pay in full dividends for the then-current dividend period of our Series A preferred stock or the last preceding dividend period of our Series C, Series D, Series E or Series F preferred stock.

In addition, regulatory capital rules that are or will be applicable to us including the U.S. capital rules risk-based capital requirements, the SLR, enhanced SLR, the TLAC Rule and the U.S. G-SIB Rule may limit or otherwise restrict how we utilize our capital, including common stock dividends and stock repurchases, and may require us to increase or alter the mix of our outstanding regulatory capital instruments.

Any requirement to increase our regulatory capital ratios or alter the composition of our capital could require us to liquidate assets or otherwise change our business and/or investment plans, which may negatively affect our financial results. Further, any requirement to maintain higher levels of capital may constrain our ability to return capital to shareholders either in the form of common stock dividends or stock repurchases.

Changes in the method pursuant to which the LIBOR and other benchmark rates are determined could adversely impact our business and results of operations.

Our floating-rate funding, certain hedging transactions and certain of the products that we offer, such as floating-rate loans, financing transactions and derivatives in connection with our trading activities, determine the applicable interest rate or payment amount by reference to a benchmark rate, such as the London Interbank Offered Rate (“LIBOR”), or to an index, currency, basket or other financial metric. In the event any such benchmark or other referenced financial metric is significantly changed or discontinued (for example, if LIBOR is discontinued), there may be uncertainty as to the calculation of the applicable interest rate or payment amount, depending on the terms of the governing instrument. In addition, such changes could affect our exposure to fluctuations in interest rates (for example, if the discontinuation of LIBOR adversely affects the availability or cost of floating-rate funding), result in our hedges being ineffective or otherwise result in losses, additional costs or lower revenues.

The Parent is a non-operating holding company, and as a result, is dependent on dividends from its subsidiaries and extensions of credit from its IHC to meet its obligations, including with respect to its securities, and to provide funds for share repurchases and payment of dividends to its stockholders.

The Parent is a non-operating holding company, whose principal assets and sources of income are its principal U.S. bank subsidiaries - The Bank of New York Mellon and BNY Mellon, N.A. - and its other subsidiaries, including the IHC. The Parent is a legal entity separate and distinct from the IHC, as well as its banks and other subsidiaries. Therefore, the Parent primarily relies on dividends, interest, distributions, and other payments from its subsidiaries, including extensions of credit from the IHC, to meet its obligations, including its obligations with respect to its securities, and to provide funds for share repurchases and payment of common and preferred dividends to its stockholders, to the extent declared by the Board of Directors.

There are various limitations on the extent to which our bank and other subsidiaries can finance or

otherwise supply funds to the Parent (by dividend or otherwise) and certain of our affiliates. Each of these restrictions can reduce the amount of funds available to meet the Parent’s obligations. Many of our subsidiaries, including our bank subsidiaries, are subject to laws and regulations that restrict dividend payments or authorize regulatory bodies to block or reduce the flow of funds from those subsidiaries to the Parent or other subsidiaries. In addition, our bank subsidiaries would not be permitted to distribute a dividend if doing so would constitute an unsafe and unsound practice or if the payment would reduce their capital to an inadequate level. Our subsidiaries may also choose to restrict dividend payments to the Parent in order to increase their own capital or liquidity levels. For example, The Bank of New York Mellon, our primary subsidiary, did not distribute regular quarterly dividends to the Parent from the fourth quarter of 2015 to the second quarter of 2017 in order to build capital in advance of the implementation of the SLR as a binding measure. Our bank subsidiaries are also subject to restrictions on their ability to lend to or transact with non-bank affiliates, minimum regulatory capital and liquidity requirements, and restrictions on their ability to use funds deposited with them in bank or brokerage accounts to fund their businesses. See “Supervision and Regulation” and “Liquidity and dividends” and Note 17 of the Notes to Consolidated Financial Statements. Further, we evaluate and manage liquidity on a legal entity basis, which may place legal and other limitations on our ability to utilize liquidity from one legal entity to satisfy the liquidity requirements of another, including the Parent.

There are also limitations specific to the IHC’s ability to make distributions or extend credit to the Parent. The IHC is not permitted to pay dividends to the Parent if certain key capital, liquidity and operational risk indicators are breached, and if the resolution of the Parent is imminent, the committed lines of credit provided by the IHC to the Parent will automatically terminate, with all outstanding amounts becoming due. See “If our resolution plan is determined not to be credible or not to facilitate an orderly resolution under the U.S. Bankruptcy Code, our business, reputation, results of operations and financial condition could be materially negatively impacted. The application of our Title I preferred resolution strategy or resolution under the Title II orderly liquidation authority could adversely affect our liquidity and financial condition and our security holders.”

Because the Parent is a holding company, its rights and the rights of its creditors, including the holders of its securities, to a share of the assets of any subsidiary upon the liquidation or recapitalization of the subsidiary will be subject to the prior claims of the subsidiary's creditors (including, in the case of our banking subsidiaries, their depositors) except to the extent that the Parent may itself be a creditor with recognized claims against the subsidiary. The rights of holders of securities issued by the Parent to benefit from those distributions will also be junior to those prior claims. Consequently, securities issued by the Parent will be effectively subordinated to all existing and future liabilities of our subsidiaries.

Changes in accounting standards governing the preparation of our financial statements and future events could have a material impact on our reported financial condition, results of operations, cash flows and other financial data.

From time to time, the FASB, the SEC and bank regulators change the financial accounting and reporting standards governing the preparation of our financial statements or the interpretation of those standards. These changes are difficult to predict and can materially impact how we record and report our financial condition, results of operations, cash flows and other financial data. In some cases, we may be required to apply a new or revised standard

retroactively or to apply an existing standard differently, also retroactively, in each case potentially resulting in the restatement of our prior period financial statements and our related disclosures.

Additionally, our accounting policies and methods are fundamental to how we record and report our financial condition and results of operations. The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates based upon assumptions about future economic and market conditions which affect reported amounts and related disclosures in our financial statements. Amounts subject to estimates are items such as the allowance for loan losses and lending-related commitments, the fair value of financial instruments and derivatives, other-than-temporary impairment, goodwill and other intangibles and pension accounting. Among other effects, such changes in estimates could result in future impairments of investment securities, goodwill and intangible assets and establishment of allowances for loan losses and lending-related commitments as well as changes in pension and post-retirement expense. If subsequent events occur that are materially different than the assumptions and estimates we used, our reported financial condition, results of operation and cash flows may be materially negatively impacted. See "Recent Accounting Developments" for a discussion of recent developments to our accounting standards.

Recently issued accounting standards

The following ASUs issued by the Financial Accounting Standards Board (“FASB”) have not yet been adopted.

ASU 2017-12, Derivatives and Hedging: Targeted Improvements to Accounting for Hedging Activities

In August 2017, the FASB issued an ASU, *Derivatives and Hedging: Targeted Improvements to Accounting for Hedging Activities*. The objective of this ASU is to improve the financial reporting of hedging relationships to better portray the economic results of an entity’s risk management activities and to simplify the application of hedge accounting guidance.

The most significant impact of the new guidance to the Company relates to the new accounting alternatives for fair value hedges of interest rate risk, specifically, the ability to hedge only the benchmark component of the contractual cash flows and partial-term hedging. The guidance also changed presentation and disclosure requirements and made changes to how the shortcut method is applied, which may result in the Company using that method going forward for certain hedging relationships.

This ASU is effective for the first quarter of 2019, with early adoption permitted. Certain transition elections are available including the ability to reclassify certain debt securities from held-to-maturity to available-for-sale with any unrealized gain or loss at the transfer date being recorded in OCI and adjusting certain existing hedge relationships consistent with the newly simplified guidance. BNY Mellon is in the process of adopting this standard in the first quarter of 2018, effective as of Jan. 1, 2018. As part of that adoption we reclassified approximately \$1.1 billion of certain debt securities from held-to-maturity to available-for-sale and are assessing the impacts of other transition elections.

ASU 2017-07, Compensation-Retirement Benefits - Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost

In March 2017, the FASB issued an ASU, *Compensation-Retirement Benefits - Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. The ASU requires the disaggregation of the service cost

component from the other components of the net benefit cost in the income statement. The ASU also permits only the service cost component of net benefit cost to be eligible for capitalization. BNY Mellon adopted this ASU in the first quarter of 2018, and will apply the guidance retrospectively for the presentation of the service cost component and the other components in the income statement, and prospectively for the capitalization of the service cost component in assets. For information on the components of our pension and post-retirement health plan costs, see Note 16 of the Notes to Consolidated Financial Statements. Based on our current estimates for the net credit for pension and other post-retirement costs in 2018, the adoption of this standard will result in an increase to staff expense and a reduction in other expense, as compared to the currently reported amounts for 2017.

ASU 2016-18, Statement of Cash Flows – Restricted Cash

In November 2016, the FASB issued an ASU, *Statement of Cash Flows – Restricted Cash*. This ASU provides guidance on the presentation of restricted cash or restricted cash equivalents in the statement of cash flows. BNY Mellon adopted this ASU in the first quarter of 2018 and will include restricted cash (which totaled \$2 billion as of Dec. 31, 2017) with cash and due from banks when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows.

ASU 2016-15, Statement of Cash Flows – Classification of Certain Cash Receipts and Cash Payments

In August 2016, the FASB issued an ASU, *Statement of Cash Flows – Classification of Certain Cash Receipts and Cash Payments*. This ASU provides guidance on eight specific cash flow presentation issues. BNY Mellon adopted this guidance in the first quarter of 2018. BNY Mellon does not expect the adoption of this ASU will have a material impact on the statement of cash flows.

ASU 2014-09, Revenue from Contracts with Customers

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers*. This ASU, as amended, provides guidance on the recognition of

revenue related to the transfer of promised goods or services to customers, guidance on accounting for certain contract costs and additional disclosure requirements about revenue and contract costs. The standard supersedes most existing revenue recognition guidance and is effective for the first quarter of 2018 using either the retrospective or cumulative effect transition method upon adoption.

The Company has completed its evaluation of the potential impact of this guidance on our accounting policies, and based on that evaluation, the timing of most of our revenue recognition will remain the same and the impacts will not be material. The impacts primarily relate to deferring and amortizing certain sales commission costs related to obtaining customer contracts and the timing of recognizing the contra revenue related to certain payments made to customers. The Company adopted the guidance on Jan. 1, 2018 using the cumulative effect transition method, which resulted in an approximate \$55 million after-tax reduction to retained earnings. The Company is currently developing the disclosures required about revenue and contract costs and finalizing changes to internal control.

ASU 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities

In January 2016, the FASB issued ASU 2016-01, *Recognition and Measurement of Financial Assets and Financial Liabilities*. The ASU requires investments in equity securities that do not result in consolidation and are not accounted for under the equity method to be measured at fair value with changes in the fair value recognized through net income, unless one of two available exceptions apply. The first exception, a scope exception, allows Federal Reserve Bank stock, FHLB stock and other exchange memberships held by broker dealers to remain accounted for at cost, less impairment. The second exception, a practicability exception, will be available for equity investments that do not have readily determinable fair values and do not qualify for the practical expedient to estimate fair value under ASC 820, *Fair Value Measurement*. To the extent the practicability exception applies, such investments will be accounted for at cost adjusted for impairment, if any, plus or minus changes from observable price changes.

The amendments also require an entity to present separately in OCI the portion of the total change in

the fair value of a liability resulting from the entity's "own credit risk" when the entity has elected to measure the liability at fair value.

The amendments also eliminate the requirement to disclose the methods and significant assumptions used to estimate the fair values of financial instruments measured at amortized cost that are on the balance sheet.

The Company adopted this guidance in the first quarter of 2018 using the cumulative effect method of adoption, with a de minimis impact to retained earnings. As part of the adoption, we reclassified money market fund investments of approximately \$1.0 billion to trading assets, primarily from available-for-sale securities. BNY Mellon does not expect the adoption of this ASU to have a material ongoing impact to the financial statements.

Staff Accounting Bulletin No. 118

In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for tax effects of the U.S. tax legislation. SAB 118 allows the recording of a provisional estimate to reflect the income tax impact of the U.S. tax legislation and provides a measurement period up to one year from the enactment date to complete the accounting under ASC 740, *Income Taxes*. The Company recorded a \$710 million provisional tax benefit reflecting the impact of the U.S. tax legislation. For information on income taxes, see Note 10 of the Notes to Consolidated Financial Statements.

ASU 2016-02, Leases

In February 2016, the FASB issued ASU 2016-02, *Leases*. The primary objective of this ASU is to increase transparency and comparability by recognizing lease assets and liabilities on the balance sheet and expand related disclosures. ASU 2016-02 requires a "right-of-use" asset and a payment obligation liability on the balance sheet for most leases and subleases. Additionally, depending on the lease classification under the standard, it may result in different expense recognition patterns and classification than under existing accounting principles. For leases classified as finance leases, it

will result in higher expense recognition in the earlier periods and lower expense in the later periods of the lease.

The standard is effective for the first quarter of 2019, with early adoption permitted. Additionally, the standard allows for various optional practical expedients to assist with the implementation and reporting requirements. We are currently evaluating the potential impact of the leasing standard on our consolidated financial statements and evaluating the practical expedients that may be elected. Upon adoption, the implementation of the leasing standard is expected to result in an immaterial increase in both assets and liabilities.

ASU 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income

In February 2018, the FASB issued an ASU, *Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. This ASU permits a reclassification from accumulated other comprehensive income to retained earnings for the tax effects of items within accumulated other comprehensive income that do not reflect the lower statutory tax rate which was enacted by the U.S. tax legislation. This ASU is effective for the first quarter of 2019, with early adoption permitted. The guidance in this ASU will be applied retrospectively to the period in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Cuts and

Jobs Act is recognized. We are assessing the impacts of the new standard, but would not expect this ASU to have a material impact on BNY Mellon.

ASU 2016-13, Financial Instruments – Credit Losses

In June 2016, the FASB issued an ASU, *Financial Instruments – Credit Losses*. This ASU introduces a new current expected credit losses model, which will apply to financial assets subject to credit losses and measured at amortized cost, including held-to-maturity securities and certain off-balance sheet credit exposures. The guidance will also change current practice for the impairment model for available-for-sale debt securities. The available-for-sale debt securities model will require the use of an allowance to record estimated credit losses and subsequent recoveries. This ASU is effective for the first quarter of 2020. Earlier application is permitted beginning with the first quarter of 2019. BNY Mellon has begun its implementation efforts and is currently identifying key interpretive issues, and will assess existing credit loss forecasting models and processes against the new guidance to determine what modifications may be required. The extent of the impact to our financial statements upon adoption depends on several factors including the remaining expected life of financial instruments at the time of adoption, the establishment of an allowance for expected credit loss on held-to-maturity securities, and the macroeconomic conditions and forecasts that exist at that date.

We are prepared for events, such as information security incidents, technology disruptions, acts of terrorism, natural disasters, pandemics or global conflicts, that could damage our physical facilities, cause delay or disruptions to operational functions, including telecommunications networks, or impair our employees, clients, vendors and counterparties. Key elements of our business continuity strategies are extensive planning and testing, and diversity of business operations, data centers and telecommunications infrastructure.

We have established multiple geographically diverse locations for our funds transfer and broker-dealer services operational units, which provide redundant functionality to facilitate uninterrupted operations.

Our securities clearing, commercial paper, mutual fund accounting and custody, securities lending, master trust, Unit Investment Trust, corporate trust, item processing, wealth management and treasury units have common functionality in multiple sites designed to facilitate continuance of operations or rapid recovery. In addition, we have recovery seats for approximately 12,700 employees on a global basis of which over 6,300 are proprietary.

We continue to enhance geographic diversity for business operations by moving additional personnel to growth centers outside of existing major urban centers. We replicate 100% of our critical production computer data to recovery data centers.

We have an active telecommunications diversity program. All major buildings are provisioned with connectivity from diverse telecommunication carriers. Additionally, we design our critical connectivity to take advantage of separate carrier entrances built into our facilities. This maximizes resiliency by allowing for end to end separation of primary and alternative communications.

In 2003, the Federal Reserve, OCC and SEC jointly published the Interagency Paper, "Sound Practices to Strengthen the Resilience of the U.S. Financial System" ("Sound Practices Paper"). The purpose of the document was to define the guidelines for the

financial services industry and other interested parties regarding "best practices" related to business continuity planning. Under these guidelines, we are a key clearing and settlement organization required to meet a higher standard for business continuity.

We believe we meet substantially all of the requirements of the Sound Practices Paper. As a core clearing and settlement organization, we believe that we are at the forefront of the industry in improving business continuity practices.

We are committed to our service providers meeting the same standards that we do for business continuity, as well as for information security, financial stability, personnel practices and other measures. To that end, we have a Third Party Governance Program in place to review new and existing service providers to confirm their compliance with our standards.

We developed comprehensive plans, including increased remote working by staff for one or more periods lasting several weeks, to prepare for events that would cause significantly reduced staffing levels.

Although we are committed to observing best practices as well as meeting regulatory requirements, geopolitical uncertainties and other external factors will continue to create risk that cannot always be identified and anticipated.

Due to the nature of our business and our robust business recovery systems and processes, we are not materially impacted by climate change, nor do we expect material impacts in the near term. We have, and will continue to, implement processes and capital projects to deal with the risks of the changing climate. The Company has invested in the development of products and services that support the markets related to climate change.

Supplemental information - Explanation of GAAP and Non-GAAP financial measures

BNY Mellon has included in this Annual Report certain Non-GAAP financial measures based on estimated fully phased-in CET1 and other risk-based capital ratios, the estimated fully phased-in SLR and tangible common shareholders' equity. BNY Mellon believes that the CET1 and other risk-based capital ratios, on a fully phased-in basis and the SLR, on a fully phased-in basis, are measures of capital strength that provide additional useful information to investors, supplementing the capital ratios which are, or were, required by regulatory authorities. Tangible common shareholders' equity, which excludes goodwill and intangible assets, net of deferred tax liabilities, includes changes in investment securities valuations which are reflected in total shareholders' equity. BNY Mellon believes that the return on tangible common equity measure is an additional useful measure for investors because it presents a measure of those assets that can generate income. BNY Mellon has provided a measure of tangible book value per common share, which it believes provides additional useful information as to the level of tangible assets in relation to shares of common stock outstanding.

BNY Mellon has presented revenue measures, which exclude the effect of noncontrolling interests related to consolidated investment management funds and gains on the sales of our equity investment in Wing Hang and our One Wall Street building; and expense measures, which exclude amortization of intangible assets, M&I, litigation and restructuring charges, the (recovery) impairment charge related to Sentinel and the charge related to investment management funds, net of incentives. Operating margin and return on equity measures, which exclude some or all of these items, are also presented. Return on equity measures also exclude the tax benefit primarily related to a tax carryback claim and the net charge related to the disallowance of certain foreign tax credits. Operating margin measures may also exclude the provision for

credit losses and distribution and servicing expense. BNY Mellon believes that these measures are useful to investors because they permit a focus on period-to-period comparisons, which relate to the ability of BNY Mellon to enhance revenues and limit expenses in circumstances where such matters are within BNY Mellon's control. M&I expenses primarily relate to acquisitions and generally continue for approximately three years after the transaction. Litigation charges represent accruals for loss contingencies that are both probable and reasonably estimable, but exclude standard business-related legal fees. Restructuring charges relate to our streamlining actions and Operational Excellence Initiatives. Excluding the charges mentioned above permits investors to view expenses on a basis consistent with how management views the business.

The presentation of income from consolidated investment management funds, net of net income attributable to noncontrolling interests related to the consolidation of certain investment management funds, permits investors to view revenue on a basis consistent with how management views the business. BNY Mellon believes that these presentations, as a supplement to GAAP information, give investors a clearer picture of the results of its primary businesses.

The presentation of revenue growth on a constant currency basis permits investors to assess the significance of changes in foreign currency exchange rates. Growth rates on a constant currency basis were determined by applying the current period foreign currency exchange rates to the prior period revenue. BNY Mellon believes that this presentation, as a supplement to GAAP information, gives investors a clearer picture of the related revenue results without the variability caused by fluctuations in foreign currency exchange rates.

Each of these measures as described above is used by management to monitor financial performance, both on a company-wide and on a business-level basis.

Supplemental Information (unaudited) (continued)

The following table presents the reconciliation of the pre-tax operating margin ratio.

Pre-tax operating margin <i>(dollars in millions)</i>	2017	2016	2015	2014	2013
Income before income taxes – GAAP	\$ 4,610	\$ 4,725	\$ 4,235	\$ 3,563	\$ 3,777
Less: Net income attributable to noncontrolling interests of consolidated investment management funds	33	10	68	84	80
Gain on the sale of our equity investment in Wing Hang	—	—	—	490	—
Gain on the sale of our One Wall Street building	—	—	—	346	—
Add: Amortization of intangible assets	209	237	261	298	342
M&I, litigation and restructuring charges	106	49	85	1,130	70
(Recovery) impairment charge related to Sentinel	—	(13)	170	—	—
Charge related to investment management funds, net of incentives	—	—	—	104	12
Income before income taxes, as adjusted – Non-GAAP (a)	\$ 4,892	\$ 4,988	\$ 4,683	\$ 4,175	\$ 4,121
Fee and other revenue – GAAP	\$12,165	\$12,073	\$12,082	\$12,649	\$11,856
Income from consolidated investment management funds – GAAP	70	26	86	163	183
Net interest revenue – GAAP	3,308	3,138	3,026	2,880	3,009
Total revenue – GAAP	15,543	15,237	15,194	15,692	15,048
Less: Net income attributable to noncontrolling interests of consolidated investment management funds	33	10	68	84	80
Gain on the sale of our equity investment in Wing Hang	—	—	—	490	—
Gain on the sale of our One Wall Street building	—	—	—	346	—
Total revenue, as adjusted – Non-GAAP (a)	\$15,510	\$15,227	\$15,126	\$14,772	\$14,968
Pre-tax operating margin – GAAP (b)	30% (c)	31% (c)	28% (c)	23%	25%
Adjusted pre-tax operating margin – Non-GAAP (a)(b)	32% (c)	33% (c)	31% (c)	28%	28%

(a) Non-GAAP information for all periods presented excludes the net income attributable to noncontrolling interests of consolidated investment management funds, amortization of intangible assets and M&I, litigation and restructuring charges. Non-GAAP information for 2016 and 2015 also excludes the (recovery) impairment charge related to the Sentinel loan. Non-GAAP information for 2014 also excludes the gains on the sales of our equity investment in Wing Hang and our One Wall Street building. Non-GAAP information for 2014 and 2013 also excludes the charge related to investment management funds, net of incentives.

(b) Income before taxes divided by total revenue.

(c) Our GAAP earnings include tax-advantaged investments such as low income housing, renewable energy, corporate/bank-owned life insurance and tax-exempt securities. The benefits of these investments are primarily reflected in tax expense. If reported on a tax-equivalent basis, these investments would increase revenue and income before taxes by \$375 million for 2017, \$317 million for 2016 and \$242 million for 2015 and would increase our pre-tax operating margin by approximately 1.7% for 2017, 1.4% for 2016 and 1.1% for 2015.

The following table presents the reconciliation of book value per common share.

Book value per common share <i>(dollars in millions, unless otherwise noted)</i>	Dec. 31,				
	2017	2016	2015	2014	2013
BNY Mellon shareholders' equity at year end – GAAP	\$ 41,251	\$ 38,811	\$ 38,037	\$ 37,441	\$ 37,497
Less: Preferred stock	3,542	3,542	2,552	1,562	1,562
BNY Mellon common shareholders' equity at year end – GAAP	37,709	35,269	35,485	35,879	35,935
Less: Goodwill	17,564	17,316	17,618	17,869	18,073
Intangible assets	3,411	3,598	3,842	4,127	4,452
Add: Deferred tax liability – tax deductible goodwill (a)	1,034	1,497	1,401	1,340	1,302
Deferred tax liability – intangible assets (a)	718	1,105	1,148	1,216	1,222
BNY Mellon tangible common shareholders' equity at year end – Non-GAAP	\$ 18,486	\$ 16,957	\$ 16,574	\$ 16,439	\$ 15,934
Year-end common shares outstanding <i>(in thousands)</i>	1,013,442	1,047,488	1,085,343	1,118,228	1,142,250
Book value per common share – GAAP	\$ 37.21	\$ 33.67	\$ 32.69	\$ 32.09	\$ 31.46
Tangible book value per common share – Non-GAAP	\$ 18.24	\$ 16.19	\$ 15.27	\$ 14.70	\$ 13.95

(a) Deferred tax liabilities are based on fully phased-in Basel III capital rules. Deferred tax liabilities at Dec. 31, 2017 have been remeasured at the lower statutory corporate tax rate.

Supplemental Information (unaudited) (continued)

The following table presents the reconciliation of the returns on common equity and tangible common equity.

Return on common equity and tangible common equity <i>(dollars in millions)</i>	2017	2016	2015	2014	2013
Net income applicable to common shareholders of The Bank of New York Mellon Corporation – GAAP	\$ 3,915	\$ 3,425	\$ 3,053	\$ 2,494	\$ 2,040
Add: Amortization of intangible assets	209	237	261	298	342
Less: Tax impact of amortization of intangible assets	72	81	89	104	122
Adjusted net income applicable to common shareholders of The Bank of New York Mellon Corporation excluding amortization of intangible assets – Non-GAAP	4,052	3,581	3,225	2,688	2,260
Add: M&I, litigation and restructuring charges	106	49	85	1,130	70
(Recovery) impairment charge related to Sentinel	—	(13)	170	—	—
Tax impact of gain on the sale of our equity investment in Wing Hang	—	—	—	175	—
Tax impact of the gain on the sale of our One Wall Street building	—	—	—	142	—
Charge related to investment management funds, net of incentives	—	—	—	104	12
Net charge related to the disallowance of certain foreign tax credits	—	—	—	—	593
Less: Tax impact of M&I, litigation and restructuring charges	20	16	29	270	25
Tax impact of (recovery) impairment charge related to Sentinel	—	(5)	64	—	—
Gain on the sale of our equity investment in Wing Hang	—	—	—	490	—
Gain on the sale of our One Wall Street building	—	—	—	346	—
Tax impact of charge related to investment management funds, net of incentives	—	—	—	23	3
Benefit primarily related to a tax carryback claim	—	—	—	150	—
Adjusted net income applicable to common shareholders of The Bank of New York Mellon Corporation, as adjusted – Non-GAAP (a)	\$ 4,138	\$ 3,606	\$ 3,387	\$ 2,960	\$ 2,907
Average common shareholders' equity	\$ 36,145	\$ 35,504	\$ 35,564	\$ 36,618	\$ 34,832
Less: Average goodwill	17,441	17,497	17,731	18,063	17,988
Average intangible assets	3,508	3,737	3,992	4,305	4,619
Add: Deferred tax liability – tax deductible goodwill (b)	1,034	1,497	1,401	1,340	1,302
Deferred tax liability – intangible assets (b)	718	1,105	1,148	1,216	1,222
Average tangible common shareholders' equity – Non-GAAP	\$ 16,948	\$ 16,872	\$ 16,390	\$ 16,806	\$ 14,749
Return on common shareholders' equity – GAAP	10.8%	9.6%	8.6%	6.8%	5.9%
Adjusted return on common shareholders' equity – Non-GAAP (a)	11.4%	10.2%	9.5%	8.1%	8.3%
Return on tangible common shareholders' equity – Non-GAAP	23.9%	21.2%	19.7%	16.0%	15.3%
Adjusted return on tangible common shareholders' equity – Non-GAAP (a)	24.4%	21.4%	20.7%	17.6%	19.7%

(a) Non-GAAP information for all periods presented excludes the amortization of intangible assets and M&I, litigation and restructuring charges. Non-GAAP information for 2016 and 2015 also excludes the (recovery) impairment charge related to the Sentinel loan. Non-GAAP information for 2014 also excludes the gains on the sales of our equity investment in Wing Hang and our One Wall Street building, the charge related to investment management funds, net of incentives, and the benefit primarily related to a tax carryback claim. Non-GAAP information for 2013 also excludes the charge related to investment management funds, net of incentives and the net charge related to the disallowance of certain foreign tax credits.

(b) Deferred tax liabilities are based on fully phased-in Basel III capital rules. Deferred tax liabilities at Dec. 31, 2017 have been remeasured at the lower statutory corporate tax rate.

The following table presents income from consolidated investment management funds, net of noncontrolling interests.

Income from consolidated investment management funds, net of noncontrolling interests <i>(in millions)</i>	2017	2016	2015	2014	2013
Income from consolidated investment management funds	\$ 70	\$ 26	\$ 86	\$ 163	\$ 183
Less: Net income attributable to noncontrolling interests of consolidated investment management funds	33	10	68	84	80
Income from consolidated investment management funds, net of noncontrolling interests	\$ 37	\$ 16	\$ 18	\$ 79	\$ 103

Supplemental Information (unaudited) (continued)

The following table presents the impact of changes in foreign currency exchange rates on our consolidated investment management and performance fees.

Investment management and performance fees – Consolidated <i>(dollars in millions)</i>	2017	2016	2017 vs. 2016
Investment management and performance fees – GAAP	\$ 3,584	\$ 3,350	7%
Impact of changes in foreign currency exchange rates	—	(29)	
Investment management and performance fees, as adjusted – Non-GAAP	\$ 3,584	\$ 3,321	8%

The following table presents the revenue line items in the Investment Management business impacted by the consolidated investment management funds.

Income from consolidated investment management funds, net of noncontrolling interests - Investment Management business <i>(in millions)</i>	2017	2016	2015
Investment management fees	\$ 5	\$ 11	\$ 15
Other (Investment income)	32	5	3
Income from consolidated investment management funds, net of noncontrolling interests	\$ 37	\$ 16	\$ 18

The following table presents the impact of changes in foreign currency exchange rates on investment management fees reported in the Investment Management business.

Investment management fees - Investment Management business <i>(dollars in millions)</i>	2017	2016	2017 vs. 2016
Investment management fees – GAAP	\$ 3,428	\$ 3,232	6%
Impact of changes in foreign currency exchange rates	—	(28)	
Investment management fees, as adjusted – Non-GAAP	\$ 3,428	\$ 3,204	7%

The following table presents the reconciliation of the pre-tax operating margin for the Investment Management business.

Pre-tax operating margin - Investment Management business <i>(dollars in millions)</i>	2017	2016	2015
Income before income taxes – GAAP	\$ 1,141	\$ 967	\$ 1,048
Add: Amortization of intangible assets	60	82	97
Provision for credit losses	2	6	(1)
Adjusted income before income taxes, excluding amortization of intangible assets and provision for credit losses – Non-GAAP	\$ 1,203	\$ 1,055	\$ 1,144
Total revenue – GAAP	\$ 3,997	\$ 3,751	\$ 3,906
Less: Distribution and servicing expense	422	404	378
Adjusted total revenue, net of distribution and servicing expense – Non-GAAP	\$ 3,575	\$ 3,347	\$ 3,528
Pre-tax operating margin – GAAP (a)	29%	26%	27%
Adjusted pre-tax operating margin, excluding amortization of intangible assets, provision for credit losses and distribution and servicing expense – Non-GAAP (a)	34%	32%	32%

(a) *Income before taxes divided by total revenue.*

Rate/volume analysis

Rate/volume analysis (a)	2017 over (under) 2016			2016 over (under) 2015		
	Due to change in			Due to change in		
	Average balance	Average rate	Net change	Average balance	Average rate	Net change
<i>(dollar amounts in millions, presented on an FTE basis)</i>						
Interest revenue						
Interest-earning assets:						
Interest-bearing deposits with banks (primarily foreign banks)	\$ 1	\$ 15	\$ 16	\$ (34)	\$ 34	\$ —
Interest-bearing deposits with the Federal Reserve and other central banks	(28)	149	121	(5)	33	28
Federal funds sold and securities purchased under resale agreements	14	176	190	16	70	86
Margin loans	(62)	140	78	(19)	77	58
Non-margin loans:						
Domestic offices:						
Consumer	33	6	39	41	1	42
Commercial	(17)	121	104	40	31	71
Foreign offices	(4)	65	61	(10)	43	33
Total non-margin loans	12	192	204	71	75	146
Securities:						
U.S. government obligations	9	38	47	(13)	13	—
U.S. government agency obligations	71	138	209	23	(4)	19
State and political subdivisions - tax exempt	(15)	5	(10)	(28)	10	(18)
Other securities:						
Domestic offices	(62)	67	5	(44)	(48)	(92)
Foreign offices	(11)	(45)	(56)	(18)	48	30
Total other securities	(73)	22	(51)	(62)	—	(62)
Trading securities (primarily domestic)	(1)	—	(1)	(12)	(3)	(15)
Total securities	(9)	203	194	(92)	16	(76)
Total interest revenue	\$ (72)	\$ 875	\$ 803	\$ (63)	\$ 305	\$ 242
Interest expense						
Interest-bearing liabilities:						
Interest-bearing deposits:						
Domestic offices:						
Money market rate accounts	\$ —	\$ —	\$ —	\$ —	\$ (2)	\$ (2)
Savings	(1)	4	3	—	—	—
Demand deposits	8	(1)	7	—	1	1
Time deposits	(8)	64	56	—	12	12
Total domestic offices	(1)	67	66	—	11	11
Foreign offices:						
Banks	—	50	50	(2)	4	2
Government and official institutions	—	9	9	—	—	—
Other	3	18	21	—	(34)	(34)
Total foreign offices	3	77	80	(2)	(30)	(32)
Total interest-bearing deposits	2	144	146	(2)	(19)	(21)
Federal funds purchased and securities sold under repurchase agreements	17	172	189	—	42	42
Trading liabilities	4	(3)	1	1	(4)	(3)
Other borrowed funds:						
Domestic offices:						
Domestic offices	20	(3)	17	(2)	2	—
Foreign offices	—	1	1	1	(2)	(1)
Total other borrowed funds	20	(2)	18	(1)	—	(1)
Commercial paper	8	16	24	—	3	3
Payables to customers and broker-dealers	2	50	52	4	1	5
Long-term debt	69	138	207	32	80	112
Total interest expense	\$ 122	\$ 515	\$ 637	\$ 34	\$ 103	\$ 137
Changes in net interest revenue	\$ (194)	\$ 360	\$ 166	\$ (97)	\$ 202	\$ 105

(a) Changes which are solely due to balance changes or rate changes are allocated to such categories on the basis of the respective percentage changes in average balances and average rates. Changes in interest revenue or interest expense arising from the combination of rate and volume variances are allocated proportionately to rate and volume based on their relative absolute magnitudes.

Selected Quarterly Data (unaudited)

Selected Quarterly Data <i>(dollar amounts in millions, except per share amounts)</i>	Quarter ended							
	2017				2016			
	Dec. 31	Sept. 30	June 30	March 31	Dec. 31	Sept. 30	June 30	March 31
Consolidated income statement								
Total fee and other revenue	\$ 2,860	\$ 3,167	\$ 3,120	\$ 3,018	\$ 2,954	\$ 3,150	\$ 2,999	\$ 2,970
Income (loss) from consolidated investment management funds	17	10	10	33	5	17	10	(6)
Net interest revenue	851	839	826	792	831	774	767	766
Total revenue	3,728	4,016	3,956	3,843	3,790	3,941	3,776	3,730
Provision for credit losses	(6)	(6)	(7)	(5)	7	(19)	(9)	10
Noninterest expense	3,006	2,654	2,655	2,642	2,631	2,643	2,620	2,629
Income before taxes	728	1,368	1,308	1,206	1,152	1,317	1,165	1,091
(Benefit) provision for income taxes	(453)	348	332	269	280	324	290	283
Net income	1,181	1,020	976	937	872	993	875	808
Net (income) loss attributable to noncontrolling interests	(6)	(2)	(1)	(15)	(2)	(6)	(2)	9
Net income applicable to shareholders of The Bank of New York Mellon Corporation	1,175	1,018	975	922	870	987	873	817
Preferred stock dividends	(49)	(35)	(49)	(42)	(48)	(13)	(48)	(13)
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	\$ 1,126	\$ 983	\$ 926	\$ 880	\$ 822	\$ 974	\$ 825	\$ 804
Basic earnings per common share	\$ 1.09	\$ 0.94	\$ 0.88	\$ 0.83	\$ 0.77	\$ 0.90	\$ 0.76	\$ 0.73
Diluted earnings per common share	1.08	0.94	0.88	0.83	0.77	0.90	0.75	0.73
Average balances								
Interest-bearing deposits with banks	\$ 89,029	\$ 86,329	\$ 84,148	\$ 80,757	\$ 77,119	\$ 88,168	\$ 112,182	\$ 104,001
Securities	120,225	119,089	117,227	114,786	117,660	118,405	118,002	118,538
Trading securities	2,723	2,359	2,455	2,254	2,288	2,176	2,152	3,320
Loans	56,772	55,944	58,793	60,312	63,647	61,578	60,284	61,196
Total interest-earning assets	297,166	291,841	289,496	283,421	287,947	296,703	318,433	310,678
Assets of operations	350,129	344,966	341,607	335,080	343,138	350,190	372,974	363,245
Total assets	350,786	345,709	342,515	336,200	344,142	351,230	374,220	364,554
Deposits	216,874	212,658	216,222	213,375	227,948	236,728	249,155	244,961
Long-term debt	28,245	28,138	27,398	25,882	24,986	23,930	22,838	21,556
Preferred stock	3,542	3,542	3,542	3,542	3,542	3,284	2,552	2,552
Total The Bank of New York Mellon Corporation common shareholders' equity	36,952	36,780	35,862	34,965	35,171	35,767	35,827	35,252
Net interest margin	1.14%	1.15%	1.14%	1.13%	1.16%	1.05%	0.97%	0.99%
Annualized return on common equity (a)	12.1%	10.6%	10.4%	10.2%	9.3%	10.8%	9.3%	9.2%
Pre-tax operating margin	20%	34%	33%	31%	30%	33%	31%	29%
Common stock data (a)								
Market price per share range:								
High	\$ 55.40	\$ 54.59	\$ 51.59	\$ 48.96	\$ 49.54	\$ 42.02	\$ 42.61	\$ 40.29
Low	50.53	50.15	45.89	43.85	38.68	36.50	35.44	32.20
Average	53.27	52.48	47.83	46.77	45.10	39.94	39.78	36.26
Period end close	53.86	53.02	51.02	47.23	47.38	39.88	38.85	36.83
Cash dividends per common share	0.24	0.24	0.19	0.19	0.19	0.19	0.17	0.17
Market capitalization (b)	54,584	54,294	52,712	49,113	49,630	42,167	41,479	39,669

(a) At Dec. 31, 2017, there were 29,472 shareholders registered with our stock transfer agent, compared with 28,015 at Dec. 31, 2016 and 29,136 at Dec. 31, 2015. In addition, there were 45,015 of BNY Mellon's current and former employees at Dec. 31, 2017 who participate in BNY Mellon's 401(k) Retirement Savings Plan. All shares of BNY Mellon's common stock held by the Plan for its participants are registered in the name of The Bank of New York Mellon Corporation, as trustee.

(b) At period end.

Some statements in this document are forward-looking. These include all statements about the usefulness of Non-GAAP measures, the future results of BNY Mellon, our businesses, financial, liquidity and capital condition, results of operations, liquidity and capital management and processes, goals, strategies, outlook, objectives, expectations (including those regarding our performance results, regulatory, technology, market, economic or accounting developments, legal proceedings and other contingencies, effective tax rate, estimates (including those regarding capital ratios), intentions (including those regarding our resolution strategy), targets, opportunities and initiatives.

In this report, any other report, any press release or any written or oral statement that BNY Mellon or its executives may make, words, such as “estimate,” “forecast,” “project,” “anticipate,” “likely,” “target,” “expect,” “intend,” “continue,” “seek,” “believe,” “plan,” “goal,” “could,” “should,” “would,” “may,” “might,” “will,” “strategy,” “synergies,” “opportunities,” “trends,” “future” and words of similar meaning, may signify forward-looking statements.

Actual results may differ materially from those expressed or implied as a result of a number of factors, including those discussed in the “Risk Factors,” such as: a communications or technology disruption or failure that results in a loss of information or impacts our ability to provide services to our clients may materially adversely affect our business, financial condition and results of operations; a cybersecurity incident, or a failure to protect our computer systems, networks and information and our clients’ information against cybersecurity threats, could result in a loss of information, adversely impact our ability to conduct our businesses, and damage our reputation and cause losses; our business may be materially adversely affected by operational risk; failure to satisfy regulatory standards, including “well capitalized” and “well managed” status or capital adequacy and liquidity rules more generally, could result in limitations on our activities and adversely affect our business and financial condition; we are subject to extensive government rulemaking, regulation and supervision; these rules and regulations have, and in the future may, compel us to change how we manage our businesses, which could have a material adverse effect on our business, financial condition and results of operations; rules and regulations have increased

our compliance and operational risk and costs; our risk management framework may not be effective in mitigating risk and reducing the potential for losses; a failure or circumvention of our controls and procedures could have a material adverse effect on our business, reputation, results of operations and financial condition; if our resolution plan is determined not to be credible or not to facilitate an orderly resolution under the U.S. Bankruptcy Code, our business, reputation, results of operations and financial condition could be materially negatively impacted; the application of our Title I preferred resolution strategy or resolution under the Title II orderly liquidation authority could adversely affect our liquidity and financial condition and our security holders; regulatory or enforcement actions or litigation could materially adversely affect our results of operations or harm our businesses or reputation; our businesses may be negatively affected by adverse events, publicity, government scrutiny or other reputational harm; acts of terrorism, natural disasters, pandemics, global conflicts and other geopolitical events may have a negative impact on our business and operations; we are dependent on fee-based business for a substantial majority of our revenue and our fee-based revenues could be adversely affected by slowing in market activity, weak financial markets, underperformance and/or negative trends in savings rates or in investment preferences; weakness and volatility in financial markets and the economy generally may materially adversely affect our business, results of operations and financial condition; the United Kingdom’s referendum decision to leave the EU has had and may continue to have negative effects on global economic conditions, global financial markets, and our business and results of operations; changes in interest rates and yield curves could have a material adverse effect on our profitability; we may experience write-downs of securities that we own and other losses related to volatile and illiquid market conditions, reducing our earnings and impacting our financial condition; ongoing concerns about the financial stability of certain countries, new barriers to global trade or a breakup of the EU or Eurozone could have a material adverse effect on our business and results of operations; our FX revenue may be adversely affected by decreases in market volatility and the cross-border investment activity of our clients; the failure or perceived weakness of any of our significant counterparties, many of whom are major financial institutions and sovereign entities, and our assumption of credit and counterparty risk, could

expose us to loss and adversely affect our business; our business, financial condition and results of operations could be adversely affected if we do not effectively manage our liquidity; any material reduction in our credit ratings or the credit ratings of our principal bank subsidiaries, The Bank of New York Mellon or BNY Mellon, N.A., could increase the cost of funding and borrowing to us and our rated subsidiaries and have a material adverse effect on our results of operations and financial condition and on the value of the securities we issue; we could incur losses if our allowance for credit losses, including loan and lending related commitments reserves, is inadequate; new lines of business, new products and services or transformational or strategic project initiatives may subject us to additional risks, and the failure to implement these initiatives could affect our results of operations; we are subject to competition in all aspects of our business, which could negatively affect our ability to maintain or increase our profitability; our business may be adversely affected if we are unable to attract and retain employees; our strategic transactions present risks and uncertainties and could have an adverse effect on our business, results of operations and financial condition; tax law changes, including the recent enactment of the Tax Act, or challenges to our tax positions with respect to historical transactions may adversely affect our net income, effective tax rate and our overall results of operations and financial condition; our ability to return capital to shareholders is subject to the discretion of our board of directors and may be

limited by U.S. banking laws and regulations, including those governing capital and the approval of our capital plan, applicable provisions of Delaware law or our failure to pay full and timely dividends on our preferred stock; changes in the method pursuant to which the LIBOR and other benchmark rates are determined could adversely impact our business and results of operations; the Parent is a non-operating holding company, and as a result, is dependent on dividends from its subsidiaries and extensions of credit from its IHC to meet its obligations, including with respect to its securities, and to provide funds for share repurchases and payment of dividends to its stockholders; changes in accounting standards governing the preparation of our financial statements and future events could have a material impact on our reported financial condition, results of operations, cash flows and other financial data.

Investors should consider all risk factors discussed in our 2017 Annual Report and any subsequent reports filed with the SEC by BNY Mellon pursuant to the Exchange Act. All forward-looking statements speak only as of the date on which such statements are made, and BNY Mellon undertakes no obligation to update any statement to reflect events or circumstances after the date on which such forward-looking statement is made or to reflect the occurrence of unanticipated events. The contents of BNY Mellon's website or any other websites referenced herein are not part of this report.

Acronyms

ABS	Asset-backed security	LCR	Liquidity coverage ratio
APAC	Asia-Pacific region	LTD	External eligible long-term debt
ASC	Accounting Standards Codification	M&I	Merger and integration
ASU	Accounting Standards Update	MBS	Mortgage-backed security
AUC/A	Assets under custody and/or administration	MMF	Money market funds
AUM	Assets under management	N/A	Not applicable or Not available
BCBS	Basel Committee on Banking Supervision	NAV	Net asset value
BHCs	Bank holding companies	N/M	Not meaningful
bps	basis points	NSFR	Net stable funding ratio
CCAR	Comprehensive Capital Analysis and Review	NYSE	New York Stock Exchange
CD	Certificates of deposit	OCC	Office of the Comptroller of the Currency
CET1	Common Equity Tier 1 capital	OCI	Other comprehensive income
CFTC	Commodity Futures Trading Commission	OTC	Over-the-counter
CLO	Collateralized loan obligation	OTTI	Other-than-temporary impairment
CVA	Credit valuation adjustment	PRA	Prudential Regulation Authority
DVA	Debit valuation adjustment	PSUs	Performance units
EMEA	Europe, the Middle East and Africa	REIT	Real estate investment trust
ERISA	Employee Retirement Income Security Act of 1974	RMBS	Residential mortgage-backed security
ESOP	Employee Stock Ownership Plan	RSUs	Restricted stock units
EVE	Economic Value of Equity	RWAs	Risk-weighted assets
FASB	Financial Accounting Standards Board	S&P	Standard & Poor's
FCA	Financial Conduct Authority	SBIC	Small Business Investment Company
FDIC	Federal Deposit Insurance Corporation	SBLC	Standby letters of credit
FHC	Financial holding company	SEC	Securities and Exchange Commission
FINRA	Financial Industry Regulatory Authority, Inc.	SIFIs	Systemically important financial institutions
FTE	Fully taxable equivalent	SLR	Supplementary Leverage Ratio
GAAP	Generally accepted accounting principles	TDR	Troubled debt restructuring
G-SIBs	Global systemically important banks	TLAC	Total loss-absorbing capacity
HQLA	High-quality liquid assets	VaR	Value-at-risk
IHC	Intermediate Holding Company	VIE	Variable interest entity
LIBOR	London Interbank Offered Rate	VME	Voting model entity

Accumulated benefit obligation - The actuarial present value of benefits (vested and non-vested) attributed to employee services rendered.

Alt-A securities - A mortgage risk categorization that falls between prime and subprime. Borrowers behind these mortgages will typically have clean credit histories but the mortgage itself will generally have issues that increase its risk profile.

Alternative investments - Usually refers to investments in hedge funds, leveraged loans, subordinated and distressed debt, real estate and foreign currency overlay. Examples of alternative investment strategies are: long-short equity, event-driven, statistical arbitrage, fixed-income arbitrage, convertible arbitrage, short bias, global macro and equity market neutral.

Asset-backed security (“ABS”) - A financial security backed by a loan, lease or receivables against assets other than real estate and mortgage-backed securities.

Assets under custody and/or administration (“AUC/A”) - Assets that we hold directly or indirectly on behalf of clients under a safekeeping or custody arrangement or for which we provide administrative services for clients. The following types of assets under administration are not and historically have not been included in AUC/A: performance and risk analytics, transfer agency and asset aggregation services. To the extent that we provide more than one AUC/A service for a client’s assets, the value of the asset is only counted once in the total amount of AUC/A.

Assets under management (“AUM”) - Includes assets beneficially owned by our clients or customers which we hold in various capacities that are either actively or passively managed, as well as the value of hedges supporting customer liabilities. These assets and liabilities are not on our balance sheet.

CAMELS - An international bank-rating system where bank supervisory authorities rate institutions according to six factors. The six factors are Capital adequacy, Asset quality, Management quality, Earnings, Liquidity and Sensitivity to Market Risk.

Collateral management - A comprehensive program designed to simplify collateralization and expedite securities transfers for buyers and sellers.

Collateralized loan obligation (“CLO”) - A debt security backed by a pool of commercial loans.

Collective trust fund - An investment fund formed from the pooling of investments by investors.

Common Equity Tier 1 capital (“CET1”) - The sum of surplus (net of treasury stock), retained earnings, accumulated other comprehensive income (loss), and common equity Tier 1 minority interest subject to certain limitations, minus certain regulatory adjustments and deductions.

Counterparty risk (default risk) - The risk that a counterparty will not pay as obligated on a contract, trade or transaction.

Credit derivatives - Contractual agreements that provide insurance against a credit event of one or more referenced credits. Such events include bankruptcy, insolvency and failure to meet payment obligations when due.

Credit risk - The risk of loss due to borrower or counterparty default.

Credit valuation adjustment (“CVA”) - The market value of counterparty credit risk on OTC derivative transactions.

Currency swaps - An agreement to exchange stipulated amounts of one currency for another currency.

Debit valuation adjustment (“DVA”) - The market value of our credit risk on OTC derivative transactions.

Depository Receipts - A negotiable security that generally represents a non-U.S. company’s publicly traded equity.

Derivative - A contract or agreement whose value is derived from changes in interest rates, foreign exchange rates, prices of securities or commodities, credit worthiness for credit default swaps or financial or commodity indices.

Earnings allocated to participating securities - Amount of undistributed earnings, after payment of taxes, preferred stock dividends and the required adjustment for common stock dividends declared, that is allocated to securities that are eligible to receive a portion of the Company’s earnings.

Economic capital - the amount of capital required to absorb potential losses and reflects the probability of remaining solvent with a target debt rating over a one-year time horizon.

Economic value of equity (“EVE”) - An aggregation of discounted future cash flows of assets and liabilities over a long-term horizon.

Eurozone - Formed by European Union Member States whose currency is the euro (€) and in which a single monetary policy is conducted under the responsibility of the Governing Council of the European Central Bank. The Eurozone currently includes Germany, France, Belgium, the Netherlands, Luxembourg, Austria, Finland, Italy, Ireland, Spain, Portugal, Greece, Estonia, Cyprus, Malta, Slovenia, Slovakia, Latvia and Lithuania.

Fiduciary risk - The risk arising from our role as trustee, executor, investment agent or guardian in accordance with governing documents, prudent person principles and applicable laws, rules and regulations.

Foreign currency options - Similar to interest rate options except they are based on foreign exchange rates. Also, see interest rate options in this glossary.

Foreign currency swaps - An agreement to exchange stipulated amounts of one currency for another currency at one or more future dates.

Foreign exchange contracts - Contracts that provide for the future receipt or delivery of foreign currency at previously agreed-upon terms.

Forward rate agreements - Contracts to exchange payments on a specified future date, based on a market change in interest rates from trade date to contract settlement date.

Fully taxable equivalent (“FTE”) - Basis for comparison of yields on assets having ordinary taxability with assets for which special tax exemptions apply. The FTE adjustment reflects an increase in the interest yield or return on a tax-exempt asset to a level that would be comparable had the asset been fully taxable.

Generally accepted accounting principles (“GAAP”) - Accounting rules and conventions defining acceptable practices in preparing financial statements in the U.S. The FASB is the primary source of accounting rules.

Grantor Trust - A legal, passive entity through which pass-through securities are sold to investors.

Hedge fund - A fund which is allowed to use diverse strategies that are unavailable to mutual funds, including selling short, leverage, program trading, swaps, arbitrage and derivatives.

High-quality liquid assets (“HQLA”) - Unencumbered assets of the types identified in the U.S. LCR rule, which the U.S. banking agencies describe as able to be convertible into cash with little or no expected loss of value during a period of liquidity stress.

Impairment - When an asset’s market value is less than its carrying value.

Interest rate options - Contracts to modify interest rate risk in exchange for the payment of a premium when the contract is initiated. As a writer of interest rate options, we receive a premium in exchange for bearing the risk of unfavorable changes in interest rates. Conversely, as a purchaser of an option, we pay a premium for the right, but not the obligation, to buy or sell a financial instrument or currency at predetermined terms in the future.

Interest rate sensitivity - The exposure of net interest income to interest rate movements.

Interest rate swaps - Contracts in which a series of interest rate flows in a single currency are exchanged over a prescribed period. Interest rate swaps are the most common type of derivative contract that we use in our asset/liability management activities.

Investment grade - Represents Moody’s long-term rating of Baa3 or better; and/or a Standard & Poor’s, Fitch or DBRS long-term rating of BBB- or better; or if unrated, an equivalent rating using our internal risk ratings. Instruments that fall below these levels are considered to be non-investment grade.

Joint venture - A company or entity owned and operated by a group of companies for a specific business purpose, no one of which has a majority interest.

Leverage ratio - Tier 1 capital divided by quarterly average total assets, as defined by the regulators.

Liquidity coverage ratio (“LCR”) - A Basel III framework requirement for banks and BHCs to measure liquidity. It is designed to ensure that certain banking organizations, including BNY Mellon, maintain a minimum amount of unencumbered HQLA sufficient to withstand the net cash outflow under a hypothetical standardized acute liquidity stress scenario for a 30-day time horizon.

Litigation risk - Arises when, in the ordinary course of business, we are named as defendants or made parties to legal actions.

Master netting agreement - An agreement between two counterparties that have multiple contracts with each other that provides for the net settlement of all contracts through a single payment in the event of default or termination of any one contract.

Mortgage-backed security (“MBS”) - An asset-backed security whose cash flows are backed by the principal and interest payments of a set of mortgage loans.

Net interest margin - The result of dividing net interest revenue by average interest-earning assets.

Other-than-temporary impairment (“OTTI”) - An impairment charge taken on a security whose fair value has fallen below the carrying value on the balance sheet and its value is not expected to recover through the holding period of the security.

Performance fees - Fees received by an investment advisor based upon the fund’s performance for the period relative to various predetermined benchmarks.

Pre-tax operating margin - Income before taxes for a period divided by total revenue for that period.

Prime securities - A classification of securities collateralized by loans to borrowers who have a high-value and/or a good credit history.

Private equity/venture capital - Investment in start-up companies or those in the early processes of developing products and services with perceived, long-term growth potential.

Projected benefit obligation - The actuarial present value of all benefits accrued on employee service rendered prior to the calculation date, including allowance for future salary increases if the pension benefit is based on future compensation levels.

Rating agency - An independent agency that assesses the credit quality and likelihood of default of an issue or issuer and assigns a rating to that issue or issuer.

Real estate investment trust (“REIT”) - An investor-owned corporation, trust or association that sells shares to investors and invests in income-producing property.

Repurchase agreement (“Repo”) - An instrument used to raise short term funds whereby securities are sold with an agreement for the seller to buy back the securities at a later date.

Reputational risk - Arises when events or actions that negatively impact our reputation lead to a loss of existing clients and could make it more challenging to acquire new business.

Residential mortgage-backed security (“RMBS”) - An asset-backed security whose cash flows are backed by principal and interest payments of a set of residential mortgage loans.

Restructuring charges - Typically result from the consolidation and/or relocation of operations.

Return on average assets - Net income applicable to common shareholders divided by average assets.

Return on common equity - Net income applicable to common shareholders divided by average common shareholders’ equity.

Return on tangible common equity - Net income applicable to common shareholders, excluding amortization of intangible assets, divided by average tangible common shareholders’ equity.

Securities lending transaction - A fully collateralized transaction in which the owner of a security agrees to lend the security through an agent (such as The Bank of New York Mellon) to a borrower, usually a broker-dealer or bank, on an open, overnight or term basis, under the terms of a prearranged contract, which generally matures in less than 90 days.

Sub-custodian - A local provider (e.g., a bank) contracted to provide specific custodial-related services in a selected country or geographic area.

Subprime securities - A classification of securities collateralized by loans to borrowers who have a tarnished or limited credit history.

Supplementary Leverage Ratio (“SLR”) - An Advanced Approach banking organization’s Basel III SLR is the simple arithmetic mean of the ratio of its Tier 1 capital to total leverage exposure (which is broadly defined to capture both on- and off-balance sheet exposures).

Tangible common shareholders’ equity - Common equity less goodwill and intangible assets adjusted for deferred tax liabilities associated with non-tax deductible intangible assets and tax deductible goodwill.

Unfunded commitments - Legally binding agreements to provide a defined level of financing until a specified future date.

Value-at-risk (“VaR”) - A measure of the dollar amount of potential loss in value due to adverse market movements over a defined time horizon with a specified confidence level.

Variable interest entity (“VIE”) - An entity that: (1) lacks enough equity investment at risk to permit the entity to finance its activities without additional financial support from other parties; (2) has equity owners that lack the right to make significant decisions affecting the entity’s operations; and/or (3) has equity owners that do not have an obligation to absorb, or the right to receive, the entity’s losses or returns.

Management of BNY Mellon is responsible for establishing and maintaining adequate internal control over financial reporting for BNY Mellon, as such term is defined in Rule 13a-15(f) under the Exchange Act.

BNY Mellon's management, including its principal executive officer and principal financial officer, has assessed the effectiveness of BNY Mellon's internal control over financial reporting as of December 31, 2017. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control - Integrated Framework (2013). Based upon such assessment, management believes that, as of December 31, 2017, BNY Mellon's internal control over financial reporting is effective based upon those criteria.

KPMG LLP, the independent registered public accounting firm that audited BNY Mellon's 2017 financial statements included in this Annual Report under "Financial Statements and Notes," has issued a report with respect to the effectiveness of BNY Mellon's internal control over financial reporting. This report appears on page 132.

To the Stockholders and Board of Directors
The Bank of New York Mellon Corporation:

Opinion on Internal Control Over Financial Reporting

We have audited The Bank of New York Mellon Corporation and subsidiaries' (BNY Mellon) internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, BNY Mellon maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, 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 sheets of BNY Mellon as of December 31, 2017 and 2016, the related consolidated statements of income, comprehensive income, changes in equity, and cash flows for each of the years in the three-year period ended December 31, 2017, and the related notes (collectively, the consolidated financial statements), and our report dated February 28, 2018 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

BNY Mellon'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 Report of Management on Internal Control over Financial Reporting. Our responsibility is to express an opinion on BNY Mellon'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 BNY Mellon 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 28, 2018

Item 1. Financial Statements

The Bank of New York Mellon Corporation (and its subsidiaries)

Consolidated Income Statement

<i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Fee and other revenue			
Investment services fees:			
Asset servicing	\$ 4,383	\$ 4,244	\$ 4,187
Clearing services	1,553	1,404	1,375
Issuer services	977	1,026	978
Treasury services	557	547	555
Total investment services fees	7,470	7,221	7,095
Investment management and performance fees	3,584	3,350	3,438
Foreign exchange and other trading revenue	668	701	768
Financing-related fees	216	219	220
Distribution and servicing	160	166	162
Investment and other income	64	341	316
Total fee revenue	12,162	11,998	11,999
Net securities gains — including other-than-temporary impairment	6	79	82
Noncredit-related portion of other-than-temporary impairment (recognized in other comprehensive income)	3	4	(1)
Net securities gains	3	75	83
Total fee and other revenue	12,165	12,073	12,082
Operations of consolidated investment management funds			
Investment income	74	35	115
Interest of investment management fund note holders	4	9	29
Income from consolidated investment management funds	70	26	86
Net interest revenue			
Interest revenue	4,382	3,575	3,326
Interest expense	1,074	437	300
Net interest revenue	3,308	3,138	3,026
Total revenue	15,543	15,237	15,194
Provision for credit losses	(24)	(11)	160
Noninterest expense			
Staff	5,972	5,733	5,837
Professional, legal and other purchased services	1,274	1,185	1,230
Software	744	647	627
Net occupancy	569	590	600
Distribution and servicing	419	405	381
Sub-custodian	250	245	270
Furniture and equipment	241	247	280
Business development	229	245	267
Bank assessment charges	220	219	157
Other	724	721	804
Amortization of intangible assets	209	237	261
Merger and integration, litigation and restructuring charges	106	49	85
Total noninterest expense	10,957	10,523	10,799
Income			
Income before income taxes	4,610	4,725	4,235
Provision for income taxes	496	1,177	1,013
Net income	4,114	3,548	3,222
Net (income) attributable to noncontrolling interests (includes \$(33), \$(10) and \$(68) related to consolidated investment management funds, respectively)	(24)	(1)	(64)
Net income applicable to shareholders of The Bank of New York Mellon Corporation	4,090	3,547	3,158
Preferred stock dividends	(175)	(122)	(105)
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	\$ 3,915	\$ 3,425	\$ 3,053

Consolidated Income Statement (continued)

Net income applicable to common shareholders of The Bank of New York Mellon Corporation used for the earnings per share calculation <i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	\$ 3,915	\$ 3,425	\$ 3,053
Less: Earnings allocated to participating securities (a)	43	52	43
Net income applicable to common shareholders of The Bank of New York Mellon Corporation after required adjustment for the calculation of basic and diluted earnings per common share	\$ 3,872	\$ 3,373	\$ 3,010

Average common shares and equivalents outstanding of The Bank of New York Mellon Corporation (a) <i>(in thousands)</i>	Year ended Dec. 31,		
	2017	2016	2015
Basic	1,034,281	1,066,286	1,104,719
Common stock equivalents	13,030	15,672	17,290
Less: Participating securities	(7,021)	(9,945)	(9,498)
Diluted	1,040,290	1,072,013	1,112,511
Anti-dilutive securities (b)	12,383	31,695	28,736

Earnings per share applicable to common shareholders of The Bank of New York Mellon Corporation (c) <i>(in dollars)</i>	Year ended Dec. 31,		
	2017	2016	2015
Basic	\$ 3.74	\$ 3.16	\$ 2.73
Diluted	\$ 3.72	\$ 3.15	\$ 2.71

- (a) Beginning in the third quarter of 2017, vested stock awards to retirement eligible employees are included in common shares outstanding for earnings per share purposes. This change resulted in a de minimis increase to both average basic and average diluted shares outstanding.
- (b) Represents stock options, restricted stock, restricted stock units and participating securities outstanding but not included in the computation of diluted average common shares because their effect would be anti-dilutive.
- (c) Basic and diluted earnings per share under the two-class method are determined on the net income applicable to common shareholders of The Bank of New York Mellon Corporation reported on the income statement less earnings allocated to participating securities.

See accompanying Notes to Consolidated Financial Statements.

Consolidated Comprehensive Income Statement

<i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Net income	\$ 4,114	\$ 3,548	\$ 3,222
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	853	(850)	(599)
Unrealized gain (loss) on assets available-for-sale:			
Unrealized gain (loss) arising during the period	153	(242)	(363)
Reclassification adjustment	(3)	(49)	(52)
Total unrealized gain (loss) on assets available-for-sale	150	(291)	(415)
Defined benefit plans:			
Net gain (loss) arising during the period	342	(108)	(65)
Foreign exchange adjustment	1	—	—
Amortization of prior service credit, net loss and initial obligation included in net periodic benefit cost	68	57	69
Total defined benefit plans	411	(51)	4
Net unrealized gain (loss) on cash flow hedges	9	(4)	8
Total other comprehensive income (loss), net of tax (a)	1,423	(1,196)	(1,002)
Total comprehensive income	5,537	2,352	2,220
Net (income) loss attributable to noncontrolling interests	(24)	(1)	(64)
Other comprehensive (income) loss attributable to noncontrolling interests	(15)	31	36
Comprehensive income applicable to shareholders of The Bank of New York Mellon Corporation	\$ 5,498	\$ 2,382	\$ 2,192

(a) Other comprehensive income (loss) attributable to The Bank of New York Mellon Corporation shareholders was \$1,408 million for the year ended Dec. 31, 2017, \$(1,165) million for the year ended Dec. 31, 2016 and \$(966) million for the year ended Dec. 31, 2015.

See accompanying Notes to Consolidated Financial Statements.

Consolidated Balance Sheet

<i>(dollars in millions, except per share amounts)</i>	Dec. 31,	
	2017	2016
Assets		
Cash and due from:		
Banks	\$ 5,382	\$ 4,822
Interest-bearing deposits with the Federal Reserve and other central banks	91,510	58,041
Interest-bearing deposits with banks	11,979	15,086
Federal funds sold and securities purchased under resale agreements	28,135	25,801
Securities:		
Held-to-maturity (fair value of \$40,512 and \$40,669)	40,827	40,905
Available-for-sale	79,543	73,822
Total securities	120,370	114,727
Trading assets	6,022	5,733
Loans	61,540	64,458
Allowance for loan losses	(159)	(169)
Net loans	61,381	64,289
Premises and equipment	1,634	1,303
Accrued interest receivable	610	568
Goodwill	17,564	17,316
Intangible assets	3,411	3,598
Other assets (includes \$791 and \$1,339, at fair value)	23,029	20,954
Subtotal assets of operations	371,027	332,238
Assets of consolidated investment management funds, at fair value	731	1,231
Total assets	\$ 371,758	\$ 333,469
Liabilities		
Deposits:		
Noninterest-bearing (principally U.S. offices)	\$ 82,716	\$ 78,342
Interest-bearing deposits in U.S. offices	52,294	52,049
Interest-bearing deposits in non-U.S. offices	109,312	91,099
Total deposits	244,322	221,490
Federal funds purchased and securities sold under repurchase agreements	15,163	9,989
Trading liabilities	3,984	4,389
Payables to customers and broker-dealers	20,184	20,987
Commercial paper	3,075	—
Other borrowed funds	3,028	754
Accrued taxes and other expenses	6,225	5,867
Other liabilities (including allowance for lending-related commitments of \$102 and \$112, also includes \$800 and \$597, at fair value)	6,050	5,635
Long-term debt (includes \$367 and \$363, at fair value)	27,979	24,463
Subtotal liabilities of operations	330,010	293,574
Liabilities of consolidated investment management funds, at fair value	2	315
Total liabilities	330,012	293,889
Temporary equity		
Redeemable noncontrolling interests	179	151
Permanent equity		
Preferred stock – par value \$0.01 per share; authorized 100,000,000 shares; issued 35,826 and 35,826 shares	3,542	3,542
Common stock – par value \$0.01 per share; authorized 3,500,000,000 shares; issued 1,354,163,581 and 1,333,706,427 shares	14	13
Additional paid-in capital	26,665	25,962
Retained earnings	25,635	22,621
Accumulated other comprehensive loss, net of tax	(2,357)	(3,765)
Less: Treasury stock of 340,721,136 and 286,218,126 common shares, at cost	(12,248)	(9,562)
Total The Bank of New York Mellon Corporation shareholders' equity	41,251	38,811
Nonredeemable noncontrolling interests of consolidated investment management funds	316	618
Total permanent equity	41,567	39,429
Total liabilities, temporary equity and permanent equity	\$ 371,758	\$ 333,469

See accompanying Notes to Consolidated Financial Statements.

Consolidated Statement of Cash Flows

<i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Operating activities			
Net income	\$ 4,114	\$ 3,548	\$ 3,222
Net (income) loss attributable to noncontrolling interests	(24)	(1)	(64)
Net income applicable to shareholders of The Bank of New York Mellon Corporation	4,090	3,547	3,158
Adjustments to reconcile net income to net cash provided by operating activities:			
Provision for credit losses	(24)	(11)	160
Pension plan contributions	(114)	(108)	(70)
Depreciation and amortization	1,474	1,502	1,457
Deferred tax expense (benefit)	133	(126)	47
Net securities (gains)	(3)	(75)	(83)
Change in trading assets and liabilities	(694)	1,522	(414)
Originations of loans held-for-sale	—	(350)	(1,106)
Proceeds from the sales of loans originated for sale	—	831	725
Change in accruals and other, net	(221)	(486)	253
Net cash provided by operating activities	4,641	6,246	4,127
Investing activities			
Change in interest-bearing deposits with banks	3,830	(327)	4,225
Change in interest-bearing deposits with the Federal Reserve and other central banks	(29,613)	53,347	(16,521)
Purchases of securities held-to-maturity	(8,329)	(6,673)	(16,060)
Paydowns of securities held-to-maturity	4,448	4,907	3,698
Maturities of securities held-to-maturity	3,992	3,738	1,222
Purchases of securities available-for-sale	(26,151)	(27,470)	(33,785)
Sales of securities available-for-sale	6,001	7,580	19,016
Paydowns of securities available-for-sale	9,129	8,826	8,776
Maturities of securities available-for-sale	6,319	11,347	14,689
Net change in loans	2,794	(1,483)	(4,615)
Sales of loans and other real estate	392	173	362
Change in federal funds sold and securities purchased under resale agreements	(2,334)	(1,407)	(4,071)
Net change in seed capital investments	(124)	(114)	287
Purchases of premises and equipment/capitalized software	(1,197)	(825)	(601)
Proceeds from the sale of premises and equipment	—	65	—
Acquisitions, net of cash	—	(38)	(9)
Dispositions, net of cash	—	1	17
Other, net	(207)	(444)	3,583
Net cash (used for) provided by investing activities	(31,050)	51,203	(19,787)
Financing activities			
Change in deposits	17,069	(54,738)	11,890
Change in federal funds purchased and securities sold under repurchase agreements	5,174	(5,013)	3,533
Change in payables to customers and broker-dealers	(813)	(911)	719
Change in other borrowed funds	1,852	225	(394)
Change in commercial paper	3,075	—	—
Net proceeds from the issuance of long-term debt	4,738	6,229	4,986
Repayments of long-term debt	(1,046)	(2,953)	(3,659)
Proceeds from the exercise of stock options	431	438	326
Issuance of common stock	34	27	26
Issuance of preferred stock	—	990	990
Treasury stock acquired	(2,686)	(2,398)	(2,355)
Common cash dividends paid	(901)	(778)	(760)
Preferred cash dividends paid	(175)	(122)	(105)
Other, net	28	(46)	(12)
Net cash provided by (used for) financing activities	26,780	(59,050)	15,185
Effect of exchange rate changes on cash	189	(114)	42
Change in cash and due from banks			
Change in cash and due from banks	560	(1,715)	(433)
Cash and due from banks at beginning of period	4,822	6,537	6,970
Cash and due from banks at end of period	\$ 5,382	\$ 4,822	\$ 6,537
Supplemental disclosures			
Interest paid	\$ 1,033	\$ 406	\$ 295
Income taxes paid	498	1,010	1,015
Income taxes refunded	20	307	901

See accompanying Notes to Consolidated Financial Statements.

Consolidated Statement of Changes in Equity

(in millions, except per share amount)	The Bank of New York Mellon Corporation shareholders						Non-redeemable noncontrolling interests of consolidated investment management funds	Total permanent equity	Redeemable noncontrolling interests/temporary equity
	Preferred stock	Common stock	Additional paid-in capital	Retained earnings	Accumulated other comprehensive (loss) income, net of tax	Treasury stock			
Balance at Dec. 31, 2016	\$ 3,542	\$ 13	\$ 25,962	\$ 22,621	\$ (3,765)	\$ (9,562)	\$ 618	\$ 39,429	(a) \$ 151
Shares issued to shareholders of noncontrolling interests	—	—	—	—	—	—	—	—	56
Redemption of subsidiary shares from noncontrolling interests	—	—	—	—	—	—	—	—	(70)
Other net changes in noncontrolling interests	—	—	(35)	—	—	—	(335)	(370)	36
Net income (loss)	—	—	—	4,090	—	—	33	4,123	(9)
Other comprehensive income	—	—	—	—	1,408	—	—	1,408	15
Dividends:									
Common stock at \$0.86 per share	—	—	—	(901)	—	—	—	(901)	—
Preferred stock	—	—	—	(175)	—	—	—	(175)	—
Repurchase of common stock	—	—	—	—	—	(2,686)	—	(2,686)	—
Common stock issued under:									
Employee benefit plans	—	—	28	—	—	—	—	28	—
Direct stock purchase and dividend reinvestment plan	—	—	26	—	—	—	—	26	—
Stock awards and options exercised	—	1	684	—	—	—	—	685	—
Balance at Dec. 31, 2017	\$ 3,542	\$ 14	\$ 26,665	\$ 25,635	\$ (2,357)	\$ (12,248)	\$ 316	\$ 41,567	(a) \$ 179

(a) Includes total The Bank of New York Mellon Corporation common shareholders' equity of \$35,269 million at Dec. 31, 2016 and \$37,709 million at Dec. 31, 2017.

(in millions, except per share amounts)	The Bank of New York Mellon Corporation shareholders						Non-redeemable noncontrolling interests of consolidated investment management funds	Total permanent equity	Redeemable noncontrolling interests/temporary equity
	Preferred stock	Common stock	Additional paid-in capital	Retained earnings	Accumulated other comprehensive (loss) income, net of tax	Treasury stock			
Balance at Dec. 31, 2015	\$ 2,552	\$ 13	\$ 25,262	\$ 19,974	\$ (2,600)	\$ (7,164)	\$ 738	\$ 38,775	(a) \$ 200
Shares issued to shareholders of noncontrolling interests	—	—	—	—	—	—	—	—	55
Redemption of subsidiary shares from noncontrolling interests	—	—	—	—	—	—	—	—	(102)
Other net changes in noncontrolling interests	—	—	(24)	—	—	—	(130)	(154)	38
Net income (loss)	—	—	—	3,547	—	—	10	3,557	(9)
Other comprehensive (loss)	—	—	—	—	(1,165)	—	—	(1,165)	(31)
Dividends:									
Common stock at \$0.72 per share	—	—	—	(778)	—	—	—	(778)	—
Preferred stock	—	—	—	(122)	—	—	—	(122)	—
Repurchase of common stock	—	—	—	—	—	(2,398)	—	(2,398)	—
Common stock issued under:									
Employee benefit plans	—	—	27	—	—	—	—	27	—
Direct stock purchase and dividend reinvestment plan	—	—	21	—	—	—	—	21	—
Preferred stock issued	990	—	—	—	—	—	—	990	—
Stock awards and options exercised	—	—	676	—	—	—	—	676	—
Balance at Dec. 31, 2016	\$ 3,542	\$ 13	\$ 25,962	\$ 22,621	\$ (3,765)	\$ (9,562)	\$ 618	\$ 39,429	(a) \$ 151

(a) Includes total The Bank of New York Mellon Corporation common shareholders' equity of \$35,485 million at Dec. 31, 2015 and \$35,269 million at Dec. 31, 2016.

Consolidated Statement of Changes in Equity (continued)

(in millions, except per share amounts)	The Bank of New York Mellon Corporation shareholders						Non-redeemable noncontrolling interests of consolidated investment management funds	Total permanent equity	Redeemable non-controlling interests/temporary equity
	Preferred stock	Common stock	Additional paid-in capital	Retained earnings	Accumulated other comprehensive income (loss), net of tax	Treasury stock			
Balance at Dec. 31, 2014	\$ 1,562	\$ 13	\$ 24,626	\$ 17,683	\$ (1,634)	\$ (4,809)	\$ 1,033	\$ 38,474	(a) \$ 229
Adjustment for the cumulative effect of applying ASU 2015-02 for the consolidation of a legal entity	—	—	—	—	—	—	602	602	—
Adjustment for the cumulative effect of applying ASU 2015-02 for the deconsolidation of a legal entity	—	—	—	—	—	—	(866)	(866)	—
Adjusted balance at Jan. 1, 2015	1,562	13	24,626	17,683	(1,634)	(4,809)	769	38,210	229
Shares issued to shareholders of noncontrolling interests	—	—	—	—	—	—	—	—	48
Redemption of subsidiary shares from noncontrolling interests	—	—	—	—	—	—	—	—	(92)
Other net changes in noncontrolling interests	—	—	(26)	—	—	—	(73)	(99)	29
Net income	—	—	—	3,158	—	—	68	3,226	(4)
Other comprehensive (loss)	—	—	—	—	(966)	—	(26)	(992)	(10)
Dividends:									
Common stock at \$0.68 per share	—	—	—	(762)	—	—	—	(762)	—
Preferred stock	—	—	—	(105)	—	—	—	(105)	—
Repurchase of common stock	—	—	—	—	—	(2,355)	—	(2,355)	—
Common stock issued under:									
Employee benefit plans	—	—	25	—	—	—	—	25	—
Direct stock purchase and dividend reinvestment plan	—	—	21	—	—	—	—	21	—
Preferred stock issued	990	—	—	—	—	—	—	990	—
Stock awards and options exercised	—	—	616	—	—	—	—	616	—
Balance at Dec. 31, 2015	\$ 2,552	\$ 13	\$ 25,262	\$ 19,974	\$ (2,600)	\$ (7,164)	\$ 738	\$ 38,775	(a) \$ 200

(a) Includes total The Bank of New York Mellon Corporation common shareholders' equity of \$35,879 million at Dec. 31, 2014 and \$35,485 million at Dec. 31, 2015.

See accompanying Notes to Consolidated Financial Statements.

Note 1 - Summary of significant accounting and reporting policies

Nature of operations

BNY Mellon is a global leader in providing a broad range of financial products and services in domestic and international markets. Through our two principal businesses, Investment Management and Investment Services, we serve the following major classes of customers - institutions, corporations and high net worth individuals. For institutions and corporations, we provide the following services:

- investment management;
- custody;
- foreign exchange;
- fund services;
- broker-dealer services;
- securities finance;
- collateral and liquidity services;
- clearing services
- depository receipts;
- corporate trust;
- global payments;
- trade finance; and
- cash management.

For individuals, we provide mutual funds, separate accounts, wealth management and private banking services. BNY Mellon's investment management businesses provide investment products in many asset classes and investment styles on a global basis.

Basis of presentation

The accounting and financial reporting policies of BNY Mellon, a global financial services company, conform to U.S. generally accepted accounting principles ("GAAP") and prevailing industry practices.

In the opinion of management, all adjustments necessary for a fair presentation of financial position, results of operations and cash flows for the periods presented have been made. These financial statements should be read in conjunction with BNY Mellon's Annual Report on Form 10-K for the year ended Dec. 31, 2017. Certain immaterial reclassifications have been made to prior periods to place them on a basis comparable with current period presentation.

Use of estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates based upon assumptions about future economic and market conditions which affect reported amounts and related disclosures in our financial statements. Although our current estimates contemplate current conditions and how we expect them to change in the future, it is reasonably possible that actual conditions could be worse than anticipated in those estimates, which could materially affect our results of operations and financial condition. Amounts subject to estimates are items such as allowance for loan losses and lending-related commitments, fair value of financial instruments and derivatives, other-than-temporary impairment, goodwill and other intangibles and pension accounting. Among other effects, such changes in estimates could result in future impairments of investment securities, goodwill and intangible assets and establishment of allowances for loan losses and lending-related commitments as well as changes in pension and post-retirement expense.

Changes in accounting

See Note 2 for the new accounting standards adopted in 2017.

Effective Oct. 1, 2016, we changed the accounting method for the amortization of premiums and accretion of discounts on mortgage-backed securities from the prepayment method (also referred to as the retrospective method) to the contractual method, which are both acceptable methods under ASC 310, *Receivables*. The calculation performed under the prepayment method was based on estimating principal prepayment assumptions, principally driven by interest rates, and estimating the remaining lives of securities. This method resulted in retrospective adjustments each period to reflect changes in those estimates as if the updated estimated lives had been applied since the acquisition of the securities. Under the contractual method, no assumption is made concerning prepayments. As principal prepayments occur, a portion of the unamortized premium or discount is recorded in interest revenue such that the effective yield of a security remains constant throughout the life of the security.

We have determined that the contractual method is the preferable method of accounting as it is more aligned with our approach to asset/liability management, it reduces reliance on complex estimates and judgments, and it is consistent with the method predominantly used by our peers. The impact of this change was not considered material to prior periods and, as a result, the cumulative effect of the change of approximately \$15 million was reflected as a positive adjustment to net interest revenue in the fourth quarter of 2016. We estimate that net interest revenue for 2016 would have been higher had we continued to use the prepayment method, but have not specifically quantified the impact subsequent to the effective date, as the estimated amortization is also immaterial.

Parent financial statements

The Parent financial statements in Note 17 of the Notes to Consolidated Financial Statements include the accounts of the Parent; those of a wholly owned financing subsidiary that functions as a financing entity for BNY Mellon and its subsidiaries; and MIPA, LLC, a single-member limited liability company, created to hold and administer corporate-owned life insurance. Financial data for the Parent, the financing subsidiary and the single-member limited liability company are combined for financial reporting purposes because of the limited function of these entities and the unconditional guarantee by BNY Mellon of their obligations.

Acquired businesses

The income statement and balance sheet include results of acquired businesses accounted for under the acquisition method of accounting pursuant to ASC 805, *Business Combinations* and equity investments from the dates of acquisition. Contingent purchase consideration was measured at its fair value and recorded on the purchase date. Any subsequent changes in the fair value of a contingent consideration liability are recorded through the income statement.

Equity method investments, including renewable energy investments

The consolidated financial statements include the accounts of BNY Mellon and its subsidiaries. Equity investments of less than a majority but at least 20% ownership are accounted for by the equity method and classified as other assets. Earnings on these

investments are reflected in fee and other revenue as investment services fees, investment management and performance fees or investment and other income, as appropriate, in the period earned.

A loss in value of an equity investment that is determined to be other-than-temporary, is recognized by reducing the carrying value of the equity investment down to its fair value.

Renewable energy investment projects through limited liability companies are accounted for using the equity method of accounting. The hypothetical liquidation at book value (“HLBV”) methodology is used to determine the loss that is recognized in each quarter. HLBV estimates the liquidation value at the beginning and end of each quarter, with the difference recognized as the amount of loss under the equity method.

The pre-tax losses are reported in investment and other income section of the income statement. The corresponding tax benefits and credits are recorded as a reduction to provision for income taxes on the income statement. The pre-tax losses, tax benefits and credits are included in our projected annual effective tax rate.

See Note 7 for the amount of our renewable energy investments. Below are our most significant equity method investments, other than the investments in renewable energy.

Equity method investments at Dec. 31, 2017		
<i>(dollars in millions)</i>	Percentage ownership	Book value
CIBC Mellon	50.0%	\$ 580
Siguler Guff	20.0%	\$ 246

Variable interest and voting model entities

We evaluate an entity for possible consolidation in accordance with ASC 810, *Consolidation*, which we adopted effective Jan. 1, 2015. We first determine whether or not we have variable interests in the entity, which are investments or other interests that absorb portions of an entity’s expected losses or receive portions of the entity’s expected returns. Our variable interests may include decision-maker or service provider fees, direct and indirect investments and investments made by related parties, including related parties under common control. If it is determined that

we do not have a variable interest in the entity, no further analysis is required and the entity is not consolidated.

If we hold a variable interest in the entity, further analysis is performed to determine if the entity is a VIE or a voting model entity (“VME”).

We consider the underlying facts and circumstances of individual entities when assessing whether or not an entity is a VIE. An entity is determined to be a VIE if the equity investors:

- do not have sufficient equity at risk for the entity to finance its activities without additional subordinated financial support; or
- lack one or more of the following characteristics of a controlling financial interest:
 - the power, through voting rights or similar rights, to direct the activities of an entity that most significantly impact the entity’s economic performance;
 - the obligation to absorb the expected losses of the entity; and
 - the right to receive the expected residual returns of the entity.

We consolidate a VIE if it is determined that we have a controlling financial interest in the entity. We have a controlling financial interest in a VIE when we have both (1) the power to direct the activities of the VIE that most significantly impact the VIE’s economic performance and (2) the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to that VIE.

For entities that do not meet the definition of a VIE, the entity is considered a VME. We consolidate these entities if we can exert control over the financial and operating policies of an investee, which can occur if we have a 50% or more voting interest in the entity.

Trading securities, available-for-sale securities and held-to-maturity securities

Securities are accounted for under ASC 320, *Investments - Debt and Equity Securities*. Securities are classified as trading, available-for-sale or held-to-maturity investment securities when they are purchased. Securities are classified as trading securities when our intention is to resell the securities. Securities are classified as available-for-

sale securities when we intend to hold the securities for an indefinite period of time or when the securities may be used for tactical asset/liability purposes and may be sold from time to time to effectively manage interest rate exposure, prepayment risk and liquidity needs. Securities are classified as held-to-maturity securities when we intend to hold them until maturity.

Trading securities are measured at fair value and included in trading assets on the balance sheet. Trading revenue includes both realized and unrealized gains and losses. The liability incurred on short-sale transactions, representing the obligation to deliver securities, is included in trading liabilities at fair value.

Available-for-sale securities are measured at fair value. The difference between fair value and amortized cost representing unrealized gains or losses on assets classified as available-for-sale, are recorded net of tax as an addition to or deduction from OCI, unless a security is deemed to have OTTI. Gains and losses on sales of available-for-sale securities are reported in the income statement. The cost of debt and equity securities sold is determined on a specific identification and average cost method, respectively. Held-to-maturity securities are measured at amortized cost.

Income on investment securities purchased is adjusted for amortization of premium and accretion of discount on a level yield basis, generally over their contractual life.

We routinely conduct periodic reviews to identify and evaluate each investment security to determine whether OTTI has occurred. We examine various factors when determining whether an impairment, representing the fair value of a security being below its amortized cost, is other than temporary. The following are examples of factors that we consider:

- The length of time and the extent to which the fair value has been less than the amortized cost basis;
- Whether management has an intent to sell the security;
- Whether the decline in fair value is attributable to specific adverse conditions affecting a particular investment;

- Whether the decline in fair value is attributable to specific conditions, such as conditions in an industry or in a geographic area;
- Whether a debt security has been downgraded by a rating agency;
- Whether a debt security exhibits cash flow deterioration; and
- For each non-agency RMBS, we compare the remaining credit enhancement that protects the individual security from losses against the projected losses of principal and/or interest expected to come from the underlying mortgage collateral, to determine whether such credit losses might directly impact the relevant security.

When we do not intend to sell the security and it is more likely than not that we will not be required to sell the security prior to recovery of its cost basis, the credit component of an OTTI of a debt security is recognized in earnings and the non-credit component is recognized in OCI.

The determination of whether a credit loss exists is based on the best estimate of the present value of cash flows to be collected from the debt security. Generally, cash flows are discounted at the effective interest rate implicit in the debt security at the time of acquisition. For debt securities that are beneficial interests in securitized financial assets and are not high credit quality, ASC 325, *Investments - Other*, provides that cash flows be discounted at the current yield used to accrete the beneficial interest.

If we intend to sell the security or it is more likely than not that we will be required to sell the security prior to recovery of its cost basis, the non-credit component of OTTI is recognized in earnings and subsequently accreted to interest income on an effective yield basis over the life of the security.

For held-to-maturity debt securities, the amount of OTTI recorded in OCI for the non-credit portion of a previous OTTI is amortized prospectively, as an increase to the carrying amount of the security, over the remaining life of the security on the basis of the timing of future estimated cash flows of the securities.

The accounting policies for the determination of the fair value of financial instruments and OTTI have been identified as “critical accounting estimates” as they require us to make numerous assumptions based

on available market data. See Note 4 of the Notes to Consolidated Financial Statements for these disclosures.

Loans and leases

Loans are reported net of any unearned income and deferred fees and costs. Certain loan origination and upfront commitment fees, as well as certain direct loan origination and commitment costs, are deferred and amortized as a yield adjustment over the lives of the related loans. Loans held for sale are carried at the lower of cost or fair value.

Unearned revenue on direct financing leases is accreted over the lives of the leases in decreasing amounts to provide a constant rate of return on the net investment in the leases. Revenue on leveraged leases is recognized on a basis to achieve a constant yield on the outstanding investment in the lease, net of the related deferred tax liability, in the years in which the net investment is positive. Gains and losses on residual values of leased equipment sold are included in investment and other income. Impairment of leveraged lease residual values is reflected in net interest revenue. Considering the nature of these leases and the number of significant assumptions, there is risk associated with the income recognition on these leases should any of the assumptions change materially in future periods.

A modified loan is considered a troubled debt restructuring (“TDR”) if the debtor is experiencing financial difficulties and the creditor grants a concession to the debtor that would not otherwise be considered. A TDR may include a transfer of real estate or other assets from the debtor to the creditor, or a modification of the term of the loan. TDRs are accounted for as impaired loans (see the Nonperforming assets policy).

Nonperforming assets

Commercial loans are placed on nonaccrual status when principal or interest is past due 90 days or more, or when there is reasonable doubt that interest or principal will be collected.

When a first lien residential mortgage loan reaches 90 days delinquent, it is subject to an impairment test and may be placed on nonaccrual status. At 180 days delinquent, the loan is subject to further impairment testing. The loan will remain on accrual status if the

realizable value of the collateral exceeds the unpaid principal balance plus accrued interest. If the loan is impaired, a charge-off is taken and the loan is placed on nonaccrual status. At 270 days delinquent, all first lien mortgages are placed on nonaccrual status. Second lien mortgages are automatically placed on nonaccrual status when they reach 90 days delinquent.

When a loan is placed on nonaccrual status, previously accrued and uncollected interest is reversed against current period interest revenue. Interest receipts on nonaccrual and impaired loans are recognized as interest revenue or are applied to principal when we believe the ultimate collectability of principal is in doubt. Nonaccrual loans generally are restored to an accrual basis when principal and interest become current and remain current for a specified period.

A loan is considered to be impaired when it is probable that we will be unable to collect all principal and interest amounts due according to the contractual terms of the loan agreement. An impairment allowance is measured based upon the loan's market value, the present value of expected future cash flows, discounted at the loan's initial effective interest rate, or at fair value of the collateral if the loan is collateral dependent. If the loan valuation is less than the recorded value of the loan, an impairment allowance is established by a provision for credit loss. Impairment allowances are not needed when the recorded investment in an impaired loan is less than the loan valuation.

Allowance for loan losses and allowance for lending-related commitments

The allowance for loan losses, shown as a valuation allowance to loans, and the allowance for lending-related commitments recorded in other liabilities are referred to as BNY Mellon's allowance for credit losses. The accounting policy for the determination of the adequacy of the allowances has been identified as a "critical accounting estimate" as it requires us to make numerous complex and subjective estimates and assumptions relating to amounts which are inherently uncertain.

The allowance for loan losses is maintained to absorb losses inherent in the loan portfolio as of the balance sheet date based on our judgment. The allowance determination methodology is designed to provide

procedural discipline in assessing the appropriateness of the allowance. Credit losses are charged against the allowance. Recoveries are added to the allowance.

The methodology for determining the allowance for lending-related commitments considers the same factors as the allowance for loan losses, as well as an estimate of the probability of drawdown at default. We utilize a quantitative methodology and qualitative framework for determining the allowance for loan losses and the allowance for lending-related commitments. Within this qualitative framework, management applies judgment when assessing internal risk factors and environmental factors to compute an additional allowance for each component of the loan portfolio.

The three elements of the allowance for loan losses and the allowance for lending-related commitments include the qualitative allowance framework. The three elements are:

- an allowance for impaired credits of \$1 million or greater;
- an allowance for higher risk-rated credits and pass-rated credits; and
- an allowance for residential mortgage loans.

Our lending is primarily to institutional customers. As a result, our loans are generally larger than \$1 million. Therefore, the first element, impaired credits, is based on individual analysis of all impaired loans of \$1 million and greater. The allowance is measured by the difference between the recorded value of impaired loans and their impaired value. Impaired value is either the present value of the expected future cash flows from the borrower, the market value of the loan, or the fair value of the collateral, if the loan is collateral dependent.

The second element, higher risk-rated credits and pass-rated credits, is based on our incurred loss model. Individual credit analyses are performed on such loans before being assigned a credit rating. All borrowers are collectively evaluated based on their credit rating. The loss inherent in each loan incorporates the borrower's credit rating, facility rating and maturity. The loss given default, derived from the facility rating, incorporates a recovery expectation and an estimate of the use of the facility at default (usage given default). The borrower's probability of default is derived from the associated

credit rating. Borrower ratings are reviewed at least annually and are periodically mapped to third-party databases, including rating agency and default and recovery databases, to ensure ongoing consistency and validity. Higher risk-rated credits are reviewed quarterly.

The third element, the allowance for residential mortgage loans, is determined by segregating six mortgage pools into delinquency periods ranging from current through foreclosure. Each of these delinquency periods is assigned a probability of default. A specific loss given default is assigned for each mortgage pool. BNY Mellon assigns all residential mortgage pools, except home equity lines of credit, a probability of default and loss given default based on default and loss data derived from internal historical data related to our residential mortgage portfolio. The resulting incurred loss factor (the probability of default multiplied by the loss given default) is applied against the loan balance to determine the allowance held for each pool. For home equity lines of credit, probability of default and loss given default are based on external data from third-party databases due to the small size of the portfolio and insufficient internal data.

The qualitative framework is used to determine an additional allowance for each portfolio based on the factors below:

Internal risk factors:

- Nonperforming loans to total non-margin loans;
- Criticized assets to total loans and lending-related commitments;
- Borrower concentration; and
- Significant concentrations in high risk industries and countries.

Environmental risk factors:

- U.S. non-investment grade default rate;
- Unemployment rate; and
- Change in real gross domestic product.

The objective of the qualitative framework is to capture incurred losses that may not have been fully captured in the quantitative reserve, which is based primarily on historical data. Management determines the qualitative allowance for each period based on judgment informed by consideration of internal and external risk factors and other considerations that may be deemed relevant during the period. Once

determined in the aggregate, our qualitative allowance is then allocated to each of our loan classes based on the respective classes' quantitative allowance balances with the allocations adjusted, when necessary, for class specific risk factors.

For each risk factor, we calculate the minimum and maximum values, and percentiles in-between, to evaluate the distribution of our historical experience. The distribution of historical experience is compared to the risk factor's current quarter observed experience to assess the current risk inherent in the portfolio and overall direction/trend of a risk factor relative to our historical experience.

Based on this analysis, we assign a risk level - no impact, low, moderate, high and elevated - to each risk factor for the current quarter. Management assesses the impact of each risk factor to determine an aggregate risk level. We do not quantify the impact of any particular risk factor. Management's assessment of the risk factors, as well as the trend in the quantitative allowance, supports management's judgment for the overall required qualitative allowance. A smaller qualitative allowance may be required when our quantitative allowance has reflected incurred losses associated with the aggregate risk level. A greater qualitative allowance may be required if our quantitative allowance does not yet reflect the incurred losses associated with the aggregate risk level.

The allocation of the allowance for credit losses is inherently judgmental, and the entire allowance for credit losses is available to absorb credit losses regardless of the nature of the loss.

Premises and equipment

Premises and equipment are carried at cost less accumulated depreciation and amortization. Depreciation and amortization is computed using the straight-line method over the estimated useful life of the owned asset and, for leasehold improvements, over the lesser of the remaining term of the leased facility or the estimated economic life of the improvement. For owned and capitalized assets, estimated useful lives range from 2 to 40 years. Maintenance and repairs are charged to expense as incurred, while major improvements are capitalized and amortized to operating expense over their identified useful lives.

Software

BNY Mellon capitalizes costs relating to acquired software and internal-use software development projects that provide new or significantly improved functionality. We capitalize projects that are expected to result in longer-term operational benefits, such as replacement systems or new applications that result in significantly increased operational efficiencies or functionality. All other costs incurred in connection with an internal-use software project are expensed as incurred. Capitalized software is recorded in other assets.

Identified intangible assets and goodwill

Identified intangible assets with estimable lives are amortized in a pattern consistent with the assets' identifiable cash flows or using a straight-line method over their remaining estimated benefit periods if the pattern of cash flows is not estimable. Intangible assets with estimable lives are reviewed for possible impairment when events or changed circumstances may affect the underlying basis of the asset.

Goodwill and intangibles with indefinite lives are not amortized, but are assessed annually for impairment, or more often if events and circumstances indicate it is more likely than not they may be impaired.

Beginning in 2017, with the adoption of ASU 2017-04, the amount of goodwill impairment is determined by the excess of the carrying value of the reporting unit over its fair value. The accounting policy for valuing and impairment testing of identified intangible assets and goodwill has been identified as a "critical accounting estimate" as it requires us to make numerous complex and subjective estimates. See Note 6 of the Notes to Consolidated Financial Statements for additional disclosures related to goodwill and intangible assets.

Investments in qualified affordable housing projects

Investments in qualified affordable housing projects through a limited liability entity are accounted for utilizing the proportional amortization method. Under the proportional amortization method, the initial cost of the investment is amortized to the provision for income taxes in proportion to the tax credits and other tax benefits received. The net investment performance, including tax credits and other benefits received, is recognized in the income statement as a component of income tax expense. Additionally, the value of the commitments to fund

qualified affordable housing projects is included in other assets on the balance sheet and a liability is recorded for the unfunded portion.

Seed capital

Seed capital investments are generally classified as other assets and carried at fair value. Unrealized gains and losses on seed capital investments are recorded in investment and other income. Certain risk retention investments in our collateralized loan obligations ("CLOs") are classified as available-for-sale securities. Any unrealized gains and losses are recorded net of tax, as an addition to or deduction from, other comprehensive income, unless the investment is deemed to have OTTI.

Noncontrolling interests

Noncontrolling interests included in permanent equity are adjusted for the income or (loss) attributable to the noncontrolling interest holders and any distributions to those shareholders. Redeemable noncontrolling interests are reported as temporary equity. BNY Mellon recognizes changes in the redemption value of the redeemable noncontrolling interests as they occur and adjusts the carrying value to be equal to the redemption value.

Fee revenue

We record investment services fees, investment management fees, foreign exchange and other trading revenue, financing-related fees, distribution and servicing, and other revenue when the services are provided and earned based on contractual terms, when amounts are determined and collectability is reasonably assured.

Additionally, we recognize revenue from non-refundable, upfront implementation fees under outsourcing contracts using a straight-line method, commencing in the period the ongoing services are performed through the expected term of the contractual relationship. Incremental direct set-up costs of implementation, up to the related implementation fee or minimum fee revenue amount, are deferred and amortized over the same period that the related implementation fees are recognized. If a client terminates an outsourcing contract prematurely, the unamortized deferred incremental direct set-up costs and the unamortized deferred up-front

implementation fees related to that contract are recognized in the period the contract is terminated.

Performance fees are recognized in the period in which the performance fees are earned and become determinable. Performance fees are generally calculated as a percentage of the applicable portfolio's performance in excess of a benchmark index or a peer group's performance. When a portfolio underperforms its benchmark or fails to generate positive performance, subsequent years' performance must generally exceed this shortfall prior to fees being earned. Amounts billable, which are subject to a clawback if future performance thresholds in current or future years are not met, are not recognized since the fees are potentially uncollectible. These fees are recognized when it is determined that they will be collected. When a multi-year performance contract provides that fees earned are billed ratably over the performance period, only the portion of the fees earned that are non-refundable are recognized.

Net interest revenue

Revenue on interest-earning assets and expense on interest-bearing liabilities are recognized based on the effective yield of the related financial instrument. The amortization of premiums and accretion of discounts are included in interest revenue and are adjusted for prepayments when they occur, such that, the effective yield remains constant throughout the contractual life of the security. Negative interest incurred on assets or charged on liabilities is presented as contra interest income and contra expense, respectively.

Foreign currency translation

Assets and liabilities denominated in foreign currencies are translated to U.S. dollars at the rate of exchange on the balance sheet date. Transaction gains and losses are included in the income statement. Translation gains and losses on investments in foreign entities with functional currencies that are not the U.S. dollar are recorded as foreign currency translation adjustments in OCI. Revenue and expense transactions are translated at the applicable daily rate or the weighted average monthly exchange rate when applying the daily rate is not practical.

Pension

The measurement date for BNY Mellon's pension plans is Dec. 31. Plan assets are determined based on fair value generally representing observable market prices. The projected benefit obligation is determined based on the present value of projected benefit distributions at an assumed discount rate. The discount rate utilized is based on the yield curves of high-quality corporate bonds available in the marketplace. The net periodic pension expense or credit includes service costs (if applicable), interest costs based on an assumed discount rate, an expected return on plan assets based on an actuarially derived market-related value, amortization of prior service cost and amortization of prior years' actuarial gains and losses.

Actuarial gains and losses include gains or losses related to changes in the amount of the projected benefit obligation or plan assets resulting from demographic or investment experience different than assumed, changes in the discount rate or other assumptions. To the extent an actuarial gain or loss exceeds 10% of the greater of the projected benefit obligation or the market-related value of plan assets, the excess is generally recognized over the future service periods of active employees. Effective June 30, 2015, benefit accruals under the U.S. pension plans were frozen. Future unrecognized actuarial gains and losses for the U.S. plans that exceed a threshold amount are amortized over the average future life expectancy of plan participants with a maximum of 15 years.

Our expected long-term rate of return on plan assets is based on anticipated returns for each applicable asset class. Anticipated returns are weighted for the expected allocation for each asset class and are based on forecasts for prospective returns in the equity and fixed-income markets, which should track the long-term historical returns for these markets. We also consider the growth outlook for U.S. and global economies, as well as current and prospective interest rates.

The market-related value utilized to determine the expected return on plan assets is based on the fair value of plan assets adjusted for the difference between expected returns and actual performance of plan assets. The difference between actual experience and expected returns on plan assets is included as an

adjustment in the market-related value over a five-year period.

BNY Mellon's accounting policy regarding pensions has been identified as a "critical accounting estimate" as it requires management to make numerous complex and subjective assumptions relating to amounts which are inherently uncertain. See Note 16 of the Notes to Consolidated Financial Statements for additional disclosures related to pensions.

Severance

BNY Mellon provides separation benefits for U.S.-based employees through The Bank of New York Mellon Corporation Supplemental Unemployment Benefit Plan. These benefits are provided to eligible employees separated from their jobs for business reasons not related to individual performance. Basic separation benefits are generally based on the employee's years of continuous benefited service. Severance for employees based outside of the U.S. is determined in accordance with local agreements and legal requirements. Severance expense is recorded when management commits to an action that will result in separation and the amount of the liability can be reasonably estimated.

Income taxes

We record current tax liabilities or assets through charges or credits to the current tax provision for the estimated taxes payable or refundable for the current year. Deferred tax assets and liabilities are recorded for future tax consequences attributable to differences between the financial statement carrying amounts of assets and liabilities and their respective tax bases. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. A deferred tax valuation allowance is established if it is more likely than not that all or a portion of the deferred tax assets will not be realized. A tax position that fails to meet a more-likely-than-not recognition threshold will result in either reduction of current or deferred tax assets, and/or recording of current or deferred tax liabilities. Interest and penalties related to income taxes are recorded as income tax expense.

Derivative financial instruments

Derivatives are recorded on the balance sheet at fair value and include futures, forwards, interest rate swaps, foreign currency swaps and options and similar products. Derivatives in an unrealized gain position are recognized as assets while derivatives in unrealized loss position are recognized as liabilities. Derivatives are reported net by counterparty and after consideration of cash collateral, to the extent subject to legally enforceable netting agreements. Derivatives designated and effective in qualifying hedging relationships are classified in other assets or other liabilities on the balance sheet. All other derivatives are classified within trading assets or trading liabilities on the balance sheet. Gains and losses on trading derivatives are included in foreign exchange and other trading revenue.

We enter into various derivative financial instruments for non-trading purposes primarily as part of our asset/liability management process. These derivatives are designated as either fair value or cash flow hedges of certain assets and liabilities or forecasted transactions when we enter into the derivative contracts. Gains and losses associated with fair value hedges are recorded in income as well as any change in the value of the related hedged item associated with the designated risks being hedged. Gains and losses on cash flow hedges are recorded in OCI, until reclassified into earnings in the same period the hedged item impacts earnings. Foreign currency transaction gains and losses related to a hedged net investment in a foreign operation, net of their tax effect, are recorded with cumulative foreign currency translation adjustments within OCI.

We formally document all relationships between hedging instruments and hedged items, as well as our risk-management objectives and strategy for undertaking various hedging transactions.

We formally assess, both at the hedge's inception and on an ongoing basis, whether the derivatives that are used in hedging transactions are highly effective and whether those derivatives are expected to remain highly effective in future periods. At inception, the potential causes of ineffectiveness related to each of our hedges is assessed to determine if we can expect the hedge to be highly effective over the life of the transaction and to determine the method for evaluating effectiveness on an ongoing basis.

Quarterly, we perform a quantitative effectiveness assessment and record any ineffectiveness in current earnings.

We discontinue hedge accounting prospectively when we determine that a derivative is no longer an effective hedge or the derivative expires, is sold, or management discontinues the derivative's hedge designation. Subsequent gains and losses on these derivatives are included in foreign exchange and other trading revenue. For discontinued fair value hedges, the accumulated gain or loss on the hedged item is amortized on a yield basis over the remaining life of the hedged item. When we discontinue cash flow hedge accounting and it is probable that the amount in OCI at the de-designation date continues to be reported in OCI until the forecasted transaction affects earnings. If cash flow hedge accounting is discontinued as a result of a forecasted transaction no longer being probable, then the amount reported in OCI is immediately reclassified to current earnings in foreign exchange and other trading revenue.

The determination of fair value of derivative financial instruments has been identified as a "critical accounting estimate." See Note 21 of the Notes to Consolidated Financial Statements for additional disclosures related to derivative financial instruments.

Statement of cash flows

We have defined cash as cash and due from banks. Cash flows from hedging activities are classified in the same category as the items hedged.

Stock-based compensation

Compensation expense relating to share-based payments is recognized in the income statement, on a straight-line basis, over the applicable vesting period.

Certain of our stock compensation grants vest when the employee retires. New grants with this feature are expensed by the first date the employee is eligible to retire. We estimate forfeitures when recording compensation cost related to share-based payment awards.

Note 2 - Accounting change and new accounting guidance

ASU 2017-04, Simplifying the Test for Goodwill Impairment

In January 2017, the FASB issued ASU 2017-04, *Simplifying the Test for Goodwill Impairment*. This ASU simplifies the annual goodwill impairment test by eliminating Step 2. The Step 2 calculation estimated the implied goodwill using the fair values of all assets, including previously unrecorded intangibles, and liabilities at the date of the test. Step 2 was required if the first step of the annual test indicated that the fair value of a reporting unit is less than its carrying value. After adopting this ASU, the amount of any goodwill impairment will be determined by the excess of the carrying value of a reporting unit over its fair value. The Company early adopted this ASU in the second quarter of 2017, in conjunction with our annual goodwill impairment test. The annual test did not result in any impairment.

ASU 2016-09, Compensation – Stock Compensation

In March 2016, the FASB issued ASU 2016-09, *Compensation – Stock Compensation*. This ASU simplifies several aspects of the accounting for share-based payment transactions, including income tax consequences, recognition of forfeitures and classification on the statement of cash flows. The Company adopted this ASU effective Jan. 1, 2017.

In 2017, we recorded an income tax benefit of \$50 million related to the vesting of stock awards and option exercises in the provision for income taxes. Previously, this had been recorded directly to additional paid-in capital. The impact in future periods will vary depending on the number of restricted stock units vesting (which primarily occurs in the first quarter of each year), the number of stock options exercised and the change in value since the grant date.

We continue to apply our accounting policy election for estimating forfeitures. Additionally, beginning in the quarter ended March 31, 2017, we reported excess tax benefits related to stock-based compensation as operating activities on the statement of cash flows and the employee taxes paid will continue to be reported as financing activities.

Note 3 - Acquisitions and dispositions

We sometimes structure our acquisitions with both an initial payment and later contingent payments tied to post-closing revenue or income growth. Contingent payments totaled \$2 million in 2017.

At Dec. 31, 2017, we are potentially obligated to pay additional consideration which, using reasonable assumptions, could range from \$0 million to \$16 million over the next two years, but could be higher as certain of the arrangements do not contain a contractual maximum. The acquisitions and dispositions described below did not have a material impact on BNY Mellon's results of operations.

Acquisition in 2016

On April 1, 2016, BNY Mellon acquired the assets of Atherton Lane Advisers, LLC, a U.S.-based investment manager with approximately \$2.45 billion in AUM and servicer for approximately 700 high-net-worth clients, for cash of \$38 million, plus contingent payments measured at \$22 million. Goodwill related to this acquisition totaled \$29 million and is included in the Investment Management business. The customer relationship intangible asset related to this acquisition is included in the Investment Management business, with an estimated life of 14 years, and totaled \$30 million at acquisition.

Acquisition in 2015

On Jan. 2, 2015, BNY Mellon acquired Cutwater Asset Management, a U.S.-based, fixed income and solutions specialist with approximately \$23 billion in AUM.

Disposition in 2015

On July 31, 2015, BNY Mellon sold Meriten Investment Management GmbH, a German-based investment management boutique, for \$40 million. As a result of this sale, we recorded an after-tax loss of \$12 million. Goodwill of \$22 million and customer relationship intangible assets of \$9 million were removed from the balance sheet as a result of this sale.

Note 4 - Securities

The following tables present the amortized cost, the gross unrealized gains and losses and the fair value of securities at Dec. 31, 2017, Dec. 31, 2016 and Dec. 31, 2015, respectively.

Securities at Dec. 31, 2017 <i>(in millions)</i>	Amortized cost	Gross unrealized		Fair value
		Gains	Losses	
Available-for-sale:				
U.S. Treasury	\$ 15,159	\$ 264	\$ 160	\$ 15,263
U.S. government agencies	917	1	10	908
State and political subdivisions	2,949	31	23	2,957
Agency RMBS	24,002	108	291	23,819
Non-agency RMBS	454	36	3	487
Other RMBS	152	3	6	149
Commercial MBS	1,360	6	6	1,360
Agency commercial MBS	8,793	36	67	8,762
CLOs	2,898	12	1	2,909
Other asset-backed securities	1,040	3	—	1,043
Foreign covered bonds	2,520	18	9	2,529
Corporate bonds	1,249	17	11	1,255
Sovereign debt/ sovereign guaranteed	12,405	175	23	12,557
Other debt securities	3,494	9	12	3,491
Money market funds	963	—	—	963
Non-agency RMBS (a)	811	281	1	1,091
Total securities available-for-sale (b)	\$ 79,166	\$ 1,000	\$ 623	\$ 79,543
Held-to-maturity:				
U.S. Treasury	\$ 9,792	\$ 6	\$ 56	\$ 9,742
U.S. government agencies	1,653	—	12	1,641
State and political subdivisions	17	—	1	16
Agency RMBS	26,208	51	332	25,927
Non-agency RMBS	57	5	—	62
Other RMBS	65	—	1	64
Commercial MBS	6	—	—	6
Agency commercial MBS	1,324	2	9	1,317
Foreign covered bonds	84	2	—	86
Sovereign debt/ sovereign guaranteed	1,593	30	—	1,623
Other debt securities	28	—	—	28
Total securities held-to-maturity	\$ 40,827	\$ 96	\$ 411	\$ 40,512
Total securities	\$ 119,993	\$ 1,096	\$ 1,034	\$ 120,055

- (a) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.
- (b) Includes gross unrealized gains of \$50 million and gross unrealized losses of \$144 million recorded in accumulated other comprehensive income related to investment securities that were transferred from available-for-sale to held-to-maturity. The unrealized gains and losses are primarily related to Agency RMBS and will be amortized into net interest revenue over the contractual lives of the securities.

Securities at Dec. 31, 2016				
<i>(in millions)</i>	Amortized cost	Gross unrealized		Fair value
		Gains	Losses	
Available-for-sale:				
U.S. Treasury	\$ 14,373	\$ 115	\$ 181	\$ 14,307
U.S. government agencies	366	2	9	359
State and political subdivisions	3,392	38	52	3,378
Agency RMBS	22,929	148	341	22,736
Non-agency RMBS	620	31	13	638
Other RMBS	517	4	8	513
Commercial MBS	931	8	11	928
Agency commercial MBS	6,505	28	84	6,449
CLOs	2,593	6	1	2,598
Other asset-backed securities	1,729	4	6	1,727
Foreign covered bonds	2,126	24	9	2,141
Corporate bonds	1,391	22	17	1,396
Sovereign debt/ sovereign guaranteed	12,248	261	20	12,489
Other debt securities	1,952	19	10	1,961
Equity securities	2	1	—	3
Money market funds	842	—	—	842
Non-agency RMBS (a)	1,080	286	9	1,357
Total securities available-for-sale (b)	\$ 73,596	\$ 997	\$ 771	\$ 73,822
Held-to-maturity:				
U.S. Treasury	\$ 11,117	\$ 22	\$ 41	\$ 11,098
U.S. government agencies	1,589	—	6	1,583
State and political subdivisions	19	—	1	18
Agency RMBS	25,221	57	299	24,979
Non-agency RMBS	78	4	2	80
Other RMBS	142	—	4	138
Commercial MBS	7	—	—	7
Agency commercial MBS	721	1	10	712
Foreign covered bonds	74	1	—	75
Sovereign debt/ sovereign guaranteed	1,911	42	—	1,953
Other debt securities	26	—	—	26
Total securities held-to-maturity	\$ 40,905	\$ 127	\$ 363	\$ 40,669
Total securities	\$ 114,501	\$ 1,124	\$ 1,134	\$ 114,491

- (a) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.
- (b) Includes gross unrealized gains of \$62 million and gross unrealized losses of \$190 million recorded in accumulated other comprehensive income related to investment securities that were transferred from available-for-sale to held-to-maturity. The unrealized gains and losses are primarily related to Agency RMBS and will be amortized into net interest revenue over the contractual lives of the securities.

Securities at Dec. 31, 2015				
<i>(in millions)</i>	Amortized cost	Gross unrealized		Fair value
		Gains	Losses	
Available-for-sale:				
U.S. Treasury	\$ 12,693	\$ 175	\$ 36	\$ 12,832
U.S. government agencies	386	2	1	387
State and political subdivisions	3,968	91	13	4,046
Agency RMBS	23,549	239	287	23,501
Non-agency RMBS	782	31	20	793
Other RMBS	1,072	10	21	1,061
Commercial MBS	1,400	8	16	1,392
Agency commercial MBS	4,031	24	35	4,020
CLOs	2,363	1	13	2,351
Other asset-backed securities	2,909	1	17	2,893
Foreign covered bonds	2,125	46	3	2,168
Corporate bonds	1,740	26	14	1,752
Sovereign debt/ sovereign guaranteed	13,036	211	30	13,217
Other debt securities	2,732	46	3	2,775
Equity securities	3	1	—	4
Money market funds	886	—	—	886
Non-agency RMBS (a)	1,435	362	8	1,789
Total securities available-for-sale (b)	\$ 75,110	\$ 1,274	\$ 517	\$ 75,867
Held-to-maturity:				
U.S. Treasury	\$ 11,326	\$ 25	\$ 51	\$ 11,300
U.S. government agencies	1,431	—	6	1,425
State and political subdivisions	20	—	1	19
Agency RMBS	26,036	134	205	25,965
Non-agency RMBS	118	5	2	121
Other RMBS	224	1	10	215
Commercial MBS	9	—	—	9
Agency commercial MBS	503	—	9	494
Foreign covered bonds	76	—	—	76
Sovereign debt/ sovereign guaranteed	3,538	22	11	3,549
Other debt securities	31	—	—	31
Total securities held-to-maturity	\$ 43,312	\$ 187	\$ 295	\$ 43,204
Total securities	\$ 118,422	\$ 1,461	\$ 812	\$ 119,071

- (a) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.
- (b) Includes gross unrealized gains of \$84 million and gross unrealized losses of \$248 million recorded in accumulated other comprehensive income related to investment securities that were transferred from available-for-sale to held-to-maturity. The unrealized gains and losses are primarily related to Agency RMBS and will be amortized into net interest revenue over the contractual lives of the securities.

The following table presents the realized gains, losses and impairments, on a gross basis.

Net securities gains (losses) (in millions)	2017	2016	2015
Realized gross gains	\$ 47	\$ 86	\$ 90
Realized gross losses	(40)	(4)	(2)
Recognized gross impairments	(4)	(7)	(5)
Total net securities gains	\$ 3	\$ 75	\$ 83

In 2017, other RMBS with an aggregate amortized cost of \$74 million and fair value of \$76 million were transferred from held-to-maturity securities to available-for-sale securities. Due to recent ratings downgrades, the Company no longer intends to hold these securities to maturity.

In 2015, Agency MBS, sovereign debt and U.S. Treasury securities with an aggregate amortized cost of \$11.6 billion and fair value of \$11.6 billion were transferred from available-for-sale securities to held-to-maturity securities. Additionally, in 2013, Agency RMBS securities with an amortized cost of \$7.3 billion and fair value of \$7.0 billion were transferred from available-for-sale securities to held-to-maturity securities. These actions, in addition to realizing gains on the sales of securities, are expected to mute the impact to our accumulated other comprehensive income in the event of a rise in interest rates.

Temporarily impaired securities

At Dec. 31, 2017, the unrealized losses on the investment securities portfolio were primarily attributable to an increase in interest rates from date of purchase, and for certain securities that were transferred from available-for-sale to held-to-maturity, an increase in interest rates through the date they were transferred. Specifically, \$144 million of the unrealized losses at Dec. 31, 2017 and \$190 million at Dec. 31, 2016 reflected in the available-for-sale sections of the tables below relate to certain securities (primarily Agency RMBS) that were transferred in prior periods from available-for-sale to held-to-maturity. The unrealized losses will be amortized into net interest revenue over the contractual lives of the securities. The transfer created a new cost basis for the securities. As a result, if these securities have experienced unrealized losses since the date of transfer, the corresponding fair value and unrealized losses would be reflected in the held-to-maturity sections of the following tables. We do not intend to sell these securities and it is not more likely than not that we will have to sell these securities.

The following tables show the aggregate fair value of investments with a continuous unrealized loss position for less than 12 months and those that have been in a continuous unrealized loss position for 12 months or more at Dec. 31, 2017 and Dec. 31, 2016, respectively.

Temporarily impaired securities at Dec. 31, 2017	Less than 12 months		12 months or more		Total	
	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
<i>(in millions)</i>						
Available-for-sale:						
U.S. Treasury	\$ 7,429	\$ 131	\$ 2,175	\$ 29	\$ 9,604	\$ 160
U.S. government agencies	588	6	160	4	748	10
State and political subdivisions	732	3	518	20	1,250	23
Agency RMBS	8,567	66	5,834	225	14,401	291
Non-agency RMBS	13	—	137	3	150	3
Other RMBS	71	4	45	2	116	6
Commercial MBS	476	3	122	3	598	6
Agency commercial MBS	3,077	28	1,332	39	4,409	67
CLOs	260	1	—	—	260	1
Foreign covered bonds	953	7	116	2	1,069	9
Corporate bonds	274	2	288	9	562	11
Sovereign debt/sovereign guaranteed	1,880	12	559	11	2,439	23
Other debt securities	1,855	7	368	5	2,223	12
Non-agency RMBS (a)	7	—	12	1	19	1
Total securities available-for-sale (b)	\$ 26,182	\$ 270	\$ 11,666	\$ 353	\$ 37,848	\$ 623
Held-to-maturity:						
U.S. Treasury	\$ 6,389	\$ 41	\$ 2,909	\$ 15	\$ 9,298	\$ 56
U.S. government agencies	791	4	850	8	1,641	12
State and political subdivisions	—	—	4	1	4	1
Agency RMBS	9,458	81	12,305	251	21,763	332
Other RMBS	—	—	50	1	50	1
Agency commercial MBS	737	7	60	2	797	9
Total securities held-to-maturity	\$ 17,375	\$ 133	\$ 16,178	\$ 278	\$ 33,553	\$ 411
Total temporarily impaired securities	\$ 43,557	\$ 403	\$ 27,844	\$ 631	\$ 71,401	\$ 1,034

(a) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.

(b) Includes gross unrealized losses for 12 months or more of \$144 million recorded in accumulated other comprehensive income related to investment securities that were transferred from available-for-sale to held-to-maturity. The unrealized losses are primarily related to Agency RMBS and will be amortized into net interest revenue over the contractual lives of the securities. There were no gross unrealized losses for less than 12 months.

Notes to Consolidated Financial Statements (continued)

Temporarily impaired securities at Dec. 31, 2016 <i>(in millions)</i>	Less than 12 months		12 months or more		Total	
	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
Available-for-sale:						
U.S. Treasury	\$ 8,489	\$ 181	\$ —	\$ —	\$ 8,489	\$ 181
U.S. government agencies	257	9	—	—	257	9
State and political subdivisions	1,058	33	131	19	1,189	52
Agency RMBS	14,766	141	1,673	200	16,439	341
Non-agency RMBS	21	—	332	13	353	13
Other RMBS	26	—	136	8	162	8
Commercial MBS	302	7	163	4	465	11
Agency commercial MBS	3,570	78	589	6	4,159	84
CLOs	443	1	404	—	847	1
Other asset-backed securities	276	1	357	5	633	6
Foreign covered bonds	712	9	—	—	712	9
Corporate bonds	594	16	7	1	601	17
Sovereign debt/sovereign guaranteed	1,521	20	63	—	1,584	20
Other debt securities	742	10	50	—	792	10
Non-agency RMBS (a)	25	—	47	9	72	9
Total securities available-for-sale (b)	\$ 32,802	\$ 506	\$ 3,952	\$ 265	\$ 36,754	\$ 771
Held-to-maturity:						
U.S. Treasury	\$ 6,112	\$ 41	\$ —	\$ —	\$ 6,112	\$ 41
U.S. government agencies	1,533	6	—	—	1,533	6
State and political subdivisions	—	—	4	1	4	1
Agency RMBS	19,498	297	102	2	19,600	299
Non-agency RMBS	4	—	48	2	52	2
Other RMBS	15	—	123	4	138	4
Agency commercial MBS	621	10	—	—	621	10
Total securities held-to-maturity	\$ 27,783	\$ 354	\$ 277	\$ 9	\$ 28,060	\$ 363
Total temporarily impaired securities	\$ 60,585	\$ 860	\$ 4,229	\$ 274	\$ 64,814	\$ 1,134

(a) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.

(b) Includes gross unrealized losses for 12 months or more of \$190 million recorded in accumulated other comprehensive income related to investment securities that were transferred from available-for-sale to held-to-maturity. The unrealized losses are primarily related to Agency RMBS and will be amortized into net interest revenue over the contractual lives of the securities. There were no gross unrealized losses for less than 12 months.

The following table shows the maturity distribution by carrying amount and yield (on a tax equivalent basis) of our investment securities portfolio.

Maturity distribution and yield on investment securities at Dec. 31, 2017 <i>(dollars in millions)</i>	U.S. Treasury		U.S. government agencies		State and political subdivisions		Other bonds, notes and debentures		Mortgage/asset-backed and equity securities		Total
	Amount	Yield (a)	Amount	Yield (a)	Amount	Yield (a)	Amount	Yield (a)	Amount	Yield (a)	
Securities available-for-sale:											
One year or less	\$ 1,862	1.05%	\$ —	—%	\$ 395	2.54%	\$ 4,524	1.00%	\$ —	—%	\$ 6,781
Over 1 through 5 years	7,048	1.75	263	1.75	1,567	3.20	12,414	0.99	—	—	21,292
Over 5 through 10 years	2,809	2.03	645	2.51	793	3.22	2,693	0.81	—	—	6,940
Over 10 years	3,544	3.11	—	—	202	2.55	201	1.64	—	—	3,947
Mortgage-backed securities	—	—	—	—	—	—	—	—	35,668	2.88	35,668
Asset-backed securities	—	—	—	—	—	—	—	—	3,952	2.41	3,952
Equity securities (b)	—	—	—	—	—	—	—	—	963	—	963
Total	\$ 15,263	2.03%	\$ 908	2.29%	\$ 2,957	3.07%	\$ 19,832	0.98%	\$ 40,583	2.77%	\$ 79,543
Securities held-to-maturity:											
One year or less	\$ 5,064	0.97%	\$ 531	1.07%	\$ —	—%	\$ 710	0.60%	\$ —	—%	\$ 6,305
Over 1 through 5 years	3,321	1.71	1,122	1.62	2	6.89	457	0.46	—	—	4,902
Over 5 through 10 years	1,407	1.92	—	—	1	6.84	538	0.85	—	—	1,946
Over 10 years	—	—	—	—	14	5.32	—	—	—	—	14
Mortgage-backed securities	—	—	—	—	—	—	—	—	27,660	2.80	27,660
Total	\$ 9,792	1.36%	\$ 1,653	1.45%	\$ 17	5.63%	\$ 1,705	0.64%	\$ 27,660	2.80%	\$ 40,827

(a) Yields are based upon the amortized cost of securities.

(b) Includes money market funds.

Other-than-temporary impairment

We conduct periodic reviews of all securities to determine whether OTTI has occurred. Such reviews may incorporate the use of economic models.

Various inputs to the economic models are used to determine if an unrealized loss on securities is other-than-temporary. For example, the most significant inputs related to non-agency RMBS are:

- Default rate - the number of mortgage loans expected to go into default over the life of the transaction, which is driven by the roll rate of loans in each performance bucket that will ultimately migrate to default; and
- Severity - the loss expected to be realized when a loan defaults.

To determine if an unrealized loss is other-than-temporary, we project total estimated defaults of the underlying assets (mortgages) and multiply that calculated amount by an estimate of realizable value upon sale of these assets in the marketplace (severity) in order to determine the projected collateral loss. In determining estimated default rate and severity assumptions, we review the performance of the underlying securities, industry studies and market forecasts, as well as our view of the economic outlook affecting collateral. We also evaluate the current credit enhancement underlying the bond to determine the impact on cash flows. If we determine that a given security will be subject to a write-down or loss, we record the expected credit loss as a charge to earnings.

The table below shows the projected weighted-average default rates and loss severities for the 2007, 2006 and late 2005 non-agency RMBS and the securities previously held in the Grantor Trust that we established in connection with the restructuring of our investment securities portfolio in 2009, at Dec. 31, 2017 and Dec. 31, 2016. See Note 18 for carrying values of these securities.

	Projected weighted-average default rates and loss severities			
	Dec. 31, 2017		Dec. 31, 2016	
	Default rate	Severity	Default rate	Severity
Alt-A	22%	53%	30%	54%
Subprime	38%	66%	49%	70%
Prime	13%	39%	18%	39%

The following table presents pre-tax net securities gains (losses) by type.

Net securities gains (losses) (in millions)	2017	2016	2015
Non-agency RMBS	\$ 4	\$ 8	\$ 7
Foreign covered bonds	—	10	2
Agency RMBS	(12)	22	10
U.S. Treasury	(16)	4	45
Other	27	31	19
Total net securities gains	\$ 3	\$ 75	\$ 83

The following table reflects investment securities credit losses recorded in earnings. The beginning balance represents the credit loss component for which OTTI occurred on debt securities in prior periods. The additions represent the first time a debt security was credit impaired or when subsequent credit impairments have occurred. The deductions represent credit losses on securities that have been sold, are required to be sold, or for which it is our intention to sell.

Debt securities credit loss roll forward (in millions)	2017	2016
Beginning balance as of Jan. 1	\$ 88	\$ 91
Add: Initial OTTI credit losses	—	—
Subsequent OTTI credit losses	4	7
Less: Realized losses for securities sold	8	10
Ending balance as of Dec. 31	\$ 84	\$ 88

Pledged assets

At Dec. 31, 2017, BNY Mellon had pledged assets of \$111 billion, including \$92 billion pledged as collateral for potential borrowings at the Federal Reserve Discount Window and \$5 billion pledged as collateral for borrowing at the Federal Home Loan Bank. The components of the assets pledged at Dec. 31, 2017 included \$96 billion of securities, \$13 billion of loans and \$2 billion of trading assets.

If there has been no borrowing at the Federal Reserve Discount Window, the Federal Reserve generally allows banks to freely move assets in and out of their pledged assets account to sell or repledge the assets for other purposes. BNY Mellon regularly moves assets in and out of its pledged assets account at the Federal Reserve.

At Dec. 31, 2016, BNY Mellon had pledged assets of \$102 billion, including \$84 billion pledged as collateral for potential borrowing at the Federal

Reserve Discount Window. The components of the assets pledged at Dec. 31, 2016 included \$87 billion of securities, \$8 billion of loans, \$4 billion of interest-bearing deposits with banks and \$3 billion of trading assets.

At Dec. 31, 2017 and Dec. 31, 2016, pledged assets included \$10 billion and \$6 billion, respectively, for which the recipients were permitted to sell or repledge the assets delivered.

We also obtain securities as collateral, including receipts under resale agreements, securities borrowed, derivative contracts and custody agreements on terms which permit us to sell or repledge the securities to others. At Dec. 31, 2017 and Dec. 31, 2016, the market value of the securities received that can be sold or repledged was \$86 billion and \$50 billion, respectively. We routinely sell or repledge these securities through delivery to third parties. As of Dec. 31, 2017 and Dec. 31, 2016, the market value of securities collateral sold or repledged was \$49 billion and \$20 billion, respectively.

Restricted cash and securities

Cash and securities may also be segregated under federal and other regulations or requirements. At Dec. 31, 2017 and Dec. 31, 2016, cash segregated under federal and other regulations or requirements was \$2 billion and \$3 billion, respectively. Restricted cash is included in interest-bearing deposits with banks on the consolidated balance sheet. Securities segregated for these purposes were \$1 billion at Dec. 31, 2017 and \$2 billion at Dec. 31, 2016. Restricted securities were sourced from securities purchased under resale agreements at Dec. 31, 2017 and Dec. 31, 2016 and are included in federal funds sold and securities purchased under resale agreements on the consolidated balance sheet.

Note 5 - Loans and asset quality

Loans

The table below provides the details of our loan portfolio and industry concentrations of credit risk at Dec. 31, 2017 and Dec. 31, 2016.

Loans <i>(in millions)</i>	Dec. 31,	
	2017	2016
Domestic:		
Commercial	\$ 2,744	\$ 2,286
Commercial real estate	4,900	4,639
Financial institutions	5,568	6,342
Lease financings	772	989
Wealth management loans and mortgages	16,420	15,555
Other residential mortgages	708	854
Overdrafts	963	1,055
Other	1,131	1,202
Margin loans	15,689	17,503
Total domestic	48,895	50,425
Foreign:		
Commercial	167	331
Commercial real estate	—	15
Financial institutions	7,483	8,347
Lease financings	527	736
Wealth management loans and mortgages	108	99
Other (primarily overdrafts)	4,264	4,418
Margin loans	96	87
Total foreign	12,645	14,033
Total loans (a)	\$ 61,540	\$ 64,458

(a) Net of unearned income of \$394 million at Dec. 31, 2017 and \$527 million at Dec. 31, 2016 primarily related to domestic and foreign lease financings.

Our loan portfolio consists of three portfolio segments: commercial, lease financings and mortgages. We manage our portfolio at the class level which consists of six classes of financing receivables: commercial, commercial real estate, financial institutions, lease financings, wealth management loans and mortgages, and other residential mortgages.

The following tables are presented for each class of financing receivable and provide additional information about our credit risks and the adequacy of our allowance for credit losses.

Allowance for credit losses

Transactions in the allowance for credit losses are summarized as follows.

Allowance for credit losses activity for the year ended Dec. 31, 2017										
<i>(in millions)</i>	Commercial	Commercial real estate	Financial institutions	Lease financings	Wealth management loans and mortgages	Other residential mortgages	All other	Foreign	Total	
Beginning balance	\$ 82	\$ 73	\$ 26	\$ 13	\$ 23	\$ 28	\$ —	\$ 36	\$ 281	
Charge-offs	—	—	—	—	—	(1)	—	—	(1)	
Recoveries	—	—	—	—	—	5	—	—	5	
Net recoveries	—	—	—	—	—	4	—	—	4	
Provision	(5)	3	(3)	(5)	(1)	(12)	—	(1)	(24)	
Ending balance	\$ 77	\$ 76	\$ 23	\$ 8	\$ 22	\$ 20	\$ —	\$ 35	\$ 261	
Allowance for:										
Loan losses	\$ 24	\$ 58	\$ 7	\$ 8	\$ 18	\$ 20	\$ —	\$ 24	\$ 159	
Lending-related commitments	53	18	16	—	4	—	—	11	102	
Individually evaluated for impairment:										
Loan balance	\$ —	\$ —	\$ 1	\$ —	\$ 5	\$ —	\$ —	\$ —	\$ 6	
Allowance for loan losses	—	—	—	—	1	—	—	—	1	
Collectively evaluated for impairment:										
Loan balance	\$ 2,744	\$ 4,900	\$ 5,567	\$ 772	\$ 16,415	\$ 708	\$ 17,783 (a)	\$ 12,645	\$ 61,534	
Allowance for loan losses	24	58	7	8	17	20	—	24	158	

(a) Includes \$963 million of domestic overdrafts, \$15,689 million of margin loans and \$1,131 million of other loans at Dec. 31, 2017.

Allowance for credit losses activity for the year ended Dec. 31, 2016										
<i>(in millions)</i>	Commercial	Commercial real estate	Financial institutions	Lease financings	Wealth management loans and mortgages	Other residential mortgages	All other	Foreign	Total	
Beginning balance	\$ 82	\$ 59	\$ 31	\$ 15	\$ 19	\$ 34	\$ —	\$ 35	\$ 275	
Charge-offs	—	—	—	—	—	(2)	—	—	(2)	
Recoveries	—	—	13	—	—	5	—	1	19	
Net recoveries	—	—	13	—	—	3	—	1	17	
Provision	—	14	(18)	(2)	4	(9)	—	—	(11)	
Ending balance	\$ 82	\$ 73	\$ 26	\$ 13	\$ 23	\$ 28	\$ —	\$ 36	\$ 281	
Allowance for:										
Loan losses	\$ 25	\$ 52	\$ 8	\$ 13	\$ 19	\$ 28	\$ —	\$ 24	\$ 169	
Lending-related commitments	57	21	18	—	4	—	—	12	112	
Individually evaluated for impairment:										
Loan balance	\$ —	\$ —	\$ —	\$ 4	\$ 5	\$ —	\$ —	\$ —	\$ 9	
Allowance for loan losses	—	—	—	2	3	—	—	—	5	
Collectively evaluated for impairment:										
Loan balance	\$ 2,286	\$ 4,639	\$ 6,342	\$ 985	\$ 15,550	\$ 854	\$ 19,760 (a)	\$ 14,033	\$ 64,449	
Allowance for loan losses	25	52	8	11	16	28	—	24	164	

(a) Includes \$1,055 million of domestic overdrafts, \$17,503 million of margin loans and \$1,202 million of other loans at Dec. 31, 2016.

Allowance for credit losses activity for the year ended Dec. 31, 2015

<i>(in millions)</i>	Commercial	Commercial real estate	Financial institutions	Lease financings	Wealth management loans and mortgages	Other residential mortgages	All other	Foreign	Total
Beginning balance	\$ 60	\$ 50	\$ 31	\$ 32	\$ 22	\$ 41	\$ —	\$ 44	\$ 280
Charge-offs	—	—	(170)	—	—	(2)	—	—	(172)
Recoveries	—	—	1	—	—	6	—	—	7
Net (charge-offs) recoveries	—	—	(169)	—	—	4	—	—	(165)
Provision	22	9	169	(17)	(3)	(11)	—	(9)	160
Ending balance	\$ 82	\$ 59	\$ 31	\$ 15	\$ 19	\$ 34	\$ —	\$ 35	\$ 275
Allowance for:									
Loan losses	\$ 24	\$ 37	\$ 9	\$ 15	\$ 15	\$ 34	\$ —	\$ 23	\$ 157
Lending-related commitments	58	22	22	—	4	—	—	12	118
Individually evaluated for impairment:									
Loan balance	\$ —	\$ 1	\$ 171	\$ —	\$ 8	\$ —	\$ —	\$ —	\$ 180
Allowance for loan losses	—	1	—	—	1	—	—	—	2
Collectively evaluated for impairment:									
Loan balance	\$ 2,115	\$ 3,496	\$ 6,469	\$ 1,007	\$ 13,239	\$ 1,035	\$ 21,388	(a) \$ 14,352	\$ 63,101
Allowance for loan losses	24	36	9	15	14	34	—	23	155

(a) Includes \$911 million of domestic overdrafts, \$19,340 million of margin loans and \$1,137 million of other loans at Dec. 31, 2015.

Nonperforming assets

The table below presents our nonperforming assets.

Nonperforming assets <i>(in millions)</i>	Dec. 31,	
	2017	2016
Nonperforming loans:		
Other residential mortgages	\$ 78	\$ 91
Wealth management loans and mortgages	7	8
Commercial real estate	1	—
Lease financings	—	4
Total nonperforming loans	86	103
Other assets owned	4	4
Total nonperforming assets	\$ 90	\$ 107

At Dec. 31, 2017, undrawn commitments to borrowers whose loans were classified as nonaccrual or reduced rate were not material.

Lost interest

The table below presents the amount of lost interest income.

Lost interest <i>(in millions)</i>	2017	2016	2015
	Amount by which interest income recognized on nonperforming loans exceeded reversals		
Total	\$ —	\$ —	\$ —
Foreign	—	—	—
Amount by which interest income would have increased if nonperforming loans at year-end had been performing for the entire year			
Total	\$ 5	\$ 6	\$ 6
Foreign	—	—	—

Impaired loans

The tables below present information about our impaired loans. We use the discounted cash flow method as the primary method for valuing impaired loans.

Impaired loans <i>(in millions)</i>	2017		2016		2015	
	Average recorded investment	Interest income recognized	Average recorded investment	Interest income recognized	Average recorded investment	Interest income recognized
Impaired loans with an allowance:						
Commercial real estate	\$ —	\$ —	\$ 1	\$ —	\$ 1	\$ —
Financial institutions	1	—	—	—	—	—
Wealth management loans and mortgages	2	—	5	—	6	—
Lease financings	1	—	3	—	—	—
Total impaired loans with an allowance	4	—	9	—	7	—
Impaired loans without an allowance:						
Commercial real estate	—	—	1	—	—	—
Financial institutions	—	—	102	—	—	—
Wealth management loans and mortgages	3	—	2	—	2	—
Total impaired loans without an allowance (a)	3	—	105	—	2	—
Total impaired loans	\$ 7	\$ —	\$ 114	\$ —	\$ 9	\$ —

(a) When the discounted cash flows, collateral value or market price equals or exceeds the carrying value of the loan, then the loan does not require an allowance under the accounting standard related to impaired loans.

Impaired loans <i>(in millions)</i>	Dec. 31, 2017			Dec. 31, 2016		
	Recorded investment	Unpaid principal balance	Related allowance (a)	Recorded investment	Unpaid principal balance	Related allowance (a)
Impaired loans with an allowance:						
Commercial real estate	\$ —	\$ 3	\$ —	\$ —	\$ 3	\$ —
Financial institutions	1	1	—	—	—	—
Wealth management loans and mortgages	1	1	1	3	3	3
Lease financings	—	—	—	4	4	2
Total impaired loans with an allowance	2	5	1	7	10	5
Impaired loans without an allowance:						
Wealth management loans and mortgages	4	4	N/A	2	2	N/A
Total impaired loans without an allowance (b)	4	4	N/A	2	2	N/A
Total impaired loans (c)	\$ 6	\$ 9	\$ 1	\$ 9	\$ 12	\$ 5

(a) The allowance for impaired loans is included in the allowance for loan losses.

(b) When the discounted cash flows, collateral value or market price equals or exceeds the carrying value of the loan, then the loan does not require an allowance under the accounting standard related to impaired loans.

(c) Excludes an aggregate of less than \$1 million of impaired loans in amounts individually less than \$1 million at both Dec. 31, 2017 and Dec. 31, 2016, respectively. The allowance for loan losses associated with these loans totaled less than \$1 million at both Dec. 31, 2017 and Dec. 31, 2016, respectively.

Past due loans

The table below presents our past due loans.

Past due loans and still accruing interest <i>(in millions)</i>	Dec. 31, 2017				Dec. 31, 2016			
	Days past due			Total past due	Days past due			Total past due
	30-59	60-89	≥90		30-59	60-89	≥90	
Commercial real estate	\$ 44	\$ —	\$ —	\$ 44	\$ 78	\$ —	\$ —	\$ 78
Wealth management loans and mortgages	39	5	—	44	21	2	—	23
Other residential mortgages	18	5	5	28	20	6	7	33
Financial institutions	1	—	—	1	1	27	—	28
Total past due loans	\$ 102	\$ 10	\$ 5	\$ 117	\$ 120	\$ 35	\$ 7	\$ 162

Troubled debt restructurings (“TDRs”)

A modified loan is considered a TDR if the debtor is experiencing financial difficulties and the creditor grants a concession to the debtor that would not

otherwise be considered. A TDR may include a transfer of real estate or other assets from the debtor to the creditor, or a modification of the term of the loan. Not all modified loans are considered TDRs.

The following table presents our TDRs.

TDRs <i>(dollars in millions)</i>	2017			2016		
	Number of contracts	Outstanding recorded investment		Number of contracts	Outstanding recorded investment	
		Pre-modification	Post-modification		Pre-modification	Post-modification
Other residential mortgages	50	\$ 13	\$ 14	70	\$ 14	\$ 16
Wealth management loans and mortgages	2	6	6	2	—	—
Total TDRs	52	\$ 19	\$ 20	72	\$ 14	\$ 16

Other residential mortgages

The modifications of the other residential mortgage loans in 2017 and 2016 consisted of reducing the stated interest rates and, in certain cases, a forbearance of default and extending the maturity dates. The modified loans are primarily collateral dependent for which the value is based on the fair value of the collateral.

in a TDR during the previous 12 months and have subsequently defaulted in 2017. The total recorded investment of these loans was \$5 million.

TDRs that subsequently defaulted

There were 20 residential mortgage loans and two wealth management loans that had been restructured

Credit quality indicators

Our credit strategy is to focus on investment grade clients that are active users of our non-credit services. Each customer is assigned an internal credit rating, which is mapped to an external rating agency grade equivalent, if possible, based upon a number of dimensions, which are continually evaluated and may change over time.

The following tables present information about credit quality indicators.

Commercial loan portfolio

Commercial loan portfolio – Credit risk profile by creditworthiness category <i>(in millions)</i>	Commercial		Commercial real estate		Financial institutions	
	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
Investment grade	\$ 2,685	\$ 2,397	\$ 4,277	\$ 3,823	\$ 10,021	\$ 11,459
Non-investment grade	226	220	623	831	3,030	3,230
Total	\$ 2,911	\$ 2,617	\$ 4,900	\$ 4,654	\$ 13,051	\$ 14,689

The commercial loan portfolio is divided into investment grade and non-investment grade categories based on rating criteria largely consistent with those of the public rating agencies. Each customer in the portfolio is assigned an internal credit rating. These internal credit ratings are generally consistent with the ratings categories of the public rating agencies. Customers with ratings consistent with BBB- (S&P)/Baa3 (Moody’s) or better are

considered to be investment grade. Those clients with ratings lower than this threshold are considered to be non-investment grade.

Wealth management loans and mortgages

Wealth management loans and mortgages – Credit risk profile by internally assigned grade		
<i>(in millions)</i>	Dec. 31, 2017	Dec. 31, 2016
Wealth management loans:		
Investment grade	\$ 7,042	\$ 7,127
Non-investment grade	185	260
Wealth management mortgages	9,301	8,267
Total	\$ 16,528	\$ 15,654

Wealth management non-mortgage loans are not typically rated by external rating agencies. A majority of the wealth management loans are secured by the customers' investment management accounts or custody accounts. Eligible assets pledged for these loans are typically investment grade fixed-income securities, equities and/or mutual funds. Internal ratings for this portion of the wealth management portfolio, therefore, would equate to investment grade external ratings. Wealth management loans are provided to select customers based on the pledge of other types of assets, including business assets, fixed assets or a modest amount of commercial real estate. For the loans collateralized by other assets, the credit quality of the obligor is carefully analyzed, but we do not consider this portfolio of loans to be investment grade.

Credit quality indicators for wealth management mortgages are not correlated to external ratings. Wealth management mortgages are typically loans to high-net-worth individuals, which are secured primarily by residential property. These loans are primarily interest-only, adjustable rate mortgages with a weighted-average loan-to-value ratio of 62% at origination. In the wealth management portfolio, less than 1% of the mortgages were past due at Dec. 31, 2017.

At Dec. 31, 2017, the wealth management mortgage portfolio consisted of the following geographic concentrations: California - 24%; New York - 18%; Massachusetts - 11%; Florida - 8%; and other - 39%.

Other residential mortgages

The other residential mortgage portfolio primarily consists of 1-4 family residential mortgage loans and totaled \$708 million at Dec. 31, 2017 and \$854 million at Dec. 31, 2016. These loans are not typically correlated to external ratings. Included in this portfolio at Dec. 31, 2017 are \$171 million of

mortgage loans purchased in 2005, 2006 and the first quarter of 2007 that are predominantly prime mortgage loans, with a small portion of Alt-A loans. As of Dec. 31, 2017, the purchased loans in this portfolio had a weighted-average loan-to-value ratio of 76% at origination and 12% of the serviced loan balance was at least 60 days delinquent. The properties securing the prime and Alt-A mortgage loans were located (in order of concentration) in California, Florida, Virginia, the tri-state area (New York, New Jersey and Connecticut) and Maryland.

Overdrafts

Overdrafts primarily relate to custody and securities clearance clients and totaled \$5.1 billion at Dec. 31, 2017 and \$5.5 billion at Dec. 31, 2016. Overdrafts occur on a daily basis primarily in the custody and securities clearance business and are generally repaid within two business days.

Other loans

Other loans primarily include loans to consumers that are fully collateralized with equities, mutual funds and fixed-income securities.

Margin loans

We had \$15.8 billion of secured margin loans on our balance sheet at Dec. 31, 2017 compared with \$17.6 billion at Dec. 31, 2016. Margin loans are collateralized with marketable securities, and borrowers are required to maintain a daily collateral margin in excess of 100% of the value of the loan. We have rarely suffered a loss on these types of loans and do not allocate any of our allowance for credit losses to margin loans.

Reverse repurchase agreements

Reverse repurchase agreements are transactions fully collateralized with high-quality liquid securities. These transactions carry minimal credit risk and therefore are not allocated an allowance for credit losses.

Note 6 - Goodwill and intangible assets*Goodwill*

The table below provides a breakdown of goodwill by business.

Goodwill by business <i>(in millions)</i>	Investment Management	Investment Services <i>(a)</i>	Other <i>(a)</i>	Consolidated
Balance at Dec. 31, 2015	\$ 9,207	\$ 8,366	\$ 45	\$ 17,618
Acquisition (dispositions)	29	(2)	—	27
Foreign currency translation	(238)	(91)	—	(329)
Other <i>(b)</i>	2	(4)	2	—
Balance at Dec. 31, 2016	\$ 9,000	\$ 8,269	\$ 47	\$ 17,316
Foreign currency translation	128	120	—	248
Balance at Dec. 31, 2017	\$ 9,128	\$ 8,389	\$ 47	\$ 17,564

(a) Includes the reclassification of goodwill associated with credit-related activities from the Other segment to Investment Services in 2016.

(b) Other changes in goodwill include purchase price adjustments and certain other reclassifications.

Total goodwill increased in 2017 compared with 2016 reflecting the impact of foreign exchange translation on non-U.S. dollar denominated goodwill.

Intangible assets

The table below provides a breakdown of intangible assets by business.

Intangible assets – net carrying amount by business <i>(in millions)</i>	Investment Management	Investment Services	Other	Consolidated
Balance at Dec. 31, 2015	\$ 1,807	\$ 1,186	\$ 849	\$ 3,842
Acquisitions	30	2	—	32
Amortization <i>(a)</i>	(82)	(155)	—	(237)
Foreign currency translation	(38)	(1)	—	(39)
Balance at Dec. 31, 2016	\$ 1,717	\$ 1,032	\$ 849	\$ 3,598
Amortization	(60)	(149)	—	(209)
Foreign currency translation	17	5	—	22
Balance at Dec. 31, 2017	\$ 1,674	\$ 888	\$ 849	\$ 3,411

(a) Includes \$6 million of impairment charges related to the write-down of intangible assets in the Investment Management business, to their respective fair values.

Intangible assets decreased in 2017 compared with 2016 primarily reflecting amortization. Amortization of intangible assets was \$209 million in 2017, \$237 million in 2016 and \$261 million in 2015.

The table below provides a breakdown of intangible assets by type.

Intangible assets (in millions)	Dec. 31, 2017				Dec. 31, 2016		
	Gross carrying amount	Accumulated amortization	Net carrying amount	Remaining weighted-average amortization period	Gross carrying amount	Accumulated amortization	Net carrying amount
Subject to amortization: (a)							
Customer relationships—Investment Management	\$ 1,262	\$ (1,015)	\$ 247	11 years	\$ 1,439	\$ (1,136)	\$ 303
Customer contracts—Investment Services	2,260	(1,744)	516	10 years	2,249	(1,590)	659
Other	42	(23)	19	5 years	37	(33)	4
Total subject to amortization	3,564	(2,782)	782	10 years	3,725	(2,759)	966
Not subject to amortization: (b)							
Tradenames	1,334	N/A	1,334	N/A	1,348	N/A	1,348
Customer relationships	1,295	N/A	1,295	N/A	1,284	N/A	1,284
Total not subject to amortization	2,629	N/A	2,629	N/A	2,632	N/A	2,632
Total intangible assets	\$ 6,193	\$ (2,782)	\$ 3,411	N/A	\$ 6,357	\$ (2,759)	\$ 3,598

(a) Excludes fully amortized intangible assets.

(b) Intangible assets not subject to amortization have an indefinite life.

Estimated annual amortization expense for current intangibles for the next five years is as follows:

For the year ended Dec. 31,	Estimated amortization expense (in millions)
2018	\$ 180
2019	116
2020	102
2021	79
2022	60

Impairment testing

The goodwill impairment test is performed at least annually at the reporting unit level. Intangible assets not subject to amortization are tested for impairment annually or more often if events or circumstances indicate they may be impaired.

BNY Mellon's three business segments include eight reporting units for which goodwill impairment testing is performed on an annual basis. The Investment Management segment consists of two reporting units. The Investment Services segment consists of five reporting units. One reporting unit is included in the Other segment. In the second quarter of 2017, BNY Mellon conducted an annual goodwill impairment test on all eight reporting units. As a result of the annual goodwill impairment test of the eight reporting units, no goodwill impairment was recognized.

Note 7 - Other assets

The following table provides the components of other assets presented on the consolidated balance sheet.

Other assets (in millions)	Dec. 31,	
	2017	2016
Corporate/bank-owned life insurance	\$ 4,857	\$ 4,789
Accounts receivable	4,590	4,060
Fails to deliver	2,817	1,732
Income taxes receivable	1,533	1,172
Software	1,499	1,451
Prepaid pension assets	1,416	836
Renewable energy investments	1,368	1,282
Equity in a joint venture and other investments	1,083	1,063
Qualified affordable housing project investments	1,014	914
Federal Reserve Bank stock	477	466
Prepaid expense	395	438
Fair value of hedging derivatives	323	784
Due from customers on acceptances	319	340
Seed capital	288	395
Other (a)	1,050	1,232
Total other assets	\$ 23,029	\$ 20,954

(a) At Dec. 31, 2017, other assets include \$82 million of Federal Home Loan Bank stock, at cost.

Qualified affordable housing project investments

We invest in affordable housing projects primarily to satisfy the Company's requirements under the Community Reinvestment Act. Our total investment in qualified affordable housing projects totaled \$1.0 billion at Dec. 31, 2017 and \$914 million at Dec. 31, 2016. Commitments to fund future investments in

qualified affordable housing projects totaled \$486 million at Dec. 31, 2017 and \$369 million at Dec. 31, 2016 and is recorded in other liabilities. A summary of the commitments to fund future investments is as follows: 2018 – \$200 million; 2019 – \$119 million; 2020 – \$107 million; 2021 – \$42 million; 2022 – \$1 million; and 2023 and thereafter – \$17 million.

Tax credits and other tax benefits recognized were \$156 million in 2017, \$155 million in 2016 and \$130 million in 2015.

Amortization expense included in the provision for income taxes was \$153 million in 2017, \$115 million in 2016 and \$99 million in 2015.

Certain seed capital and private equity investments valued using net asset value per share

In our Investment Management business, we manage investment assets, including equities, fixed income,

money market and multi-asset and alternative investment funds for institutions and other investors. As part of that activity, we make seed capital investments in certain funds. BNY Mellon also holds private equity investments, specifically in SBICs, which are compliant with the Volcker Rule. Seed capital and private equity investments are generally included in other assets on the consolidated balance sheet. Certain risk retention investments in our CLOs are classified as available-for-sale securities on the consolidated balance sheet.

The fair value of certain of these investments has been estimated using the NAV per share of BNY Mellon’s ownership interest in the funds. The table below presents information about our investments in seed capital and private equity investments that have been valued using NAV.

<i>(dollar amounts in millions)</i>	Seed capital and private equity investments valued using NAV				Seed capital and private equity investments valued using NAV			
	Dec. 31, 2017				Dec. 31, 2016			
	Fair value	Unfunded commitments	Redemption frequency	Redemption notice period	Fair value	Unfunded commitments	Redemption frequency	Redemption notice period
Seed capital and other funds (a)	\$ 99	\$ 1	Daily- quarterly	1-95 days	\$ 171	\$ 1	Daily- quarterly	1-180 days
Private equity investments (SBICs) (b)	55	42	N/A	N/A	43	46	N/A	N/A
Total	\$ 154	\$ 43			\$ 214	\$ 47		

(a) Other funds include various hedge funds, leveraged loans and structured credit funds. Redemption notice periods vary by fund.

(b) Private equity investments primarily include Volcker Rule-compliant investments in SBICs that invest in various sectors of the economy. Private equity investments do not have redemption rights. Distributions from such investments will be received as the underlying investments in the private equity investments, which have a life of 10 years, are liquidated.

Note 8 - Deposits

Total time deposits in denominations of \$100,000 or greater was \$38.1 billion at Dec. 31, 2017, and \$38.9 billion at Dec. 31, 2016. At Dec. 31, 2017, the scheduled maturities of all time deposits are as follows: 2018 – \$40 billion; 2019 – \$1 million; 2020 – \$1 million; 2021 – \$- million; 2022 – \$- million; and 2023 and thereafter – \$- million.

Note 9 - Net interest revenue

The following table provides the components of net interest revenue presented on the consolidated income statement.

Net interest revenue <i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Interest revenue			
Non-margin loans	\$ 1,077	\$ 873	\$ 727
Margin loans	343	265	207
Securities:			
Taxable	1,977	1,772	1,813
Exempt from federal income taxes	64	70	82
Total securities	2,041	1,842	1,895
Deposits with banks	120	104	104
Deposits with the Federal Reserve and other central banks	319	198	170
Federal funds sold and securities purchased under resale agreements	423	233	147
Trading assets	59	60	76
Total interest revenue	4,382	3,575	3,326
Interest expense			
Deposits in domestic offices	107	41	30
Deposits in foreign offices	55	(25)	7
Federal funds purchased and securities sold under repurchase agreements	225	36	(6)
Trading liabilities	7	6	9
Other borrowed funds	26	8	9
Commercial paper	29	5	2
Customer payables	64	12	7
Long-term debt	561	354	242
Total interest expense	1,074	437	300
Net interest revenue	3,308	3,138	3,026
Provision for credit losses	(24)	(11)	160
Net interest revenue after provision for credit losses	\$ 3,332	\$ 3,149	\$ 2,866

Note 10 - Income taxes

The components of the income tax provision are as follows:

Provision for income taxes <i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Current taxes (benefits):			
Federal	\$ (99)	\$ 823	\$ 551
Foreign	388	327	306
State and local	74	153	109
Total current tax expense	363	1,303	966
Deferred tax expense (benefit):			
Federal	36	(75)	114
Foreign	14	(14)	(1)
State and local	83	(37)	(66)
Total deferred tax expense (benefit)	133	(126)	47
Provision for income taxes	\$ 496	\$ 1,177	\$ 1,013

Due to the timing of the enactment and the complexity involved in applying the provisions of the U.S. tax legislation, we have calculated a reasonable estimate and recorded a provisional benefit of \$710 million. The provisional benefit is based on a number of estimates and assumptions, including but not limited to our interpretation of the U.S. tax legislation and analysis of foreign earnings and profits. The provisional amount may change, possibly materially, based on additional guidance or analysis of the U.S. tax legislation and final foreign earnings and profits. In addition the filing of our 2017 income tax returns could impact the remeasurement of our deferred tax assets and liabilities; we expect to complete our analysis in the second half of 2018.

Income tax (benefit) expense <i>(estimated in millions)</i>	2017
Remeasurement of net deferred tax liabilities	\$ (1,472)
Repatriation tax	723
Other items	39
Net income tax (benefit)	\$ (710)

The components of income before taxes are as follows:

Income before taxes <i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Domestic	\$ 2,699	\$ 3,147	\$ 2,698
Foreign	1,911	1,578	1,537
Income before taxes	\$ 4,610	\$ 4,725	\$ 4,235

The components of our net deferred tax liability are as follows:

Net deferred tax liability <i>(in millions)</i>	Dec. 31,	
	2017	2016
Depreciation and amortization	\$ 1,960	\$ 2,694
Repatriation	617	—
Lease financings	151	391
Pension obligation	283	184
Renewable energy investment	278	179
Equity investments	65	104
Employee benefits	(287)	(471)
Reserves not deducted for tax	(103)	(136)
Credit losses on loans	(55)	(100)
Securities valuation	11	(55)
Other assets	(85)	(101)
Other liabilities	186	162
Net deferred tax liability	\$ 3,021	\$ 2,851

As of Dec. 31, 2017, we have an available German net operating loss carryforward of \$145 million with an indefinite life. We believe it is more likely than not that we will fully realize our deferred tax assets.

The U.S. tax legislation provides a one-time deemed repatriation tax on undistributed foreign earnings and profits (“repatriation tax”). In 2017, we recorded \$723 million provisional repatriation tax.

Management continues to evaluate the impact of the U.S. tax legislation on its foreign earnings and related repatriation tax. As of Dec. 31, 2017, we had approximately \$200 million of earnings attributable to foreign subsidiaries that have been permanently reinvested abroad and for which no local distribution tax provision has been recorded. If these earnings were to be repatriated, the estimated tax liability as of Dec. 31, 2017 would be up to \$40 million. The amount of foreign earnings considered permanently reinvested may change once our analysis is completed in the second half of 2018.

The statutory federal income tax rate is reconciled to our effective income tax rate below:

Effective tax rate	Year ended Dec. 31,		
	2017	2016	2015
Federal rate	35.0%	35.0%	35.0%
State and local income taxes, net of federal income tax benefit	1.8	1.6	0.6
Foreign operations	(4.2)	(5.6)	(6.6)
Tax credits	(3.7)	(2.2)	(1.4)
Tax-exempt income	(1.9)	(1.8)	(2.5)
Leverage lease adjustment	(1.4)	(0.9)	(1.3)
Stock compensation	(1.1)	—	—
U.S. tax legislation	(13.3)	—	—
Other – net	(0.4)	(1.2)	0.1
Effective tax rate	10.8%	24.9%	23.9%

Unrecognized tax positions (in millions)	2017	2016	2015
Beginning balance at Jan. 1, – gross	\$ 146	\$ 649	\$ 669
Prior period tax positions:			
Increases	20	8	13
Decreases	(4)	(40)	(21)
Current period tax positions	10	16	14
Settlements	(44)	(477)	(26)
Statute expiration	—	(10)	—
Ending balance at Dec. 31, – gross	\$ 128	\$ 146	\$ 649

Our total tax reserves as of Dec. 31, 2017 were \$128 million compared with \$146 million at Dec. 31, 2016. If these tax reserves were unnecessary, \$128 million would affect the effective tax rate in future periods. We recognize accrued interest and penalties, if applicable, related to income taxes in income tax expense. Included in the balance sheet at Dec. 31, 2017 is accrued interest, where applicable, of \$17 million. The additional tax expense related to interest for the year ended Dec. 31, 2017 was \$12 million, compared with \$2 million for the year ended Dec. 31, 2016.

It is reasonably possible the total reserve for uncertain tax positions could decrease within the next 12 months by approximately \$7 million as a result of adjustments related to tax years that are still subject to examination.

Our federal income tax returns are closed to examination through 2013. Our New York State, New York City and UK income tax returns are closed to examination through 2012.

Note 11 - Long-term debt

Long-term debt (in millions)	Dec. 31, 2017			Dec. 31, 2016	
	Rate	Maturity	Amount	Rate	Amount
Senior debt:					
Fixed rate	1.30 - 5.45%	2018 - 2028	\$ 23,329	1.30 - 5.94%	\$ 20,005
Floating rate	1.49 - 2.74%	2018 - 2038	2,829	0.80 - 2.05%	2,828
Subordinated debt (a)	3.00 - 7.50%	2018 - 2029	1,821	3.00 - 7.50%	1,383
Junior subordinated debentures (b)	N/A	N/A	—	1.87%	247
Total			\$ 27,979		\$ 24,463

(a) Fixed rate.

(b) Floating rate at Dec. 31, 2016.

Total long-term debt maturing during the next five years for BNY Mellon is as follows: 2018 – \$3.7 billion, 2019 – \$4.3 billion, 2020 – \$4.0 billion, 2021 – \$4.3 billion and 2022 – \$1.3 billion.

Trust-preferred securities

On March 20, 2017, all outstanding trust preferred securities issued by Mellon Capital III were redeemed. The redemption price for the trust preferred securities was equal to the par value plus interest accrued up to and excluding March 20, 2017. There were no trust-preferred securities outstanding at Dec. 31, 2017. At Dec. 31, 2016, trust-preferred securities outstanding were \$247 million.

Note 12 - Variable interest entities and securitization

BNY Mellon has variable interests in VIEs, which include investments in retail, institutional and alternative investment funds, including CLO structures in which we provide asset management services, some of which are consolidated. The investment funds are offered to our retail and institutional clients to provide them with access to investment vehicles with specific investment objectives and strategies that address the client's investment needs.

BNY Mellon earns management fees from these funds as well as performance fees in certain funds and may also provide start-up capital for its new funds. The funds are primarily financed by our customers' investments in the funds' equity or debt.

Additionally, BNY Mellon invests in qualified affordable housing and renewable energy projects, which are designed to generate a return primarily through the realization of tax credits by the Company. The projects, which are structured as limited partnerships and LLCs, are also VIEs, but are not consolidated.

The VIEs previously discussed are included in the scope of ASU 2015-02 and are reviewed for consolidation based on the guidance in ASC 810, *Consolidation*. We reconsider and reassess whether or not we are the primary beneficiary of a VIE when governing documents or contractual arrangements are changed that would reallocate the obligation to absorb expected losses or receive expected residual returns between BNY Mellon and the other investors. This could occur when BNY Mellon disposes of its variable interests in the fund, when additional variable interests are issued to other investors or when we acquire additional variable interests in the VIE.

The following table presents the incremental assets and liabilities included in BNY Mellon's consolidated financial statements, after applying intercompany eliminations, as of Dec. 31, 2017 and Dec. 31, 2016. The net assets of any consolidated VIE are solely available to settle the liabilities of the VIE and to settle any investors' ownership liquidation requests, including any seed capital invested in the VIE by BNY Mellon.

Consolidated investments

(in millions)	Dec. 31, 2017			Dec. 31, 2016		
	Investment Management funds	Securitization	Total consolidated investments	Investment Management funds	Securitization	Total consolidated investments
Securities - Available-for-sale	\$ —	\$ 400	\$ 400	\$ —	\$ 400	\$ 400
Trading assets	516	—	516	979	—	979
Other assets	215	—	215	252	—	252
Total assets	\$ 731 (a)	\$ 400	\$ 1,131	\$ 1,231 (b)	\$ 400	\$ 1,631
Trading liabilities	\$ —	\$ —	\$ —	\$ 282	\$ —	\$ 282
Other liabilities	2	367	369	33	363	396
Total liabilities	\$ 2 (a)	\$ 367	\$ 369	\$ 315 (b)	\$ 363	\$ 678
Nonredeemable noncontrolling interests	\$ 316 (a)	\$ —	\$ 316	\$ 618 (b)	\$ —	\$ 618

(a) Includes VMEs with assets of \$84 million, liabilities of \$1 million and nonredeemable noncontrolling interests of \$1 million.

(b) Includes VMEs with assets of \$114 million, liabilities of \$3 million and nonredeemable noncontrolling interests of \$25 million.

BNY Mellon has not provided financial or other support that was not otherwise contractually required to be provided to our VIEs. Additionally, creditors of any consolidated VIEs do not have any recourse to the general credit of BNY Mellon.

Non-consolidated VIEs

As of Dec. 31, 2017 and Dec. 31, 2016, the following assets and liabilities related to the VIEs where BNY Mellon is not the primary beneficiary are included in our consolidated financial statements and primarily relate to accounting for our investments in qualified affordable housing and renewable energy projects.

Non-consolidated VIEs

(in millions)	Dec. 31, 2017			Dec. 31, 2016		
	Assets	Liabilities	Maximum loss exposure	Assets	Liabilities	Maximum loss exposure
Securities - Available-for-sale (a)	\$ 203	\$ —	\$ 203	\$ 42	\$ —	\$ 42
Other	2,592	486	3,078	2,400	369	2,769

(a) Investments in the Company's sponsored CLOs.

The maximum loss exposure indicated in the above table relates solely to BNY Mellon's investments in, and unfunded commitments to, the VIEs.

Note 13 - Shareholders' equity
Common stock

BNY Mellon has 3.5 billion authorized shares of common stock with a par value of \$0.01 per share. At Dec. 31, 2017, 1,013,442,445 shares of common stock were outstanding.

Common stock repurchase program

On June 29, 2016, in connection with the Federal Reserve's non-objection to our 2016 capital plan, BNY Mellon announced a new stock purchase program providing for the repurchase of an aggregate of \$2.7 billion of common stock. The 2016 capital plan began in the third quarter of 2016 and continued

through the second quarter of 2017. On June 28, 2017, in connection with the Federal Reserve's non-objection to our 2017 capital plan, BNY Mellon announced a share repurchase plan providing for the repurchase of up to \$2.6 billion of common stock. The 2017 capital plan began in the third quarter of 2017 and continues through the second quarter of 2018. This new share repurchase plan replaces all previously authorized share repurchase plans.

Share repurchases may be executed through repurchase plans designed to comply with Rule 10b5-1 and through derivative, accelerated share repurchase and other structured transactions. In 2017, we repurchased 54.5 million common shares at an average price of \$49.28 per common share for a total of \$2.7 billion. At Dec. 31, 2017, the maximum dollar value of shares that may yet be purchased under the June 28, 2017 program, including employee benefit plan repurchases, totaled \$1.3 billion.

Preferred stock

BNY Mellon has 100 million authorized shares of preferred stock with a par value of \$0.01 per share. The following table summarizes BNY Mellon's preferred stock issued and outstanding at Dec. 31, 2017 and Dec. 31, 2016.

Preferred stock summary (a)		Total shares issued and outstanding		Carrying value (b)	
		Dec. 31, 2017	Dec. 31, 2016	<i>(in millions)</i>	
Per annum dividend rate				Dec. 31, 2017	Dec. 31, 2016
Series A (c)	Greater of (i) three-month LIBOR plus 0.565% for the related distribution period; or (ii) 4.000%	5,001	5,001	\$ 500	\$ 500
Series C	5.2%	5,825	5,825	568	568
Series D	4.50% to but excluding June 20, 2023, then a floating rate equal to the three-month LIBOR plus 2.46%	5,000	5,000	494	494
Series E	4.95% to and including June 20, 2020, then a floating rate equal to the three-month LIBOR plus 3.42%	10,000	10,000	990	990
Series F	4.625% to and including Sept. 20, 2026, then a floating rate equal to the three-month LIBOR plus 3.131%	10,000	10,000	990	990
Total		35,826	35,826	\$ 3,542	\$ 3,542

(a) All outstanding preferred stock is noncumulative perpetual preferred stock with a liquidation preference of \$100,000 per share.

(b) The carrying value of the Series C, Series D, Series E and Series F preferred stock is recorded net of issuance costs.

(c) Series A preferred stock is the sole asset of Mellon Capital IV, a Delaware statutory trust owned by BNY Mellon Capital IV.

Holders of both the Series A and Series C preferred stock are entitled to receive dividends on each dividend payment date (March 20, June 20, September 20 and December 20 of each year), if declared by BNY Mellon's Board of Directors.

Holders of the Series D preferred stock are entitled to receive dividends, if declared by BNY Mellon's Board of Directors, on each June 20 and December 20, to but excluding June 20, 2023; and on each March 20, June 20, September 20 and December 20, from and including June 20, 2023. Holders of the Series E preferred stock are entitled to receive dividends, if declared by BNY Mellon's Board of Directors, on each June 20 and December 20, to and including June 20, 2020; and on each March 20, June 20, September 20 and December 20, from and including September 20, 2020. Holders of the Series F preferred stock are entitled to receive dividends, if declared by BNY Mellon's Board of Directors, on each March 20 and September 20, commencing March 20, 2017, to and including Sept. 20, 2026; and on each March 20, June 20, September 20 and December 20, commencing Dec. 20, 2026. BNY Mellon's ability to declare or pay dividends on, or purchase, redeem or otherwise acquire, shares of our common stock or any of our shares that rank junior to the preferred stock as to the payment of dividends and/or the distribution of any assets on any liquidation, dissolution or winding-up of BNY Mellon will be prohibited, subject to certain

restrictions, in the event that we do not declare and pay in full preferred dividends for the then current dividend period of the Series A preferred stock or the last preceding dividend period of the Series C, Series D, Series E and Series F preferred stock.

All of the outstanding shares of the Series A preferred stock are owned by Mellon Capital IV, which will pass through any dividend on the Series A preferred stock to the holders of its Normal Preferred Capital Securities. All of the outstanding shares of the Series C, Series D, Series E and Series F preferred stock are held by the depositary of the depositary shares, which will pass through the applicable portion of any dividend on the Series C, Series D, Series E and Series F preferred stock to the holders of record of their respective depositary shares.

On Dec. 20, 2017, The Bank of New York Mellon Corporation paid the following dividends for the noncumulative perpetual preferred stock for the dividend period ending in December 2017 to holders of record as of the close of business on Dec. 5, 2017:

- \$1,011.11 per share on the Series A Preferred Stock (equivalent to \$10.1111 per Normal Preferred Capital Security of Mellon Capital IV, each representing a 1/100th interest in a share of the Series A Preferred Stock);

- \$1,300.00 per share on the Series C Preferred Stock (equivalent to \$0.3250 per depositary share, each representing a 1/4,000th interest in a share of the Series C Preferred Stock);
- \$2,250.00 per share on the Series D Preferred Stock (equivalent to \$22.5000 per depositary share, each representing a 1/100th interest in a share of the Series D Preferred Stock); and
- \$2,475.00 per share on the Series E Preferred Stock (equivalent to \$24.7500 per depositary share, each representing a 1/100th interest in a share of the Series E Preferred Stock).

The preferred stock is not subject to the operation of a sinking fund and is not convertible into, or exchangeable for, shares of our common stock or any other class or series of our other securities. We may redeem the Series A or Series C preferred stock, in whole or in part, at our option. We may also, at our option, redeem the shares of the Series D preferred stock, in whole or in part, on or after the dividend payment date in June 2023, the Series E preferred stock, in whole or in part, on or after the dividend payment date in June 2020, and the Series F preferred stock, in whole or in part, on or after the dividend payment date in September 2026. The Series C, Series D, Series E or Series F preferred stock can be redeemed, in whole but not in part, at any time within 90 days following a regulatory capital treatment event (as defined in each of the Series C, Series D, Series E and Series F's Certificates of Designation). Redemption of the preferred stock is subject to the prior approval of the Federal Reserve.

Terms of the Series A, Series C, Series D, Series E and Series F preferred stock are more fully described in each of their Certificates of Designations, each of which is filed as an Exhibit to BNY Mellon's Annual Report on Form 10-K for the year ended Dec. 31, 2017.

Temporary equity

Temporary equity was \$179 million at Dec. 31, 2017 and \$151 million at Dec. 31, 2016. Temporary equity represents amounts recorded for redeemable noncontrolling interests resulting from equity-classified share-based payment arrangements that are currently redeemable or are expected to become redeemable. The current redemption value of such awards is classified as temporary equity and is

adjusted to its redemption value at each balance sheet date.

Capital adequacy

Regulators establish certain levels of capital for BHCs and banks, including BNY Mellon and our bank subsidiaries, in accordance with established quantitative measurements. For the Parent to maintain its status as a FHC, our bank subsidiaries and BNY Mellon must, among other things, qualify as "well capitalized."

As of Dec. 31, 2017 and Dec. 31, 2016, BNY Mellon and our U.S. bank subsidiaries were "well capitalized."

Our consolidated and largest bank subsidiary, The Bank of New York Mellon, regulatory capital ratios are shown below.

Consolidated and largest bank subsidiary regulatory capital ratios (a)	Dec. 31,	
	2017	2016
Consolidated regulatory capital ratios:		
CET1	10.7%	10.6%
Tier 1 capital ratio	12.7	12.6
Total (Tier 1 plus Tier 2) capital ratio	13.4	13.0
Leverage capital ratio	6.6	6.6
The Bank of New York Mellon regulatory capital ratios:		
CET1	14.1%	13.6%
Tier 1 capital ratio	14.4	13.9
Total (Tier 1 plus Tier 2) capital ratio	14.7	14.2
Leverage capital ratio	7.6	7.2

(a) For our CET1, Tier 1 and Total capital ratios, our effective capital ratios under U.S. capital rules are the lower of the ratios as calculated under the Standardized and Advanced Approaches. The leverage capital ratio is based on Tier 1 capital, as phased-in and quarterly average total assets. For BNY Mellon to qualify as "well capitalized," its Tier 1 and Total (Tier 1 plus Tier 2) capital ratios must be at least 6% and 10%, respectively. For The Bank of New York Mellon, our largest bank subsidiary, to qualify as "well capitalized," its CET1, Tier 1, Total and leverage capital ratios must be at least 6.5%, 8%, 10% and 5%, respectively.

Failure to satisfy regulatory standards, including "well capitalized" status or capital adequacy rules more generally, could result in limitations on our activities and adversely affect our financial condition. If a BHC such as BNY Mellon or bank such as The Bank of New York Mellon or BNY Mellon, N.A. fails to qualify as "adequately capitalized," regulatory sanctions and limitations are imposed.

The following table presents the components of our transitional CET1, Tier 1 and Tier 2 capital, the risk-weighted assets determined under the Standardized and Advanced Approaches and the average assets used for leverage capital purposes.

Components of transitional capital <i>(a)</i> <i>(in millions)</i>	Dec. 31,	
	2017	2016
CET1:		
Common shareholders' equity	\$ 37,859	\$ 35,794
Goodwill and intangible assets	(18,684)	(17,314)
Net pension fund assets	(169)	(55)
Equity method investments	(372)	(313)
Deferred tax assets	(33)	(19)
Other	(8)	—
Total CET1	18,593	18,093
Other Tier 1 capital:		
Preferred stock	3,542	3,542
Disallowed deferred tax assets	(8)	(13)
Net pension fund assets	(42)	(36)
Other	(41)	(121)
Total Tier 1 capital	\$ 22,044	\$ 21,465
Tier 2 capital:		
Subordinated debt	\$ 1,250	\$ 550
Allowance for credit losses	261	281
Trust preferred securities	—	148
Other	(12)	(12)
Total Tier 2 capital – Standardized Approach	1,499	967
Excess of expected credit losses	31	50
Less: Allowance for credit losses	261	281
Total Tier 2 capital – Advanced Approach	\$ 1,269	\$ 736
Total capital:		
Standardized Approach	\$ 23,543	\$ 22,432
Advanced Approach	\$ 23,313	\$ 22,201
Risk-weighted assets:		
Standardized Approach	\$ 155,621	\$ 147,671
Advanced Approach:		
Credit Risk	\$ 101,681	\$ 97,659
Market Risk	3,657	2,836
Operational Risk	68,688	70,000
Total Advanced Approach	\$ 174,026	\$ 170,495
Average assets for leverage capital purposes	\$ 331,600	\$ 326,809

(a) Reflects transitional adjustments to CET1, Tier 1 capital and Tier 2 capital required in 2017 and 2016 under the U.S. capital rules.

The following table presents the amount of capital by which BNY Mellon and our largest bank subsidiary, The Bank of New York Mellon, exceeded the capital thresholds determined under the transitional rules.

<i>(in millions)</i>	Capital above thresholds at Dec. 31, 2017	
	Consolidated	The Bank of New York Mellon <i>(b)</i>
CET1	\$ 7,281 <i>(a)</i>	\$ 10,848
Tier 1 capital	8,122 <i>(a)</i>	9,112
Total capital	5,910 <i>(b)</i>	6,717
Leverage capital	8,780 <i>(a)</i>	7,001

(a) Based on minimum required standards, with applicable buffers.

(b) Based on well capitalized standards.

Note 14 - Other comprehensive income (loss)

Components of other comprehensive income (loss)	Year ended Dec. 31,								
	2017			2016			2015		
	Pre-tax amount	Tax (expense) benefit	After-tax amount	Pre-tax amount	Tax (expense) benefit	After-tax amount	Pre-tax amount	Tax (expense) benefit	After-tax amount
<i>(in millions)</i>									
Foreign currency translation:									
Foreign currency translation adjustments arising during the period (a)	\$ 659	\$ 194	\$ 853	\$ (518)	\$ (332)	\$ (850)	\$ (518)	\$ (81)	\$ (599)
Total foreign currency translation	659	194	853	(518)	(332)	(850)	(518)	(81)	(599)
Unrealized gain (loss) on assets available-for-sale:									
Unrealized gain (loss) arising during period	237	(84)	153	(388)	146	(242)	(535)	172	(363)
Reclassification adjustment (b)	(3)	—	(3)	(75)	26	(49)	(83)	31	(52)
Net unrealized gain (loss) on assets available-for-sale	234	(84)	150	(463)	172	(291)	(618)	203	(415)
Defined benefit plans:									
Net gain (loss) arising during the period	454	(112)	342	(151)	43	(108)	(105)	40	(65)
Foreign exchange adjustment	1	—	1	(1)	1	—	—	—	—
Amortization of prior service credit, net loss and initial obligation included in net periodic benefit cost (b)	100	(32)	68	88	(31)	57	104	(35)	69
Total defined benefit plans	555	(144)	411	(64)	13	(51)	(1)	5	4
Unrealized gain (loss) on cash flow hedges:									
Unrealized hedge gain (loss) arising during period	33	(9)	24	(52)	18	(34)	—	—	—
Reclassification adjustment (b)	(20)	5	(15)	45	(15)	30	11	(3)	8
Net unrealized gain (loss) on cash flow hedges	13	(4)	9	(7)	3	(4)	11	(3)	8
Total other comprehensive income (loss)	\$ 1,461	\$ (38)	\$ 1,423	\$ (1,052)	\$ (144)	\$ (1,196)	\$ (1,126)	\$ 124	\$ (1,002)

(a) Includes the impact of hedges of net investments in foreign subsidiaries. See Note 21 for additional information.

(b) The reclassification adjustment related to the unrealized gain (loss) on assets available-for-sale is recorded as net securities gains on the Consolidated Income Statement. The amortization of prior service credit, net loss and initial obligation included in net periodic benefit cost is recorded as staff expense on the Consolidated Income Statement. See Note 16 of the Notes to Consolidated Financial Statements for the location of the reclassification adjustment related to cash flow hedges on the Consolidated Income Statement.

Changes in accumulated other comprehensive income (loss) attributable to The Bank of New York Mellon Corporation shareholders

<i>(in millions)</i>	Foreign currency translation	ASC 820 Adjustments		Unrealized gain (loss) on assets available-for-sale	Unrealized gain (loss) on cash flow hedges	Total accumulated other comprehensive income (loss), net of tax
		Pensions	Other post-retirement benefits			
2014 ending balance	\$ (1,069)	\$ (1,236)	\$ (65)	\$ 742	\$ (6)	\$ (1,634)
Change in 2015	(563)	(14)	18	(415)	8	(966)
2015 ending balance	\$ (1,632)	\$ (1,250)	\$ (47)	\$ 327	\$ 2	\$ (2,600)
Change in 2016	(819)	(56)	5	(291)	(4)	(1,165)
2016 ending balance	\$ (2,451)	\$ (1,306)	\$ (42)	\$ 36	\$ (2)	\$ (3,765)
Change in 2017	838	419	(8)	150	9	1,408
2017 ending balance	\$ (1,613)	\$ (887)	\$ (50)	\$ 186	\$ 7	\$ (2,357)

Note 15 - Stock-based compensation

Our Long-Term Incentive Plans provide for the issuance of stock options, restricted stock, restricted stock units (“RSUs”) and other stock-based awards to employees and directors of BNY Mellon. At Dec. 31, 2017, under the Long-Term Incentive Plan approved in April 2014, we may issue 27,998,933 new stock-based awards. Of this amount, 13,258,636 shares (subject to potential increase as provided in the Long-Term Incentive Plan) may be issued as restricted

stock or RSUs. Stock-based compensation expense related to retirement eligibility vesting totaled \$109 million in 2017, \$106 million in 2016 and \$97 million in 2015.

Stock options

Our Long-Term Incentive Plans provide for the issuance of stock options at fair market value at the date of grant to officers and employees of BNY Mellon. Generally, each option granted is exercisable

between one and 10 years from the date of grant. No stock options were granted in 2017, 2016 and 2015.

There was no compensation cost charged against income in 2017. Compensation costs that were charges against income were \$2 million in 2016 and

\$10 million in 2015. There was no income tax benefit recognized in the income statement in 2017. Total income tax benefit recognized in the income statement was \$1 million in 2016 and \$4 million in 2015.

A summary of the status of our options as of Dec. 31, 2017, and changes during the year, is presented below:

Stock option activity	Shares subject to option	Weighted-average exercise price	Weighted-average remaining contractual term (in years)
Balance at Dec. 31, 2016	21,241,568	\$ 32.57	2.8
Granted	—	—	
Exercised	(11,778,373)	36.66	
Canceled/Expired	(161,055)	39.10	
Balance at Dec. 31, 2017	9,302,140	\$ 27.27	2.7
Vested and expected to vest at Dec. 31, 2017	9,302,140	27.27	2.7
Exercisable at Dec. 31, 2017	9,302,140	27.27	2.7

Range of exercise prices	Options outstanding			Options exercisable (a)		
	Outstanding	Weighted-average remaining contractual life (in years)	Weighted-average exercise price	Exercisable	Weighted-average exercise price	
\$ 18 to 31	8,544,242	2.9	\$ 25.68	8,544,242	\$ 25.68	
\$ 31 to 41	13,908	0.5	35.52	13,908	35.52	
\$ 41 to 51	743,990	0.1	45.39	743,990	45.39	
\$ 18 to 51	9,302,140	2.7	\$ 27.27	9,302,140	\$ 27.27	

(a) At Dec. 31, 2016 and Dec. 31, 2015, 21,241,568 and 33,703,283 options were exercisable at a weighted-average price per common share of \$32.57 and \$34.27, respectively.

Aggregate intrinsic value of options (in millions)	2017	2016	2015
Outstanding at Dec. 31,	\$ 247	\$ 315	\$ 306
Exercisable at Dec. 31,	\$ 247	\$ 315	\$ 267

The total intrinsic value of options exercised was \$159 million in 2017, \$122 million in 2016 and \$130 million in 2015.

Cash received from option exercises totaled \$431 million in 2017, \$438 million in 2016 and \$326 million in 2015. The actual excess tax benefit realized for the tax deductions from options exercised totaled \$16 million in 2017, \$3 million in 2016 and \$21 million in 2015.

Restricted stock, RSUs and Performance units

Restricted stock and RSUs are granted under our long-term incentive plans at no cost to the recipient.

These awards are subject to forfeiture until certain restrictions have lapsed, including continued employment, for a specified period. The recipient of a share of restricted stock is entitled to voting rights and generally is entitled to dividends on the common stock. An RSU entitles the recipient to receive a share of common stock after the applicable restrictions lapse. The recipient generally is entitled to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSU is outstanding but does not receive voting rights.

The fair value of restricted stock and RSUs is equal to the fair market value of our common stock on the date of grant. The expense is recognized over the vesting period, which is generally zero to four years. The total compensation expense recognized for restricted stock and RSUs was \$273 million in 2017, \$256 million in 2016 and \$235 million in 2015. The total income tax benefit recognized in the income

statement was \$66 million in 2017, \$91 million in 2016 and \$83 million in 2015.

BNY Mellon's Executive Committee members were granted a target award of 793,847 performance units ("PSUs") in 2017, 548,391 in 2016 and 630,100 in 2015 that cliff vest in 3 years based on operating earnings per share with the potential of a risk modifier based on appropriate growth in risk-weighted assets. These awards are classified as liabilities and marked-to-market as the earnout percentages are determined at the discretion of the Human Resources Compensation Committee based on a payout table.

The following table summarizes our non-vested PSU, restricted stock and RSU activity for 2017.

Non-vested PSU, restricted stock and RSU activity	Number of shares	Weighted-average fair value
Non-vested PSUs, restricted stock and RSUs at Dec. 31, 2016	17,995,515	\$ 35.98
Granted	6,725,625	48.71
Vested	(7,510,459)	34.39
Forfeited	(479,349)	38.79
Non-vested PSUs, restricted stock and RSUs at Dec. 31, 2017	16,731,332	\$ 42.42

As of Dec. 31, 2017, \$224 million of total unrecognized compensation costs related to non-vested PSUs, restricted stock and RSUs is expected to be recognized over a weighted-average period of 2.1 years.

The total fair value of restricted stock, RSUs and PSUs that vested was \$260 million in 2017, \$236 million in 2016 and \$429 million in 2015. The actual excess tax benefit realized for the tax deductions from shares vested totaled \$34 million in 2017, \$8 million in 2016 and \$51 million in 2015.

Subsidiary Long-Term Incentive Plans

BNY Mellon also has several subsidiary Long-Term Incentive Plans which have issued restricted subsidiary shares to certain employees. These share awards are subject to forfeiture until certain restrictions have lapsed, including continued employment for a specified period of time. The shares are non-voting and non-dividend paying. Once the restrictions lapse, which generally occurs in three to five years, the shares can only be sold, at the option of the employee, to BNY Mellon at a price based generally on the fair value of the subsidiary at the time of repurchase. In certain instances BNY Mellon has an election to call the shares.

Note 16 - Employee benefit plans

BNY Mellon has defined benefit and/or defined contribution retirement plans covering substantially all full-time and eligible part-time employees and other post-retirement plans providing healthcare benefits for certain retired employees. Effective June 30, 2015, the benefit accruals under the U.S. qualified and nonqualified defined benefit plans were frozen. This change resulted in no additional benefits being earned by participants in those plans based on service or pay after June 30, 2015.

Pension and post-retirement healthcare plans

The following tables report the combined data for our domestic and foreign defined benefit pension and post-retirement healthcare plans.

	Pension Benefits				Healthcare Benefits			
	Domestic		Foreign		Domestic		Foreign	
	2017	2016	2017	2016	2017	2016	2017	2016
<i>(dollar amounts in millions)</i>								
Weighted-average assumptions used to determine benefit obligations								
Discount rate	3.97%	4.35%	2.45%	2.53%	3.97%	4.35%	2.50%	2.60%
Rate of compensation increase	N/A	N/A	3.02	3.60	3.00	3.00	N/A	N/A
Change in benefit obligation (a)								
Benefit obligation at beginning of period	\$ (4,274)	\$ (4,177)	\$ (1,248)	\$ (1,147)	\$ (169)	\$ (184)	\$ (2)	\$ (4)
Service cost	—	—	(31)	(29)	(1)	(1)	—	—
Interest cost	(180)	(182)	(33)	(36)	(7)	(8)	—	—
Employee contributions	—	—	(1)	(1)	—	—	—	—
Actuarial (loss) gain	(165)	(106)	88	(221)	(10)	9	(1)	1
Benefits paid	214	191	31	23	12	15	—	—
Foreign exchange adjustment	N/A	N/A	(128)	163	N/A	N/A	(1)	1
Benefit obligation at end of period	(4,405)	(4,274)	(1,322)	(1,248)	(175)	(169)	(4)	(2)
Change in fair value of plan assets								
Fair value at beginning of period	4,906	4,689	1,090	1,014	97	92	—	—
Actual return on plan assets	783	387	128	162	10	5	—	—
Employer contributions	21	21	93	87	12	15	—	—
Employee contributions	—	—	1	1	—	—	—	—
Benefit payments	(214)	(191)	(31)	(23)	(12)	(15)	—	—
Foreign exchange adjustment	N/A	N/A	112	(151)	N/A	N/A	—	—
Fair value at end of period	5,496	4,906	1,393	1,090	107	97	—	—
Funded status at end of period	\$ 1,091	\$ 632	\$ 71	\$ (158)	\$ (68)	\$ (72)	\$ (4)	\$ (2)
Amounts recognized in accumulated other comprehensive (income) loss consist of:								
Net loss (gain)	\$ 1,294	\$ 1,656	\$ 255	\$ 461	\$ 97	\$ 96	\$ (1)	\$ (2)
Prior service cost (credit)	—	—	1	—	(49)	(59)	—	—
Total (before tax effects)	\$ 1,294	\$ 1,656	\$ 256	\$ 461	\$ 48	\$ 37	\$ (1)	\$ (2)

(a) The benefit obligation for pension benefits is the projected benefit obligation, and for healthcare benefits, it is the accumulated benefit obligation.

	Pension Benefits						Healthcare Benefits					
	Domestic			Foreign			Domestic			Foreign		
	2017	2016	2015 (a)	2017	2016	2015	2017	2016	2015	2017	2016	2015
<i>(dollar amounts in millions)</i>												
Weighted-average assumptions as of Jan. 1:												
Market-related value of plan assets	\$ 5,026	\$ 4,830	\$ 4,696	\$ 994	\$ 994	\$ 959	\$ 102	\$ 97	\$ 92	N/A	N/A	N/A
Discount rate	4.35%	4.48%	4.13%	2.53%	3.45%	3.33%	4.35%	4.48%	4.13%	2.60%	3.60%	3.10%
Expected rate of return on plan assets	6.625	7.00	7.25	4.61	5.35	5.25	6.625	7.00	7.25	N/A	N/A	N/A
Rate of compensation increase	N/A	N/A	3.00	3.60	3.51	3.29	3.00	3.00	3.00	N/A	N/A	N/A
Components of net periodic benefit cost (credit):												
Service cost	\$ —	\$ —	\$ 30	\$ 31	\$ 29	\$ 32	\$ 1	\$ 1	\$ 1	\$ —	\$ —	\$ —
Interest cost	180	182	170	33	36	38	7	8	8	—	—	—
Expected return on assets	(325)	(330)	(333)	(50)	(51)	(51)	(7)	(7)	(6)	—	—	—
Amortization of:												
Prior service (credit) cost	—	—	(1)	—	1	—	(10)	(10)	(10)	—	—	—
Net actuarial loss	67	69	111	35	17	23	6	8	10	—	—	—
Settlement loss	2	2	1	—	1	—	—	—	—	—	—	—
Curtailment (gain)	—	—	(30)	—	—	—	—	—	—	—	—	—
Net periodic benefit cost (credit)	\$ (76)	\$ (77)	\$ (52)	\$ 49	\$ 33	\$ 42	\$ (3)	\$ —	\$ 3	\$ —	\$ —	\$ —

(a) As a result of the amendment to the U.S. pension plans, liabilities were re-measured as of Jan. 29, 2015 at a discount rate of 3.73% and the market-related value of plan assets was \$4,713 million at Jan. 29, 2015.

Changes in other comprehensive (income) loss in 2017 <i>(in millions)</i>	Pension Benefits		Healthcare Benefits	
	Domestic	Foreign	Domestic	Foreign
Net loss (gain) arising during period	\$ (293)	\$ (169)	\$ 7	\$ 1
Recognition of prior years' net (loss)	(69)	(35)	(6)	—
Recognition of prior years' service (cost) credit	—	—	10	—
Foreign exchange adjustment	N/A	(1)	N/A	—
Total recognized in other comprehensive (income) loss (before tax effects)	\$ (362)	\$ (205)	\$ 11	\$ 1

Amounts expected to be recognized in net periodic benefit cost (income) in 2018 (before tax effects) <i>(in millions)</i>	Pension Benefits		Healthcare Benefits	
	Domestic	Foreign	Domestic	Foreign
Loss recognition	\$ 68	\$ 22	\$ 7	\$ —
Prior service (credit) recognition	—	—	(9)	—

<i>(in millions)</i>	Domestic		Foreign	
	2017	2016	2017	2016
Pension benefits:				
Prepaid benefit cost	\$ 1,282	\$ 836	\$ 134	\$ —
Accrued benefit cost	(191)	(204)	(63)	(158)
Total pension benefits	\$ 1,091	\$ 632	\$ 71	(158)
Healthcare benefits:				
Accrued benefit cost	\$ (68)	\$ (72)	\$ (4)	\$ (4)
Total healthcare benefits	\$ (68)	\$ (72)	\$ (4)	\$ (4)

The accumulated benefit obligation for all defined benefit plans was \$5.7 billion at Dec. 31, 2017 and \$5.4 billion at Dec. 31, 2016.

Plans with obligations in excess of plan assets <i>(in millions)</i>	Domestic		Foreign	
	2017	2016	2017	2016
Projected benefit obligation	\$ 191	\$ 224	\$ 68	\$ 149
Accumulated benefit obligation	191	224	61	142
Fair value of plan assets	—	20	25	76

Assumed healthcare cost trend - Domestic post-retirement healthcare benefits

The assumed healthcare cost trend rate used in determining benefit expense for 2018 is 6.25%, decreasing to 4.75% in 2023. This projection is based on various economic models that forecast a decreasing growth rate of healthcare expenses over

time. The underlying assumption is that healthcare expense growth cannot outpace gross national product growth indefinitely, and over time a lower equilibrium growth rate will be achieved. Further, the growth rate assumed in 2023 bears a reasonable relationship to the discount rate.

An increase in the healthcare cost trend rate of one percentage point for each year would increase the accumulated post-retirement benefit obligation by \$10 million, or 6%, and the sum of the service and interest costs by less than \$1 million, or 6%. Conversely, a decrease in this rate of one percentage point for each year would decrease the benefit obligation by \$9 million, or 5%, and the sum of the service and interest costs by less than \$1 million, or 5%.

Assumed healthcare cost trend - Foreign post-retirement healthcare benefits

An increase in the healthcare cost trend rate of one percentage point for each year would increase the accumulated post-retirement benefit obligation by less than \$1 million and the sum of the service and interest costs by less than \$1 million. Conversely, a decrease in this rate of one percentage point for each year would decrease the benefit obligation by less than \$1 million and the sum of the service and interest costs by less than \$1 million.

The following benefit payments for BNY Mellon's pension and healthcare plans, which reflect expected future service as appropriate, are expected to be paid over the next 10 years:

Expected benefit payments			
<i>(in millions)</i>		Domestic	Foreign
Pension benefits:			
Year	2018	\$ 280	\$ 20
	2019	262	19
	2020	260	19
	2021	262	22
	2022	259	23
	2023-2027	1,303	137
Total pension benefits		\$ 2,626	\$ 240
Healthcare benefits:			
Year	2018	\$ 13	\$ —
	2019	13	—
	2020	13	—
	2021	13	—
	2022	12	—
	2023-2027	55	1
Total healthcare benefits		\$ 119	\$ 1

Plan contributions

BNY Mellon expects to make cash contributions to fund its defined benefit pension plans in 2018 of \$32 million for the domestic plans and \$22 million for the foreign plans.

BNY Mellon expects to make cash contributions to fund its post-retirement healthcare plans in 2018 of \$13 million for the domestic plans and less than \$1 million for the foreign plans.

Investment strategy and asset allocation

BNY Mellon is responsible for the administration of various employee pension and healthcare post-retirement benefits plans, both domestically and internationally. The domestic plans are administered by BNY Mellon's Benefits Administration Committee, a named fiduciary. Subject to the following, at all relevant times, BNY Mellon's Benefits Investment Committee, another named fiduciary to the domestic plans, is responsible for the investment of plan assets. The Benefits Investment Committee's responsibilities include the investment of all domestic defined benefit plan assets, as well as the determination of investment options offered to participants in all domestic defined contribution plans. The Benefits Investment Committee conducts periodic reviews of investment performance, asset

allocation and investment manager suitability. In addition, the Benefits Investment Committee has oversight of the Regional Governance Committees for the foreign defined benefit plans.

Our investment objective for U.S. and foreign plans is to maximize total return while maintaining a broadly diversified portfolio for the primary purpose of satisfying obligations for future benefit payments.

Equities are the main holding of the plans. Alternative investments (including private equities) and fixed-income securities provide diversification and, in certain cases, lower the volatility of returns. In general, equity securities and alternative investments within any domestic plan's portfolio can be maintained in the range of 30% to 70% of total plan assets, fixed-income securities can range from 20% to 50% of plan assets and cash equivalents can be held in amounts ranging from 0% to 5% of plan assets. Actual asset allocation within the approved ranges varies from time to time based on economic conditions (both current and forecast) and the advice of professional advisors.

Our pension assets were invested as follows at Dec. 31, 2017 and Dec. 31, 2016:

Asset allocations	Domestic		Foreign	
	2017	2016	2017	2016
Equities	63%	58%	51%	52%
Fixed income	33	36	33	29
Private equities	1	1	—	—
Alternative investment	2	3	9	3
Real estate	—	—	4	4
Cash	1	2	3	12
Total pension benefits	100%	100%	100%	100%

We held no The Bank of New York Mellon Corporation stock in our pension plans at Dec. 31, 2017 and Dec. 31, 2016. Assets of the U.S. post-retirement healthcare plan are invested in an insurance contract.

Fair value measurement of plan assets

In accordance with ASC 715, *Compensation - Retirement Benefits*, BNY Mellon has established a three-level hierarchy for fair value measurements of its pension plan assets based upon the transparency of inputs to the valuation of an asset as of the measurement date. The valuation hierarchy is consistent with guidance in ASC 820, *Fair Value*

Measurement, which is detailed in Note 18 of the Notes to Consolidated Financial Statements.

The following is a description of the valuation methodologies used for assets measured at fair value, as well as the general classification of such assets pursuant to the valuation hierarchy.

Cash and currency

This category consists primarily of foreign currency balances and is included in Level 1 of the valuation hierarchy. Foreign currency is translated monthly based on current exchange rates.

Common and preferred stock, exchange-traded funds and mutual funds

These investments include equities, exchange-traded funds and mutual funds and are valued at the closing price reported in the active market in which the individual securities are traded, if available. Where there are no readily available market quotations, we determine fair value primarily based on pricing sources with reasonable levels of price transparency.

Collective trust funds

Collective trust funds include commingled and U.S. equity funds that have no readily available market quotations. The fair value of the funds is based on the securities in the portfolio, which typically are the amount that the fund might reasonably expect to receive for the securities upon a sale. These funds are valued using observable inputs on either a daily or monthly basis. Collective trust funds are included as Level 2 of the valuation hierarchy.

Fixed-income investments

Fixed-income investments include U.S. Treasury securities, U.S. government agencies, sovereign

government obligations, U.S. corporate bonds and foreign corporate debt funds. U.S. Treasury securities are valued at the closing price reported in the active market in which the individual security is traded and included as Level 1 of the valuation hierarchy. U.S. government agencies, sovereign government obligations, U.S. corporate bonds and foreign corporate debt funds are valued based on quoted prices for comparable securities with similar yields and credit ratings. When quoted prices are not available for identical or similar bonds, the bonds are valued using discounted cash flows that maximize observable inputs, such as current yields of similar instruments, but includes adjustments for certain risks that may not be observable, such as credit and liquidity risks. U.S. government agencies, sovereign government obligations, U.S. corporate bonds and foreign corporate debt funds are primarily included as Level 2 of the valuation hierarchy.

Other assets measured at NAV

Other assets measured at NAV include funds of funds and venture capital and partnership interests, property funds and other funds. There are no readily available market quotations for these funds. The fair value of the funds of funds is based on NAVs of the funds in the portfolio, which reflects the value of the underlying securities. The fair value of the underlying securities is typically the amount that the fund might reasonably expect to receive upon selling those hard to value or illiquid securities within the portfolios. These funds are either valued on a daily or monthly basis. The fair value of the venture capital and partnership interests is based on the pension plan's ownership percentage of the fair value of the underlying funds as provided by the fund managers. These funds are typically valued on a quarterly basis. The pension plan's venture capital and partnership interests are valued at NAV as a practical expedient for fair value.

The following tables present the fair value of each major category of plan assets as of Dec. 31, 2017 and Dec. 31, 2016, by captions and by ASC 820, *Fair Value Measurement*, valuation hierarchy. Beginning in 2017, we refined the methodology used to determine the level of the three-level valuation hierarchy for certain domestic plan assets which resulted in a portion of sovereign debt being transferred from Level 2 to Level 1. Prior period amounts were not adjusted.

Plan assets measured at fair value on a recurring basis—domestic plans at Dec. 31, 2017

<i>(in millions)</i>	Level 1	Level 2	Level 3	Total fair value
Common and preferred stock:				
U.S. equity	\$ 1,815	\$ —	\$ —	\$ 1,815
Non-U.S. equity	243	—	—	243
Collective trust funds:				
Commingled	—	193	—	193
U.S. equity	—	1,389	—	1,389
Fixed income:				
U.S. Treasury securities	452	—	—	452
U.S. government agencies	—	48	—	48
Sovereign government obligations	5	6	—	11
U.S. corporate bonds	—	910	—	910
Other	—	100	—	100
Mutual funds	163	—	—	163
Exchange-traded funds	—	—	—	—
Total domestic plan assets in the fair value hierarchy	\$ 2,678	\$ 2,646	\$ —	\$ 5,324
Other assets measured at NAV:				
Funds of funds				129
Venture capital and partnership interests				43
Total domestic plan assets, at fair value				\$ 5,496

Plan assets measured at fair value on a recurring basis—foreign plans at Dec. 31, 2017

<i>(in millions)</i>	Level 1	Level 2	Level 3	Total fair value
Equity funds	\$ 434	\$ 277	\$ —	\$ 711
Sovereign/government obligation funds	—	104	—	104
Corporate debt funds	—	345	—	345
Cash and currency	41	—	—	41
Total foreign plan assets in the fair value hierarchy	\$ 475	\$ 726	\$ —	\$ 1,201
Other assets measured at NAV				192
Total foreign plan assets, at fair value				\$ 1,393

Plan assets measured at fair value on a recurring basis—domestic plans at Dec. 31, 2016

<i>(in millions)</i>	Level 1	Level 2	Level 3	Total fair value
Common and preferred stock:				
U.S. equity	\$ 1,493	\$ —	\$ —	\$ 1,493
Non-U.S. equity	137	—	—	137
Collective trust funds:				
Commingled	—	367	—	367
U.S. equity	—	1,115	—	1,115
Fixed income:				
U.S. Treasury securities	523	—	—	523
U.S. government agencies	—	66	—	66
Sovereign government obligations	—	7	—	7
U.S. corporate bonds	—	823	—	823
Other	—	48	—	48
Mutual funds	135	—	—	135
Exchange-traded funds	6	—	—	6
Total domestic plan assets in the fair value hierarchy	\$ 2,294	\$ 2,426	\$ —	\$ 4,720
Other assets measured at NAV:				
Funds of funds				138
Venture capital and partnership interests				48
Total domestic plan assets, at fair value				\$ 4,906

Plan assets measured at fair value on a recurring basis—foreign plans at Dec. 31, 2016

<i>(in millions)</i>	Level 1	Level 2	Level 3	Total fair value
Equity funds	\$ 371	\$ 207	\$ —	\$ 578
Sovereign/government obligation funds	—	95	—	95
Corporate debt funds	—	208	17	225
Cash and currency	120	—	—	120
Total foreign plan assets in the fair value hierarchy	\$ 491	\$ 510	\$ 17	\$ 1,018
Other assets measured at NAV				72
Total foreign plan assets, at fair value				\$ 1,090

Changes in Level 3 fair value measurements

The tables below present a rollforward of the plan assets for the years ended Dec. 31, 2017 and Dec. 31, 2016 (including the change in fair value), for financial instruments classified in Level 3 of the valuation hierarchy.

Fair value measurements using significant unobservable inputs—foreign plans—for the year ended Dec. 31, 2017	
<i>(in millions)</i>	Corporate debt funds
Fair value at Dec. 31, 2016	\$ 17
Transfers out of Level 3	(20)
Total gains or (losses) included in plan assets	3
Fair value at Dec. 31, 2017	\$ —
Change in unrealized gains or (losses) for the period included in earnings for assets held at the end of the reporting period	\$ —

Fair value measurements using significant unobservable inputs—foreign plans—for the year ended Dec. 31, 2016	
<i>(in millions)</i>	Corporate debt funds
Fair value at Dec. 31, 2015	\$ 19
Total gains or (losses) included in plan assets	(2)
Fair value at Dec. 31, 2016	\$ 17
Change in unrealized gains or (losses) for the period included in earnings for assets held at the end of the reporting period	\$ (2)

Funds of funds and venture capital and partnership interests valued using NAV per share

BNY Mellon had pension and post-retirement plan assets invested in funds of funds, venture capital and partnership interests, property funds and other contracts valued using NAV. The funds of funds investments are redeemable at NAV under agreements with the funds of funds managers.

Assets valued using NAV at Dec. 31, 2017				
<i>(dollar amounts in millions)</i>	Fair value	Unfunded commitments	Redemption frequency	Redemption notice period
Funds of funds (a)	\$ 152	\$ —	Monthly	30-45 days
Venture capital and partnership interests (b)	128	49	N/A	N/A
Property funds (c)	51	—	Monthly	0-90 days
Corporate debt	20	—	N/A	N/A
Other contracts (d)	13	—	N/A	N/A
Total	\$ 364	\$ 49		

Assets valued using NAV at Dec. 31, 2016				
<i>(dollar amounts in millions)</i>	Fair value	Unfunded commitments	Redemption frequency	Redemption notice period
Funds of funds (a)	\$ 158	\$ —	Monthly	30-45 days
Venture capital and partnership interests (b)	48	8	N/A	N/A
Property funds (c)	40	—	Daily-Quarterly	0-90 days
Other contracts (d)	12	—	N/A	N/A
Total	\$ 258	\$ 8		

- (a) Funds of funds include multi-strategy hedge funds that utilize investment strategies that invest over both long-term investment and short-term investment horizons.
- (b) Venture capital and partnership interests do not have redemption rights. Distributions from such funds will be received as the underlying investments are liquidated.
- (c) Property funds include funds invested in regional real estate vehicles that hold direct interest in real estate properties.
- (d) Other contracts include assets invested in pooled accounts at insurance companies that are privately valued by the asset manager.

Defined contribution plans

BNY Mellon 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 Bank of New York Mellon Corporation 401(k) Savings Plan sponsored by the Company in the U.S. and covers substantially all U.S. employees.

Under The Bank of New York Mellon Corporation 401(k) Savings Plan, the Company matched 100% of the first 4% of an employee's eligible base pay plus 50% of the next 2% of eligible pay contributed by the participant for a maximum matching contribution of 5% for 2017, 2016 and 2015, subject to statutory limits.

The U.S. qualified and nonqualified defined benefit plans were closed to new participants effective Dec. 31, 2010, at which time an annual non-elective contribution equal to 2% of eligible base pay was added to The Bank of New York Mellon Corporation 401(k) Savings Plan.

Effective June 30, 2015, the benefit accruals under the U.S. qualified and nonqualified defined benefit plans were frozen. Employees, who were hired before Jan. 1, 2010 and were eligible to earn benefits in the pension plan prior to freezing the benefit accrual, received the non-elective contribution starting July 1, 2015. All Company contributions are invested according to participants' individual elections.

At Dec. 31, 2017 and Dec. 31, 2016, The Bank of New York Mellon Corporation 401(k) Savings Plan owned 13.2 million and 14.2 million shares of our common stock, respectively. The fair value of total assets was \$6.6 billion at Dec. 31, 2017 and \$5.7 billion at Dec. 31, 2016. We recorded expense of \$232 million in 2017, \$224 million in 2016 and \$209 million in 2015 primarily for contributions to our defined contribution plans.

We also have an ESOP covering certain domestic full-time employees hired on or before July 1, 2008. The ESOP works in conjunction with the defined benefit pension plan. Employees are entitled to the higher of their benefit under the ESOP or such defined benefit pension plan at retirement. Benefits payable under the defined benefit pension plan are offset by the equivalent value of benefits earned under the ESOP.

At Dec. 31, 2017 and Dec. 31, 2016, the ESOP owned 5.4 million and 5.7 million shares of our common stock, respectively. The fair value of total ESOP assets was \$293 million at Dec. 31, 2017 and \$273 million at Dec. 31, 2016. The ESOP was amended effective June 30, 2015 to discontinue the ability of the Company to make contributions to the ESOP. There were no contributions in 2015, prior to amending the plan.

The Benefits Investment Committee appointed Fiduciary Counselors, Inc. to serve as the independent fiduciary to (i) make all fiduciary decisions related to the continued prudence of offering the common stock of BNY Mellon or its affiliates as an investment option under the plans, other than plan sponsor decisions, and (ii) select and monitor any actively or passively managed investments (including mutual funds) of BNY Mellon or its affiliates to be offered to participants as investment options under the plans, excluding self-directed accounts.

Note 17 - Company financial information (Parent Corporation)

In connection with our single point of entry resolution strategy, we have established an IHC to facilitate the provision of capital and liquidity resources to certain key subsidiaries in the event of material financial distress or failure. In the second quarter of 2017, we entered into a binding support agreement with those key subsidiaries and other related entities that

requires the IHC to provide that support. The support agreement required the Parent to transfer \$10.4 billion of intercompany loans and \$5.6 billion of cash to the IHC, and requires the Parent to continue to transfer cash and other liquid financial assets to the IHC, subject to certain amounts retained by the Parent to meet its near-term cash needs. The Parent's and the IHC's obligations under the support agreement are secured. In connection with the initial transfer, the IHC issued \$16.0 billion of unsecured subordinated funding notes to the Parent. The IHC has also provided the Parent with a committed line of credit that allows the Parent to draw funds necessary to service near-term obligations. As a result, during business-as-usual circumstances, the Parent is expected to continue to have access to the funds necessary to pay dividends, repurchase common stock, service its debt and satisfy its other obligations. If our projected liquidity resources deteriorate so severely that resolution of the Parent becomes imminent, the committed line of credit the IHC provided to the Parent will automatically terminate, with all amounts outstanding becoming due and payable, and the support agreement will require the Parent to transfer most of its remaining assets (other than stock in subsidiaries and a cash reserve to fund bankruptcy expenses) to the IHC. As a result, during a period of severe financial stress, the Parent could become unable to meet its debt and payment obligations (including with respect to its securities), causing the Parent to seek protection under bankruptcy laws earlier than it otherwise would have.

Our bank subsidiaries are subject to dividend limitations under the Federal Reserve Act, as well as national and state banking laws. Under these statutes, prior regulatory consent is required for dividends in any year that would exceed the bank's net profits for such year combined with retained net profits for the prior two years. Additionally, such bank subsidiaries may not declare dividends in excess of net profits on hand, as defined, after deducting the amount by which the principal amount of all loans, on which interest is past due for a period of six months or more, exceeds the allowance for credit losses.

The payment of dividends also is limited by minimum capital requirements imposed on banks. As of Dec. 31, 2017, BNY Mellon's bank subsidiaries exceeded these minimum requirements.

Subsequent to Dec. 31, 2017, our U.S. bank subsidiaries could declare dividends to the Parent of

approximately \$6.2 billion, without the need for a regulatory waiver. In addition, at Dec. 31, 2017, non-bank subsidiaries of the Parent had liquid assets of approximately \$1.4 billion.

The bank subsidiaries declared dividends of \$1.3 billion in 2017, \$160 million in 2016 and \$182 million in 2015. The Federal Reserve and the OCC have issued additional guidelines that require BHCs and national banks to continually evaluate the level of cash dividends in relation to their respective operating income, capital needs, asset quality and overall financial condition.

The Federal Reserve policy with respect to the payment of cash dividends by BHCs provides that, as a matter of prudent banking, a BHC should not maintain a rate of cash dividends unless its net income available to common shareholders has been sufficient to fully fund the dividends, and the prospective rate of earnings retention appears to be consistent with the holding company's capital needs, asset quality and overall financial condition. The Federal Reserve can also prohibit a dividend if payment would constitute an unsafe or unsound banking practice. Any increase in BNY Mellon's ongoing quarterly dividends would require approval from the Federal Reserve. The Federal Reserve's instructions for the 2018 CCAR provided that, for large BHCs like us, dividend payout ratios exceeding 30% of after-tax net income would receive particularly close scrutiny.

BNY Mellon and other affected BHCs may pay dividends, repurchase stock, and make other capital distributions only in accordance with a capital plan that has been reviewed by the Federal Reserve and as to which the Federal Reserve has not objected. The Federal Reserve may object to a capital plan if the plan does not show that the covered BHC will meet, for each quarter throughout the nine-quarter planning horizon covered by the capital plan, all minimum regulatory capital ratios under applicable capital rules as in effect for that quarter on a *pro forma* basis under the base case and stressed scenarios (including a severely adverse scenario provided by the Federal Reserve). The capital plan rules also stipulate that a covered BHC may not make a capital distribution unless after giving effect to the distribution it will meet all minimum regulatory capital ratios. As part of this process, BNY Mellon also provides the Federal Reserve with estimates of the composition and levels of regulatory capital, RWAs and other

measures under Basel III under an identified scenario. In June 2017, BNY Mellon received confirmation that the Federal Reserve did not object to its 2017 capital plan. The board of directors subsequently approved the repurchase of up to \$2.6 billion worth of common stock over a four-quarter period beginning in the third quarter of 2017 and continuing through the second quarter of 2018. This new share repurchase plan replaces all previously authorized share repurchase plans.

The Federal Reserve Act limits, and requires collateral for, extensions of credit by our insured subsidiary banks to BNY Mellon and certain of its non-bank affiliates. Also, there are restrictions on the amounts of investments by such banks in stock and other securities of BNY Mellon and such affiliates, and restrictions on the acceptance of their securities as collateral for loans by such banks. Extensions of credit by the banks to each of our affiliates are limited to 10% of such bank's regulatory capital, and in the aggregate for BNY Mellon and all such affiliates to 20%, and collateral must be between 100% and 130% of the amount of the credit, depending on the type of collateral.

Our insured subsidiary banks are required to maintain reserve balances with Federal Reserve Banks under the Federal Reserve Act and Regulation D. Required balances averaged \$5.6 billion and \$6.0 billion for the years 2017 and 2016, respectively.

In the event of impairment of the capital stock of one of the Parent's national banks or The Bank of New York Mellon, the Parent, as the banks' stockholder, could be required to pay such deficiency.

The Parent guarantees the debt issued by Mellon Funding Corporation, a wholly owned financing subsidiary of the Company. The Parent also guarantees committed and uncommitted lines of credit of Pershing LLC and Pershing Limited subsidiaries. The Parent guarantees described above are full and unconditional and contain the standard provisions relating to parent guarantees of subsidiary debt. Additionally, the Parent guarantees or indemnifies obligations of its consolidated subsidiaries as needed. Generally, there are no stated notional amounts included in these indemnifications and the contingencies triggering the obligation for indemnification are not expected to occur. As a result, we are unable to develop an estimate of the maximum payout under these indemnifications.

However, we believe the possibility is remote that we will have to make any material payment under these guarantees and indemnifications.

The condensed financial statements of the Parent include the accounts of the Parent; Mellon Funding Corporation and MIPA, LLC, a single-member limited liability company, created to hold and administer corporate-owned life insurance. Financial data for the Parent, the financing subsidiary and the single-member limited liability company are combined for financial reporting purposes because of the limited function of these entities and the unconditional guarantee by BNY Mellon of their obligations.

The Parent's condensed financial statements are as follows:

Condensed Income Statement—The Bank of New York Mellon Corporation (Parent Corporation)

<i>(in millions)</i>	Year ended Dec. 31,		
	2017	2016	2015
Dividends from bank subsidiaries	\$ 1,405	\$ 125	\$ 145
Dividends from nonbank subsidiaries	382	798	207
Interest revenue from bank subsidiaries	25	70	68
Interest revenue from nonbank subsidiaries	171	121	91
Gain on securities held for sale	—	—	3
Other revenue	67	39	25
Total revenue	2,050	1,153	539
Interest (including, \$73, \$88, \$69, to subsidiaries, respectively)	663	427	288
Other expense	254	262	64
Total expense	917	689	352
Income before income taxes and equity in undistributed net income of subsidiaries	1,133	464	187
(Benefit) for income taxes	(526)	(333)	(98)
Equity in undistributed net income:			
Bank subsidiaries	1,524	2,474	2,004
Nonbank subsidiaries	907	276	869
Net income	4,090	3,547	3,158
Preferred stock dividends	(175)	(122)	(105)
Net income applicable to common shareholders of The Bank of New York Mellon Corporation	\$ 3,915	\$ 3,425	\$ 3,053

Condensed Balance Sheet—The Bank of New York Mellon Corporation (Parent Corporation)

<i>(in millions)</i>	Dec. 31,	
	2017	2016
Assets:		
Cash and due from banks	\$ 1,301	\$ 9,117
Securities	40	1,693
Loans, net of allowance	—	7
Investment in and advances to subsidiaries and associated companies:		
Banks	32,967	32,771
Other	37,660	26,630
Subtotal	70,627	59,401
Corporate-owned life insurance	756	744
Other assets	1,135	885
Total assets	\$ 73,859	\$ 71,847
Liabilities:		
Deferred compensation	\$ 476	\$ 464
Affiliate borrowings	3,177	7,107
Other liabilities	1,373	1,445
Long-term debt	27,582	24,020
Total liabilities	32,608	33,036
Shareholders' equity	41,251	38,811
Total liabilities and shareholders' equity	\$ 73,859	\$ 71,847

Condensed Statement of Cash Flows—The Bank of New York Mellon Corporation (Parent Corporation)

(in millions)	Year ended Dec. 31,		
	2017	2016	2015
Operating activities:			
Net income	\$ 4,090	\$ 3,547	\$ 3,158
Adjustments to reconcile net income to net cash provided by (used in) operating activities:			
Equity in undistributed net (income) of subsidiaries	(2,431)	(2,750)	(2,873)
Change in accrued interest receivable	(6)	2	(4)
Change in accrued interest payable	42	4	15
Change in taxes payable (a)	(600)	452	132
Other, net	38	(31)	66
Net cash provided by operating activities	1,133	1,224	494
Investing activities:			
Purchases of securities	(991)	(1,739)	—
Proceeds from sales of securities	2,729	—	3
Change in loans	7	13	56
Acquisitions of, investments in, and advances to subsidiaries (b)	(7,208)	(317)	(358)
Other, net	—	—	14
Net cash (used for) investing activities	(5,463)	(2,043)	(285)
Financing activities:			
Proceeds from issuance of long-term debt	4,738	6,229	4,986
Repayments of long-term debt	(997)	(2,700)	(3,650)
Change in advances from subsidiaries	(3,930)	(1,136)	2,123
Issuance of common stock	465	465	352
Treasury stock acquired	(2,686)	(2,398)	(2,355)
Issuance of preferred stock	—	990	990
Cash dividends paid	(1,076)	(900)	(865)
Tax benefit realized on share-based payment awards	—	3	76
Net cash (used for) provided by financing activities	(3,486)	553	1,657
Change in cash and due from banks	(7,816)	(266)	1,866
Cash and due from banks at beginning of year	9,117	9,383	7,517
Cash and due from banks at end of year	\$ 1,301	\$ 9,117	\$ 9,383
Supplemental disclosures			
Interest paid	\$ 705	\$ 409	\$ 302
Income taxes paid	61	1	158
Income taxes refunded	15	12	103

(a) Includes payments received from subsidiaries for taxes of \$189 million in 2017, \$189 million in 2016 and \$24 million in 2015.

(b) Includes \$10,296 million of cash outflows, net of \$3,088 million of cash inflows in 2017.

Note 18 - Fair value measurement

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. A three-level hierarchy for fair value measurements is utilized based upon the transparency of inputs to the valuation of an asset or liability as of the measurement date. BNY Mellon's

own creditworthiness is considered when valuing liabilities.

Fair value focuses on exit price in an orderly transaction (that is, not a forced liquidation or distressed sale) between market participants at the measurement date under current market conditions. If there has been a significant decrease in the volume and level of activity for the asset or liability, a change in valuation technique or the use of multiple valuation techniques may be appropriate. In such instances, determining the price at which willing market participants would transact at the measurement date under current market conditions depends on the facts and circumstances and requires the use of significant judgment. The objective is to determine from weighted indicators of fair value a reasonable point within the range that is most representative of fair value under current market conditions.

Determination of fair value

We have established processes for determining fair values. Fair value is based upon quoted market prices in active markets, where available. For financial instruments where quotes from recent exchange transactions are not available, we determine fair value based on discounted cash flow analysis, comparison to similar instruments and the use of financial models. Discounted cash flow analysis is dependent upon estimated future cash flows and the level of interest rates. Model-based pricing uses inputs of observable prices, where available, for interest rates, foreign exchange rates, option volatilities and other factors. Models are benchmarked and validated by an independent internal risk management function. Our valuation process takes into consideration factors such as counterparty credit quality, liquidity, concentration concerns and observability of model parameters. Valuation adjustments may be made to record financial instruments at fair value.

Most derivative contracts are valued using internally developed models which are calibrated to observable market data and employ standard market pricing theory for their valuations. An initial "risk-neutral" valuation is performed on each position assuming time-discounting based on an AA credit curve. Then, to arrive at a fair value that incorporates counterparty credit risk, a credit adjustment is made to these results by discounting each trade's expected exposures to the counterparty using the counterparty's credit spreads, as implied by the credit default swap market. We also

adjust expected liabilities to the counterparty using BNY Mellon's own credit spreads, as implied by the credit default swap market. Accordingly, the valuation of our derivative positions is sensitive to the current changes in our own credit spreads as well as those of our counterparties.

In certain cases, recent prices may not be observable for instruments that trade in inactive or less active markets. Upon evaluating the uncertainty in valuing financial instruments subject to liquidity issues, we make an adjustment to their value. The determination of the liquidity adjustment includes the availability of external quotes, the time since the latest available quote and the price volatility of the instrument.

Certain parameters in some financial models are not directly observable and, therefore, are based on management's estimates and judgments. These financial instruments are normally traded less actively. We apply valuation adjustments to mitigate the possibility of error and revision in the model based estimate value. Examples include products where parameters such as correlation and recovery rates are unobservable.

The methods described above for instruments that trade in inactive or less active markets may produce a current fair value calculation that may not be indicative of net realizable value or reflective of future fair values. We believe our methods of determining fair value are appropriate and consistent with other market participants. However, the use of different methodologies or different assumptions to value certain financial instruments could result in a different estimate of fair value.

Valuation hierarchy

A three-level valuation hierarchy is used for disclosure of fair value measurements based upon the transparency of inputs to the valuation of an asset or liability as of the measurement date. The three levels are described below.

Level 1: Inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets. Level 1 assets and liabilities include certain debt and equity securities, derivative financial instruments actively traded on exchanges and highly liquid government bonds.

Level 2: Observable inputs other than Level 1 prices, for example, quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, and inputs that are observable or can be corroborated, either directly or indirectly, for substantially the full term of the financial instrument. Level 2 assets and liabilities include debt instruments that are traded less frequently than exchange-traded securities and derivative financial instruments whose model inputs are observable in the market or can be corroborated by market-observable data. Examples in this category are mortgage-backed securities, corporate debt securities and OTC derivative contracts.

Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement.

Valuation methodology

Following is a description of the valuation methodologies used for instruments measured at fair value, as well as the general classification of such instruments pursuant to the valuation hierarchy.

Securities

Where quoted prices are available in an active market, we classify the securities within Level 1 of the valuation hierarchy. Securities include both long and short positions. Level 1 securities include U.S. Treasury and certain sovereign debt securities that are actively traded in highly liquid OTC markets, money market funds and exchange-traded equities.

If quoted market prices are not available, we estimate fair values using pricing models, quoted prices of securities with similar characteristics or discounted cash flows. Examples of such instruments, which would generally be classified within Level 2 of the valuation hierarchy, include mortgage-backed securities, state and political subdivisions, certain sovereign debt, corporate bonds and foreign covered bonds.

For securities where quotes from recent transactions are not available for identical securities, we determine

fair value primarily based on pricing sources with reasonable levels of price transparency that employ financial models or obtain comparison to similar instruments to arrive at “consensus” prices.

Specifically, the pricing sources obtain recent transactions for similar types of securities (e.g., vintage, position in the securitization structure) and ascertain variables such as discount rate and speed of prepayment for the types of transaction and apply such variables to similar types of bonds. We view these as observable transactions in the current marketplace and classify such securities as Level 2. Pricing sources discontinue pricing any specific security whenever they determine there is insufficient observable data to provide a good faith opinion on price.

In addition, we have significant investments in more actively traded agency RMBS and other types of securities such as sovereign debt. The pricing sources derive the prices for these securities largely from quotes they obtain from three major inter-dealer brokers.

In certain cases where there is limited activity or less transparency around inputs to the valuation, we classify those securities in Level 3 of the valuation hierarchy. Securities classified within Level 3 may include securities of state and political subdivisions and distressed debt securities.

At Dec. 31, 2017, approximately 99% of our securities were valued by pricing sources with reasonable levels of price transparency. We have no instruments included in Level 3 of the valuation hierarchy.

Derivative financial instruments

We classify exchange-traded derivative financial instruments valued using quoted prices in Level 1 of the valuation hierarchy. Examples include exchange-traded equity and foreign exchange options. Since few other classes of derivative contracts are listed on an exchange, most of our derivative positions are valued using internally developed models that use as their basis readily observable market parameters, and we classify them in Level 2 of the valuation hierarchy. Such derivative financial instruments include swaps and options, foreign exchange spot and forward contracts and credit default swaps.

Derivatives valued using models with significant unobservable market parameters in markets that lack two-way flow are classified in Level 3 of the valuation hierarchy. Examples may include long-dated swaps and options, where parameters may be unobservable for longer maturities; and certain highly structured products, where correlation risk is unobservable. As of Dec. 31, 2017 we have no Level 3 derivatives. Additional disclosures of derivative instruments are provided in Note 21 of the Notes to Consolidated Financial Statements.

Seed capital

In our Investment Management business, we manage investment assets, including equities, fixed income, money market and multi-asset and alternative investment funds for institutions and other investors. As part of that activity, we make seed capital investments in certain funds. Seed capital is generally included in other assets on the consolidated balance sheet. When applicable, we value seed capital based on the published NAV of the fund.

For other types of investments in funds, we consider all of the rights and obligations inherent in our ownership interest, including the reported NAV as well as other factors that affect the fair value of our interest in the fund.

Interests in securitizations

For the interests in securitizations that are classified in securities available-for-sale, trading assets and long-term debt, we use discounted cash flow models, which generally include assumptions of projected finance charges related to the securitized assets, estimated net credit losses, prepayment assumptions and estimates of payments to third-party investors. When available, we compare our fair value estimates and assumptions to market activity and to the actual results of the securitized portfolio.

Other assets measured at NAV

BNY Mellon holds private equity investments, specifically SBICs, which are compliant with the Volcker Rule. There are no readily available market quotations for these investment partnerships. The fair value of the SBICs is based on our ownership percentage of the fair value of the underlying investments as provided by the partnership managers. These investments are typically valued on a quarterly

basis. Our SBIC private equity investments are valued at NAV as a practical expedient for fair value.

The following tables present the financial instruments carried at fair value at Dec. 31, 2017 and Dec. 31, 2016, by caption on the consolidated balance sheet and by the three-level valuation hierarchy. We have included credit ratings information in certain of the tables because the information indicates the degree of credit risk to which we are exposed, and significant

changes in ratings classifications could result in increased risk for us. Beginning in 2017, we refined the methodology used to determine the level of the three-level valuation hierarchy for certain available-for-sale securities which resulted in most sovereign debt being transferred from Level 2 to Level 1 and most foreign covered bonds being transferred from Level 1 to Level 2. Prior period amounts were not adjusted.

Assets measured at fair value on a recurring basis at Dec. 31, 2017 <i>(dollar amounts in millions)</i>	Level 1	Level 2	Level 3	Netting (a)	Total carrying value
Available-for-sale securities:					
U.S. Treasury	\$ 15,263	\$ —	\$ —	\$ —	\$ 15,263
U.S. government agencies	—	908	—	—	908
Sovereign debt/sovereign guaranteed	9,919	2,638	—	—	12,557
State and political subdivisions	—	2,957	—	—	2,957
Agency RMBS	—	23,819	—	—	23,819
Non-agency RMBS	—	487	—	—	487
Other RMBS	—	149	—	—	149
Commercial MBS	—	1,360	—	—	1,360
Agency commercial MBS	—	8,762	—	—	8,762
CLOs	—	2,909	—	—	2,909
Other asset-backed securities	—	1,043	—	—	1,043
Money market funds (b)	963	—	—	—	963
Corporate bonds	—	1,255	—	—	1,255
Other debt securities	—	3,491	—	—	3,491
Foreign covered bonds	—	2,529	—	—	2,529
Non-agency RMBS (c)	—	1,091	—	—	1,091
Total available-for-sale securities	26,145	53,398	—	—	79,543
Trading assets:					
Debt and equity instruments (b)	1,344	1,910	—	—	3,254
Derivative assets not designated as hedging:					
Interest rate	9	6,430	—	(5,075)	1,364
Foreign exchange	—	5,104	—	(3,720)	1,384
Equity and other contracts	—	70	—	(50)	20
Total derivative assets not designated as hedging	9	11,604	—	(8,845)	2,768
Total trading assets	1,353	13,514	—	(8,845)	6,022
Other assets:					
Derivative assets designated as hedging:					
Interest rate	—	278	—	—	278
Foreign exchange	—	45	—	—	45
Total derivative assets designated as hedging	—	323	—	—	323
Other assets (d)	144	170	—	—	314
Other assets measured at NAV (d)	—	—	—	—	154
Total other assets	144	493	—	—	791
Subtotal assets of operations at fair value	27,642	67,405	—	(8,845)	86,356
Percentage of assets of operations prior to netting	29%	71%	—%		
Assets of consolidated investment management funds	322	409	—	—	731
Total assets	\$ 27,964	\$ 67,814	\$ —	\$ (8,845)	\$ 87,087
Percentage of total assets prior to netting	29%	71%	—%		

Liabilities measured at fair value on a recurring basis at Dec. 31, 2017 <i>(dollar amounts in millions)</i>	Level 1	Level 2	Level 3	Netting (a)	Total carrying value
Trading liabilities:					
Debt and equity instruments	\$ 1,128	\$ 80	\$ —	\$ —	\$ 1,208
Derivative liabilities not designated as hedging:					
Interest rate	4	6,349	—	(5,495)	858
Foreign exchange	—	5,067	—	(3,221)	1,846
Equity and other contracts	—	153	—	(81)	72
Total derivative liabilities not designated as hedging	4	11,569	—	(8,797)	2,776
Total trading liabilities	1,132	11,649	—	(8,797)	3,984
Long-term debt (b)	—	367	—	—	367
Other liabilities – derivative liabilities designated as hedging:					
Interest rate	—	534	—	—	534
Foreign exchange	—	266	—	—	266
Total other liabilities – derivative liabilities designated as hedging	—	800	—	—	800
Subtotal liabilities of operations at fair value	1,132	12,816	—	(8,797)	5,151
Percentage of liabilities of operations prior to netting	8%	92%	—%		
Liabilities of consolidated investment management funds	1	1	—	—	2
Total liabilities	\$ 1,133	\$ 12,817	\$ —	\$ (8,797)	\$ 5,153
Percentage of total liabilities prior to netting	8%	92%	—%		

(a) ASC 815, *Derivatives and Hedging*, permits the netting of derivative receivables and derivative payables under legally enforceable master netting agreements and permits the netting of cash collateral. Netting is applicable to derivatives not designated as hedging instruments included in trading assets or trading liabilities and derivatives designated as hedging instruments included in other assets or other liabilities. Netting is allocated to the derivative products based on the net fair value of each product.

(b) Includes certain interests in securitizations.

(c) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.

(d) Includes private equity investments and seed capital.

Notes to Consolidated Financial Statements (continued)

Assets measured at fair value on a recurring basis at Dec. 31, 2016 <i>(dollar amounts in millions)</i>	Level 1	Level 2	Level 3	Netting (a)	Total carrying value
Available-for-sale securities:					
U.S. Treasury	\$ 14,307	\$ —	\$ —	\$ —	\$ 14,307
U.S. government agencies	—	359	—	—	359
Sovereign debt/sovereign guaranteed	66	12,423	—	—	12,489
State and political subdivisions	—	3,378	—	—	3,378
Agency RMBS	—	22,736	—	—	22,736
Non-agency RMBS	—	638	—	—	638
Other RMBS	—	513	—	—	513
Commercial MBS	—	928	—	—	928
Agency commercial MBS	—	6,449	—	—	6,449
CLOs	—	2,598	—	—	2,598
Other asset-backed securities	—	1,727	—	—	1,727
Equity securities	3	—	—	—	3
Money market funds (b)	842	—	—	—	842
Corporate bonds	—	1,396	—	—	1,396
Other debt securities	—	1,961	—	—	1,961
Foreign covered bonds	1,876	265	—	—	2,141
Non-agency RMBS (c)	—	1,357	—	—	1,357
Total available-for-sale securities	17,094	56,728	—	—	73,822
Trading assets:					
Debt and equity instruments (b)	240	2,013	—	—	2,253
Derivative assets not designated as hedging:					
Interest rate	4	7,583	—	(6,047)	1,540
Foreign exchange	—	6,104	—	(4,172)	1,932
Equity and other contracts	—	46	—	(38)	8
Total derivative assets not designated as hedging	4	13,733	—	(10,257)	3,480
Total trading assets	244	15,746	—	(10,257)	5,733
Other assets:					
Derivative assets designated as hedging:					
Interest rate	—	415	—	—	415
Foreign exchange	—	369	—	—	369
Total derivative assets designated as hedging	—	784	—	—	784
Other assets (d)	268	73	—	—	341
Other assets measured at NAV (d)	268	857	—	—	1,339
Subtotal assets of operations at fair value	17,606	73,331	—	(10,257)	80,894
Percentage of assets of operations prior to netting	19%	81%	—%		
Assets of consolidated investment management funds	464	767	—	—	1,231
Total assets	\$ 18,070	\$ 74,098	\$ —	\$ (10,257)	\$ 82,125
Percentage of total assets prior to netting	20%	80%	—%		

Liabilities measured at fair value on a recurring basis at Dec. 31, 2016 <i>(dollar amounts in millions)</i>	Level 1	Level 2	Level 3	Netting (a)	Total carrying value
Trading liabilities:					
Debt and equity instruments	\$ 349	\$ 236	\$ —	\$ —	\$ 585
Derivative liabilities not designated as hedging:					
Interest rate	4	7,629	—	(6,634)	999
Foreign exchange	—	6,103	—	(3,363)	2,740
Equity and other contracts	—	115	—	(50)	65
Total derivative liabilities not designated as hedging	4	13,847	—	(10,047)	3,804
Total trading liabilities	353	14,083	—	(10,047)	4,389
Long-term debt (b)	—	363	—	—	363
Other liabilities – derivative liabilities designated as hedging:					
Interest rate	—	545	—	—	545
Foreign exchange	—	52	—	—	52
Total other liabilities – derivative liabilities designated as hedging	—	597	—	—	597
Subtotal liabilities of operations at fair value	353	15,043	—	(10,047)	5,349
Percentage of liabilities of operations prior to netting	2%	98%	—%		
Liabilities of consolidated investment management funds	3	312	—	—	315
Total liabilities	\$ 356	\$ 15,355	\$ —	\$ (10,047)	\$ 5,664
Percentage of total liabilities prior to netting	2%	98%	—%		

(a) ASC 815, *Derivatives and Hedging*, permits the netting of derivative receivables and derivative payables under legally enforceable master netting agreements and permits the netting of cash collateral. Netting is applicable to derivatives not designated as hedging instruments included in trading assets or trading liabilities and derivatives designated as hedging instruments included in other assets or other liabilities. Netting is allocated to the derivative products based on the net fair value of each product.

(b) Includes certain interests in securitizations.

(c) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.

(d) Includes private equity investments and seed capital.

Notes to Consolidated Financial Statements (continued)

Details of certain items measured at fair value on a recurring basis	Dec. 31, 2017					Dec. 31, 2016				
	Total carrying value (b)	AAA/ AA-	A+/ A-	BBB+/ BBB-	BB+ and lower	Total carrying value (b)	AAA/ AA-	A+/ A-	BBB+/ BBB-	BB+ and lower
<i>(dollar amounts in millions)</i>										
Non-agency RMBS, originated in:										
2007	\$ 40	—%	—%	—%	100%	\$ 58	—%	—%	—%	100%
2006	81	—	—	—	100	98	—	—	—	100
2005	142	19	3	17	61	180	23	5	9	63
2004 and earlier	224	4	3	34	59	302	5	3	24	68
Total non-agency RMBS	\$ 487	7%	2%	21%	70%	\$ 638	9%	3%	14%	74%
Commercial MBS - Domestic, originated in:										
2009-2017	\$ 1,309	94%	6%	—%	—%	\$ 674	84%	16%	—%	—%
2008	—	—	—	—	—	14	100	—	—	—
2007	—	—	—	—	—	190	71	29	—	—
2006	—	—	—	—	—	3	7	93	—	—
Total commercial MBS - Domestic	\$ 1,309	94%	6%	—%	—%	\$ 881	81%	19%	—%	—%
Foreign covered bonds:										
Canada	\$ 1,659	100%	—%	—%	—%	\$ 1,320	100%	—%	—%	—%
Australia	265	100	—	—	—	40	100	—	—	—
Netherlands	178	100	—	—	—	160	100	—	—	—
United Kingdom	103	100	—	—	—	280	100	—	—	—
Other	324	100	—	—	—	341	100	—	—	—
Total foreign covered bonds	\$ 2,529	100%	—%	—%	—%	\$ 2,141	100%	—%	—%	—%
European floating rate notes - available-for-sale:										
United Kingdom	\$ 130	81%	19%	—%	—%	\$ 379	90%	10%	—%	—%
Netherlands	71	—	100	—	—	125	100	—	—	—
Ireland	—	—	—	—	—	58	—	—	100	—
Total European floating rate notes - available-for-sale	\$ 201	53%	47%	—%	—%	\$ 562	83%	7%	10%	—%
Sovereign debt/sovereign guaranteed:										
United Kingdom	\$ 3,052	100%	—%	—%	—%	\$ 3,209	100%	—%	—%	—%
France	2,046	100	—	—	—	1,998	100	—	—	—
Spain	1,635	—	—	100	—	1,749	—	—	100	—
Germany	1,586	100	—	—	—	1,347	100	—	—	—
Italy	1,292	—	—	100	—	1,130	—	—	100	—
Netherlands	1,027	100	—	—	—	1,061	100	—	—	—
Ireland	843	—	100	—	—	736	—	100	—	—
Belgium	803	100	—	—	—	1,005	100	—	—	—
Other (c)	273	50	—	—	50	254	71	—	—	29
Total sovereign debt/sovereign guaranteed	\$ 12,557	69%	7%	23%	1%	\$ 12,489	70%	6%	23%	1%
Non-agency RMBS (d), originated in:										
2007	\$ 311	—%	—%	—%	100%	\$ 387	—%	—%	—%	100%
2006	306	—	—	—	100	391	—	—	—	100
2005	365	1	1	1	97	437	—	2	1	97
2004 and earlier	109	2	2	23	73	142	2	2	17	79
Total non-agency RMBS (d)	\$ 1,091	—%	1%	3%	96%	\$ 1,357	—%	1%	2%	97%

(a) Represents ratings by S&P or the equivalent.

(b) At Dec. 31, 2017 and Dec. 31, 2016, foreign covered bonds and sovereign debt/sovereign guaranteed securities were included in Level 1 and Level 2 in the valuation hierarchy. All other assets in the table are Level 2 assets in the valuation hierarchy.

(c) Includes non-investment grade sovereign debt/sovereign guaranteed securities related to Brazil of \$136 million at Dec. 31, 2017 and \$73 million at Dec. 31, 2016.

(d) Previously included in the Grantor Trust. The Grantor Trust was dissolved in 2011.

Changes in Level 3 fair value measurements

Our classification of a financial instrument in Level 3 of the valuation hierarchy is based on the significance of the unobservable factors to the overall fair value measurement. However, these instruments generally include other observable components that are actively quoted or validated to third-party sources; accordingly, the gains and losses in the table below include changes in fair value due to observable parameters as well as the unobservable parameters in our valuation methodologies. We also manage the

risks of Level 3 financial instruments using securities and derivatives that are Level 1 or Level 2 instruments which are not included in the table; accordingly, the gains or losses below do not reflect the effect of our risk management activities related to the Level 3 instruments.

The Company has a Level 3 Pricing Committee which evaluates the valuation techniques used in determining the fair value of Level 3 assets and liabilities.

There were no financial instruments recorded at fair value on a recurring basis classified in Level 3 of the valuation hierarchy in 2017.

The table below includes a roll forward of the balance sheet amount for the year ended Dec. 31, 2016 (including the change in fair value), for financial instruments classified in Level 3 of the valuation hierarchy.

Fair value measurements for assets using significant unobservable inputs	
<i>(in millions)</i>	Loans
Fair value at Dec. 31, 2015	\$ —
Transfers into Level 3	19
Total gains for the period included in earnings (a)	2
Purchases, issuances and sales:	
Purchases	113
Issuances	1
Sales	(135)
Fair value at Dec. 31, 2016	\$ —
Change in unrealized gains for the period included in earnings for assets held at the end of the reporting period	\$ —

(a) Reported in investment and other income.

Assets and liabilities measured at fair value on a nonrecurring basis

Under certain circumstances, we make adjustments to fair value our assets, liabilities and unfunded lending-related commitments although they are not measured at fair value on an ongoing basis. An example would be the recording of an impairment of an asset.

The following tables present the financial instruments carried on the consolidated balance sheet by caption and by level in the fair value hierarchy as of Dec. 31, 2017 and Dec. 31, 2016, for which a nonrecurring change in fair value has been recorded during the years ended Dec. 31, 2017 and Dec. 31, 2016.

Assets measured at fair value on a nonrecurring basis at Dec. 31, 2017				
<i>(in millions)</i>	Level 1	Level 2	Level 3	Total carrying value
Loans (a)	\$ —	\$ 73	\$ 6	\$ 79
Other assets (b)	—	4	—	4
Total assets at fair value on a nonrecurring basis	\$ —	\$ 77	\$ 6	\$ 83

Assets measured at fair value on a nonrecurring basis at Dec. 31, 2016				
<i>(in millions)</i>	Level 1	Level 2	Level 3	Total carrying value
Loans (a)	\$ —	\$ 84	\$ 7	\$ 91
Other assets (b)	—	4	—	4
Total assets at fair value on a nonrecurring basis	\$ —	\$ 88	\$ 7	\$ 95

(a) During the years ended Dec. 31, 2017 and Dec. 31, 2016, the fair value of these loans decreased \$1 million and \$2 million, respectively, based on the fair value of the underlying collateral based on guidance in ASC 310, Receivables, with an offset to the allowance for credit losses.

(b) Includes other assets received in satisfaction of debt.

Estimated fair value of financial instruments

The carrying amounts of our financial instruments (i.e., monetary assets and liabilities) are determined under different accounting methods - see Note 1 of the Notes to Consolidated Financial Statements. The following disclosure discusses these instruments on a uniform fair value basis. However, active markets do not exist for a significant portion of these instruments. For financial instruments where quoted prices from identical assets and liabilities in active markets do not exist, we determine fair value based on discounted cash flow analysis and comparison to similar instruments. Discounted cash flow analysis is dependent upon estimated future cash flows and the level of interest rates. Other judgments would result in different fair values. The fair value information supplements the basic financial statements and other traditional financial data presented throughout this report.

A summary of the practices used for determining fair value and the respective level in the valuation hierarchy for financial assets and liabilities not recorded at fair value follows.

Interest-bearing deposits with the Federal Reserve and other central banks and interest-bearing deposits with banks

The estimated fair value of interest-bearing deposits with the Federal Reserve and other central banks is equal to the book value as these interest-bearing deposits are generally considered cash equivalents. These instruments are classified as Level 2 within the valuation hierarchy. The estimated fair value of interest-bearing deposits with banks is generally determined using discounted cash flows and duration

of the instrument to maturity. The primary inputs used to value these transactions are interest rates based on current LIBOR market rates and time to maturity. Interest-bearing deposits with banks are classified as Level 2 within the valuation hierarchy.

Federal funds sold and securities purchased under resale agreements

The estimated fair value of federal funds sold and securities purchased under resale agreements is based on inputs such as interest rates and tenors. Federal funds sold and securities purchased under resale agreements are classified as Level 2 within the valuation hierarchy.

Securities held-to-maturity

Where quoted prices are available in an active market for identical assets and liabilities, we classify the securities as Level 1 within the valuation hierarchy. Level 1 securities include U.S. Treasury securities and certain sovereign debt securities.

If quoted market prices are not available for identical assets, we estimate fair value using pricing models, quoted prices of securities with similar characteristics or discounted cash flows. Examples of such instruments, which would generally be classified as Level 2 within the valuation hierarchy, include certain mortgage-backed securities and state and political subdivision securities. For securities where quotes from active markets are not available for identical securities, we determine fair value primarily based on pricing sources with reasonable levels of price transparency that employ financial models or obtain comparison to similar instruments to arrive at “consensus” prices.

Specifically, the pricing sources obtain active market prices for similar types of securities (e.g., vintage, position in the securitization structure) and ascertain variables such as discount rate and speed of prepayment for the types of transaction and apply such variables to similar types of bonds. We view these as observable transactions in the current marketplace and classify such securities as Level 2 within the valuation hierarchy.

Loans

For residential mortgage loans, fair value is estimated using discounted cash flow analysis, adjusting where

appropriate for prepayment estimates, using interest rates currently being offered for loans with similar terms and maturities to borrowers. The estimated fair value of margin loans and overdrafts is equal to the book value due to the short-term nature of these assets. The estimated fair value of other types of loans, including our term loan program, is determined using discounted cash flows. Inputs include current LIBOR market rates adjusted for credit spreads. These loans are generally classified as Level 2 within the valuation hierarchy.

Other financial assets

Other financial assets include cash, the Federal Reserve Bank stock and accrued interest receivable. Cash is classified as Level 1 within the valuation hierarchy. The Federal Reserve Bank stock is not redeemable or transferable. The estimated fair value of the Federal Reserve Bank stock is based on the issue price and is classified as Level 2 within the valuation hierarchy. Accrued interest receivable is generally short-term. As a result, book value is considered to equal fair value. Accrued interest receivable is included as Level 2 within the valuation hierarchy.

Noninterest-bearing and interest-bearing deposits

Interest-bearing deposits consist of money market rate and demand deposits, savings deposits and time deposits. Except for time deposits, book value is considered to equal fair value for these deposits due to their short duration to maturity or payable on demand feature. The estimated fair value of interest-bearing time deposits is determined using discounted cash flow analysis. The primary inputs used to value these transactions are interest rates based on current LIBOR market rates and time to maturity. For all noninterest-bearing deposits, book value is considered to equal fair value as a result of the short duration of the deposit. Interest-bearing and noninterest-bearing deposits are classified as Level 2 within the valuation hierarchy.

Federal funds purchased and securities sold under repurchase agreements

The estimated fair value of federal funds purchased and securities sold under repurchase agreements is based on inputs such as interest rates and tenors. Federal funds purchased and securities sold under

repurchase agreements are classified as Level 2 within the valuation hierarchy.

Payables to customers and broker-dealers

The estimated fair value of payables to customers and broker-dealers is equal to the book value, due to the demand feature of the payables to customers and broker-dealers, and is classified as Level 2 within the valuation hierarchy.

Commercial paper

The estimated fair value of our commercial paper is based on discount and duration of the commercial paper. Our commercial paper matures within 397 days from date of issue and is not redeemable prior to maturity or subject to voluntary prepayment. Our commercial paper is included in Level 2 of the valuation hierarchy.

Borrowings

Borrowings primarily consist of borrowings from the FHLB, overdrafts of sub-custodian account balances in our Investment Services businesses and accrued interest payable. The estimated fair value of borrowings from the FHLB is considered equal to

book value, due to the short duration to maturity and is classified as Level 2 within the valuation hierarchy. The estimated fair value of overdrafts of subcustodian account balances in our Investment Services businesses is considered to equal book value as a result of the short duration of the overdrafts and is included as Level 2 within the valuation hierarchy. Overdrafts are typically repaid within two days. Accrued interest payable is generally short-term. As a result, book value is considered to equal fair value. Accrued interest payable is included as Level 2 within the valuation hierarchy.

Long-term debt

The estimated fair value of long-term debt is based on current rates for instruments of the same remaining maturity or quoted market prices for the same or similar issues. Long-term debt is classified as Level 2 within the valuation hierarchy.

The following tables present the estimated fair value and the carrying amount of financial instruments not carried at fair value on the consolidated balance sheet at Dec. 31, 2017 and Dec. 31, 2016, by caption on the consolidated balance sheet and by the valuation hierarchy.

Summary of financial instruments	Dec. 31, 2017				
	Level 1	Level 2	Level 3	Total estimated fair value	Carrying amount
<i>(in millions)</i>					
Assets:					
Interest-bearing deposits with the Federal Reserve and other central banks	\$ —	\$ 91,510	\$ —	\$ 91,510	\$ 91,510
Interest-bearing deposits with banks	—	11,982	—	11,982	11,979
Federal funds sold and securities purchased under resale agreements	—	28,135	—	28,135	28,135
Securities held-to-maturity	11,365	29,147	—	40,512	40,827
Loans (a)	—	60,219	—	60,219	60,082
Other financial assets	5,382	1,244	—	6,626	6,626
Total	\$ 16,747	\$ 222,237	\$ —	\$ 238,984	\$ 239,159
Liabilities:					
Noninterest-bearing deposits	\$ —	\$ 82,716	\$ —	\$ 82,716	\$ 82,716
Interest-bearing deposits	—	160,042	—	160,042	161,606
Federal funds purchased and securities sold under repurchase agreements	—	15,163	—	15,163	15,163
Payables to customers and broker-dealers	—	20,184	—	20,184	20,184
Commercial paper	—	3,075	—	3,075	3,075
Borrowings	—	2,931	—	2,931	2,931
Long-term debt	—	27,789	—	27,789	27,612
Total	\$ —	\$ 311,900	\$ —	\$ 311,900	\$ 313,287

(a) Does not include the leasing portfolio.

Summary of financial instruments (in millions)	Dec. 31, 2016				
	Level 1	Level 2	Level 3	Total estimated fair value	Carrying amount
Assets:					
Interest-bearing deposits with the Federal Reserve and other central banks	\$ —	\$ 58,041	\$ —	\$ 58,041	\$ 58,041
Interest-bearing deposits with banks	—	15,091	—	15,091	15,086
Federal funds sold and securities purchased under resale agreements	—	25,801	—	25,801	25,801
Securities held-to-maturity	11,173	29,496	—	40,669	40,905
Loans (a)	—	62,829	—	62,829	62,564
Other financial assets	4,822	1,112	—	5,934	5,934
Total	\$ 15,995	\$ 192,370	\$ —	\$ 208,365	\$ 208,331
Liabilities:					
Noninterest-bearing deposits	\$ —	\$ 78,342	\$ —	\$ 78,342	\$ 78,342
Interest-bearing deposits	—	141,418	—	141,418	143,148
Federal funds purchased and securities sold under repurchase agreements	—	9,989	—	9,989	9,989
Payables to customers and broker-dealers	—	20,987	—	20,987	20,987
Borrowings	—	960	—	960	960
Long-term debt	—	24,184	—	24,184	24,100
Total	\$ —	\$ 275,880	\$ —	\$ 275,880	\$ 277,526

(a) Does not include the leasing portfolio.

The table below summarizes the carrying amount of the hedged financial instruments, the notional amount of the hedge and the unrealized gain (loss) (estimated fair value) of the derivatives.

Hedged financial instruments (in millions)	Carrying amount	Notional amount of hedge	Unrealized	
			Gain	(Loss)
Dec. 31, 2017				
Securities available-for-sale	\$ 12,307	\$ 12,365	\$ 102	\$ (301)
Long-term debt	23,821	23,950	175	(233)
Dec. 31, 2016				
Securities available-for-sale	\$ 9,184	\$ 9,233	\$ 83	\$ (342)
Long-term debt	20,511	20,450	330	(203)

Note 19 - Fair value option

We elected fair value as an alternative measurement for selected financial assets and liabilities. The following table presents the assets and liabilities of consolidated investment management funds, at fair value.

Assets and liabilities of consolidated investment management funds, at fair value (in millions)	Dec. 31,	
	2017	2016
Assets of consolidated investment management funds:		
Trading assets	\$ 516	\$ 979
Other assets	215	252
Total assets of consolidated investment management funds	\$ 731	\$ 1,231
Liabilities of consolidated investment management funds:		
Trading liabilities	\$ —	\$ 282
Other liabilities	2	33
Total liabilities of consolidated investment management funds	\$ 2	\$ 315

BNY Mellon values the assets and liabilities of its consolidated investment management funds using quoted prices for identical assets or liabilities in active markets or observable inputs such as quoted prices for similar assets or liabilities. Quoted prices for either identical or similar assets or liabilities in inactive markets may also be used. Accordingly, fair value best reflects the interests BNY Mellon holds in the economic performance of the consolidated investment management funds. Changes in the value of the assets and liabilities are recorded in the income statement as investment income of consolidated investment management funds and in the interest of investment management fund note holders, respectively.

We have elected the fair value option on \$240 million of long-term debt. The fair value of this long-term debt was \$367 million at Dec. 31, 2017 and \$363 million at Dec. 31, 2016. The long-term debt is

valued using observable market inputs and is included in Level 2 of the valuation hierarchy.

The following table presents the changes in fair value of long-term debt and certain loans for which we elected the fair value option that we previously held in 2016 and 2015, and the location of the changes in the income statement. There were no loans valued under the fair value option election at Dec. 31, 2017 and Dec. 31, 2016.

(in millions)	Impact of changes in fair value in the income statement (a)		
	Year ended Dec. 31,		
	2017	2016	2015
Loans:			
Investment and other income	\$ —	\$ 12	\$ 3
Long-term debt:			
Foreign exchange and other trading revenue	\$ (4)	\$ (4)	\$ (12)

(a) The changes in fair value of the loans and long-term debt are approximately offset by economic hedges included in foreign exchange and other trading revenue.

Note 20 - Commitments and contingent liabilities

Off-balance sheet arrangements

In the normal course of business, various commitments and contingent liabilities are outstanding that are not reflected in the accompanying consolidated balance sheets.

Our significant trading and off-balance sheet risks are securities, foreign currency and interest rate risk management products, commercial lending commitments, letters of credit and securities lending indemnifications. We assume these risks to reduce interest rate and foreign currency risks, to provide customers with the ability to meet credit and liquidity needs and to hedge foreign currency and interest rate risks. These items involve, to varying degrees, credit, foreign currency and interest rate risk not recognized on the balance sheet. Our off-balance sheet risks are managed and monitored in manners similar to those used for on-balance sheet risks.

The following table presents a summary of our off-balance sheet credit risks.

Off-balance sheet credit risks (in millions)	Dec. 31,	
	2017	2016
Lending commitments	\$ 51,467	\$ 51,270
Standby letters of credit (a)	3,531	4,185
Commercial letters of credit	122	339
Securities lending indemnifications (b)(c)	432,084	317,690

- (a) Net of participations totaling \$672 million at Dec. 31, 2017 and \$662 million at Dec. 31, 2016.
- (b) Excludes the indemnification for securities for which BNY Mellon acts as an agent on behalf of CIBC Mellon clients, which totaled \$69 billion at Dec. 31, 2017 and \$61 billion at Dec. 31, 2016.
- (c) Includes cash collateral, invested in indemnified repurchase agreements, held by us as securities lending agent of \$33 billion at Dec. 31, 2017 and \$28 billion at Dec. 31, 2016.

The total potential loss on undrawn lending commitments, standby and commercial letters of credit, and securities lending indemnifications is equal to the total notional amount if drawn upon, which does not consider the value of any collateral.

Since many of the lending commitments are expected to expire without being drawn upon, the total amount does not necessarily represent future cash requirements. A summary of lending commitment maturities is as follows: \$30.1 billion in less than one year, \$21.2 billion in one to five years and \$197 million over five years.

SBLCs principally support obligations of corporate clients and were collateralized with cash and securities of \$160 million at Dec. 31, 2017 and \$293 million at Dec. 31, 2016. At Dec. 31, 2017, \$2.5 billion of the SBLCs will expire within one year and \$1.0 billion in one to five years.

We must recognize, at the inception of an SBLC and foreign and other guarantees, a liability for the fair value of the obligation undertaken in issuing the guarantee. The fair value of the liability, which was recorded with a corresponding asset in other assets, was estimated as the present value of contractual customer fees. The estimated liability for losses related to SBLCs and foreign and other guarantees, if any, is included in the allowance for lending-related commitments. The allowance for lending-related commitments was \$102 million at Dec. 31, 2017 and \$112 million at Dec. 31, 2016.

Payment/performance risk of SBLCs is monitored using both historical performance and internal ratings criteria. BNY Mellon's historical experience is that SBLCs typically expire without being funded. SBLCs below investment grade are monitored closely for payment/performance risk. The table below shows SBLCs by investment grade:

Standby letters of credit	Dec. 31,	
	2017	2016
Investment grade	84%	89%
Non-investment grade	16%	11%

A commercial letter of credit is normally a short-term instrument used to finance a commercial contract for the shipment of goods from a seller to a buyer. Although the commercial letter of credit is contingent upon the satisfaction of specified conditions, it represents a credit exposure if the buyer defaults on the underlying transaction. As a result, the total contractual amounts do not necessarily represent future cash requirements. Commercial letters of credit totaled \$122 million at Dec. 31, 2017 and \$339 million at Dec. 31, 2016.

We expect many of the lending commitments and letters of credit to expire without the need to advance any cash. The revenue associated with guarantees frequently depends on the credit rating of the obligor and the structure of the transaction, including collateral, if any.

A securities lending transaction is a fully collateralized transaction in which the owner of a security agrees to lend the security (typically through an agent, in our case, The Bank of New York Mellon), to a borrower, usually a broker-dealer or bank, on an open, overnight or term basis, under the terms of a prearranged contract.

We typically lend securities with indemnification against borrower default. We generally require the borrower to provide collateral with a minimum value of 102% of the fair value of the securities borrowed, which is monitored on a daily basis, thus reducing credit risk. Market risk can also arise in securities lending transactions. These risks are controlled through policies limiting the level of risk that can be undertaken. Securities lending transactions are generally entered into only with highly rated counterparties. Securities lending indemnifications

were secured by collateral of \$451 billion at Dec. 31, 2017 and \$331 billion at Dec. 31, 2016.

CIBC Mellon, a joint venture between BNY Mellon and the Canadian Imperial Bank of Commerce ("CIBC"), engages in securities lending activities. CIBC Mellon, BNY Mellon and CIBC jointly and severally indemnify securities lenders against specific types of borrower default. At Dec. 31, 2017 and Dec. 31, 2016, \$69 billion and \$61 billion, respectively, of borrowings at CIBC Mellon, for which BNY Mellon acts as agent on behalf of CIBC Mellon clients, were secured by collateral of \$73 billion and \$64 billion, respectively. If, upon a default, a borrower's collateral was not sufficient to cover its related obligations, certain losses related to the indemnification could be covered by the indemnitors.

Industry concentrations

We have significant industry concentrations related to credit exposure at Dec. 31, 2017. The tables below present our credit exposure in the financial institutions and commercial portfolios.

Financial institutions portfolio exposure (in billions)	Dec. 31, 2017		
	Loans	Unfunded commitments	Total exposure
Securities industry	\$ 3.6	\$ 19.2	\$ 22.8
Banks	7.0	1.2	8.2
Asset managers	1.4	6.4	7.8
Insurance	0.1	3.5	3.6
Government	0.1	0.9	1.0
Other	0.9	1.3	2.2
Total	\$ 13.1	\$ 32.5	\$ 45.6

Commercial portfolio exposure (in billions)	Dec. 31, 2017		
	Loans	Unfunded commitments	Total exposure
Manufacturing	\$ 1.3	\$ 6.1	\$ 7.4
Services and other	0.9	6.0	6.9
Energy and utilities	0.7	4.4	5.1
Media and telecom	—	1.5	1.5
Total	\$ 2.9	\$ 18.0	\$ 20.9

Major concentrations in securities lending are primarily to broker-dealers and are generally collateralized with cash and/or securities.

Operating leases

Net rent expense for premises and equipment was \$285 million in 2017, \$301 million in 2016 and \$329 million in 2015.

At Dec. 31, 2017, we were obligated under various noncancelable lease agreements, some of which provide for additional rents based upon real estate taxes, insurance and maintenance and for various renewal options. A summary of the future minimum rental commitments under noncancelable operating leases, net of related sublease revenue, is as follows: 2018—\$292 million; 2019—\$279 million; 2020—\$262 million; 2021—\$227 million; 2022—\$204 million and 2023 and thereafter—\$754 million.

Exposure for certain administrative errors

In connection with certain offshore tax-exempt funds that we manage, we may be liable to the funds for certain administrative errors. The errors relate to the resident status of such funds, potentially exposing the Company to a tax liability related to the funds' earnings. The Company is in discussions with tax authorities regarding the funds. We believe we are appropriately accrued and the additional reasonably possible exposure is not significant.

Indemnification arrangements

We have provided standard representations for underwriting agreements, acquisition and divestiture agreements, sales of loans and commitments, and other similar types of arrangements and customary indemnification for claims and legal proceedings related to providing financial services that are not otherwise included above. Insurance has been purchased to mitigate certain of these risks. Generally, there are no stated or notional amounts included in these indemnifications and the contingencies triggering the obligation for indemnification are not expected to occur. Furthermore, often counterparties to these transactions provide us with comparable indemnifications. We are unable to develop an estimate of the maximum payout under these indemnifications for several reasons. In addition to the lack of a stated or notional amount in a majority of such indemnifications, we are unable to predict the nature of events that would trigger indemnification or the level of indemnification for a certain event. We believe, however, that the possibility that we will have to make any material payments for these indemnifications is remote. At Dec. 31, 2017 and Dec. 31, 2016, we have not recorded any material liabilities under these arrangements.

Clearing and settlement exchanges

We are a noncontrolling equity investor in, and/or member of, several industry clearing or settlement exchanges through which foreign exchange, securities, derivatives or other transactions settle. Certain of these industry clearing and settlement exchanges require their members to guarantee their obligations and liabilities and/or to provide liquidity support in the event other members do not honor their obligations. We believe the likelihood that a clearing or settlement exchange (of which we are a member) would become insolvent is remote. Additionally, certain settlement exchanges have implemented loss allocation policies that enable the exchange to allocate settlement losses to the members of the exchange. It is not possible to quantify such mark-to-market loss until the loss occurs. Any ancillary costs that occur as a result of any mark-to-market loss cannot be quantified. In addition, we also sponsor clients as members on clearing and settlement exchanges and guarantee their obligations. At Dec. 31, 2017 and Dec. 31, 2016, we have not recorded any material liabilities under these arrangements.

Legal proceedings

In the ordinary course of business, BNY Mellon and its subsidiaries are routinely named as defendants in or made parties to pending and potential legal actions. We also are subject to governmental and regulatory examinations, information-gathering requests, investigations and proceedings (both formal and informal). Claims for significant monetary damages are often asserted in many of these legal actions, while claims for disgorgement, restitution, penalties and/or other remedial actions or sanctions may be sought in governmental and regulatory matters. It is inherently difficult to predict the eventual outcomes of such matters given their complexity and the particular facts and circumstances at issue in each of these matters. However, on the basis of our current knowledge and understanding, we do not believe that judgments, settlements or orders, if any, arising from these matters (either individually or in the aggregate, after giving effect to applicable reserves and insurance coverage) will have a material adverse effect on the consolidated financial position or liquidity of BNY Mellon, although they could have a material effect on net income in a given period.

In view of the inherent unpredictability of outcomes in litigation and governmental and regulatory matters,

particularly where (i) the damages sought are substantial or indeterminate, (ii) the proceedings are in the early stages, or (iii) the matters involve novel legal theories or a large number of parties, as a matter of course there is considerable uncertainty surrounding the timing or ultimate resolution of litigation and governmental and regulatory matters, including a possible eventual loss, fine, penalty or business impact, if any, associated with each such matter. In accordance with applicable accounting guidance, BNY Mellon establishes accruals for litigation and governmental and regulatory matters when those matters proceed to a stage where they present loss contingencies that are both probable and reasonably estimable. In such cases, there may be a possible exposure to loss in excess of any amounts accrued. BNY Mellon will continue to monitor such matters for developments that could affect the amount of the accrual, and will adjust the accrual amount as appropriate. If the loss contingency in question is not both probable and reasonably estimable, BNY Mellon does not establish an accrual and the matter will continue to be monitored for any developments that would make the loss contingency both probable and reasonably estimable. BNY Mellon believes that its accruals for legal proceedings are appropriate and, in the aggregate, are not material to the consolidated financial position of BNY Mellon, although future accruals could have a material effect on net income in a given period.

For certain of those matters described here for which a loss contingency may, in the future, be reasonably possible (whether in excess of a related accrued liability or where there is no accrued liability), BNY Mellon is currently unable to estimate a range of reasonably possible loss. For those matters described here where BNY Mellon is able to estimate a reasonably possible loss, the aggregate range of such reasonably possible loss is up to \$840 million in excess of the accrued liability (if any) related to those matters.

The following describes certain judicial, regulatory and arbitration proceedings involving BNY Mellon:

Mortgage-Securitization Trusts Proceedings

The Bank of New York Mellon has been named as a defendant in a number of legal actions brought by MBS investors alleging that the trustee has expansive duties under the governing agreements, including the duty to investigate and pursue breach of representation and warranty claims against other

parties to the MBS transactions. These actions include a lawsuit brought in New York State court on June 18, 2014, and later re-filed in federal court, by a group of institutional investors who purport to sue on behalf of 249 MBS trusts.

Matters Related to R. Allen Stanford

In late December 2005, Pershing LLC (“Pershing”) became a clearing firm for Stanford Group Co. (“SGC”), a registered broker-dealer that was part of a group of entities ultimately controlled by R. Allen Stanford (“Stanford”). Stanford International Bank (“SIB”), also controlled by Stanford, issued certificates of deposit (“CDs”). Some investors allegedly wired funds from their SGC accounts to purchase CDs. In 2009, the SEC charged Stanford with operating a Ponzi scheme in connection with the sale of CDs, and SGC was placed into receivership. Alleged purchasers of CDs have filed 15 lawsuits against Pershing that are pending in Texas, including two putative class actions. The purchasers allege that Pershing, as SGC’s clearing firm, assisted Stanford in a fraudulent scheme and assert contractual, statutory and common law claims. In addition, two FINRA arbitration proceedings have been initiated by alleged purchasers asserting similar claims.

Brazilian Postalis Litigation

BNY Mellon Servicos Financeiros DTVM S.A. (“DTVM”), a subsidiary that provides a number of asset services in Brazil, acts as administrator for certain investment funds in which the exclusive investor is a public pension fund for postal workers called Postalis-Instituto de Seguridade Social dos Correios e Telégrafos (“Postalis”). On Aug. 22, 2014, Postalis sued DTVM in Rio de Janeiro, Brazil for losses related to a Postalis investment fund for which DTVM serves as fund administrator. Postalis alleges that DTVM failed to properly perform alleged duties, including duties to conduct due diligence of and exert control over the fund manager, Atlântica Administração de Recursos (“Atlântica”), and Atlântica’s investments. On March 12, 2015, Postalis filed a lawsuit in Rio de Janeiro against DTVM and BNY Mellon Administração de Ativos Ltda. (“Ativos”) alleging failure to properly perform alleged duties relating to another fund of which DTVM is administrator and Ativos is investment manager. On Dec. 14, 2015, Associação Dos Profissionais Dos Correios (“ADCAP”), a Brazilian postal workers association, filed a lawsuit in São Paulo against DTVM and other defendants alleging that DTVM improperly contributed to investment

losses in the Postalis portfolio. On March 20, 2017, the lawsuit was dismissed without prejudice, and ADCAP has appealed that decision. On Dec. 17, 2015, Postalis filed three additional lawsuits in Rio de Janeiro against DTVM and Ativos alleging failure to properly perform alleged duties and liabilities for losses with respect to investments in several other funds. On Feb. 4, 2016, Postalis filed another lawsuit in Brasilia against DTVM, Ativos and BNY Mellon Alocação de Patrimônio Ltda., an investment management subsidiary, alleging failure to properly perform duties and liability for losses with respect to investments in various other funds of which the defendants were administrator and/or manager. The lawsuit has been transferred to São Paulo. On Jan. 16, 2018, the Brazilian Federal Prosecutor's Office filed a civil lawsuit in São Paulo against DTVM alleging liability for Postalis losses based on alleged failures by DTVM to properly perform certain duties while acting as administrator and/or manager to certain funds in which Postalis invested.

Depository Receipt Litigation

Between late December 2015 and February 2016, four putative class action lawsuits were filed against BNY Mellon asserting claims relating to BNY Mellon's foreign exchange pricing when converting dividends and other distributions from non-U.S. companies in its role as depository bank to Depository Receipt issuers. The claims are for breach of contract and violations of ERISA. The lawsuits have been consolidated into two suits that are pending in federal court in the Southern District of New York.

Brazilian Silverado Litigation

DTVM acts as administrator for the Fundo de Investimento em Direitos Creditórios Multisetorial Silverado Maximum ("Silverado Maximum Fund"), which invests in commercial credit receivables. On June 2, 2016, the Silverado Maximum Fund sued DTVM in its capacity as administrator, along with Deutsche Bank S.A. - Banco Alemão in its capacity as custodian and Silverado Gestão e Investimentos Ltda. in its capacity as investment manager. The Fund alleges that each of the defendants failed to fulfill its respective duty, and caused losses to the Fund for which the defendants are jointly and severally liable.

Depository Receipt Pre-Release Inquiry

In March 2014, the Staff of the U.S. Securities and Exchange Commission's Enforcement Division (the "Staff") commenced an investigation into certain

issuers of American Depositary Receipts ("ADRs"), including BNY Mellon, for the period of 2011 to 2015. The Staff has issued several requests to BNY Mellon for information relating to the pre-release of ADRs. In May 2017, BNY Mellon began discussions with the Staff about a possible resolution of the investigation. BNY Mellon has fully cooperated with this matter.

Note 21 - Derivative instruments

We use derivatives to manage exposure to market risk, including interest rate risk, equity price risk and foreign currency risk, as well as credit risk. Our trading activities are focused on acting as a market-maker for our customers and facilitating customer trades in compliance with the Volcker Rule.

The notional amounts for derivative financial instruments express the dollar volume of the transactions; however, credit risk is much smaller. We perform credit reviews and enter into netting agreements and collateral arrangements to minimize the credit risk of derivative financial instruments. We enter into offsetting positions to reduce exposure to foreign currency, interest rate and equity price risk.

Use of derivative financial instruments involves reliance on counterparties. Failure of a counterparty to honor its obligation under a derivative contract is a risk we assume whenever we engage in a derivative contract. There were no counterparty default losses recorded in 2017 or 2016.

Hedging derivatives

We utilize interest rate swap agreements to manage our exposure to interest rate fluctuations. For hedges of available-for-sale investment securities, deposits and long-term debt, the hedge documentation specifies the terms of the hedged items and the interest rate swaps and indicates that the derivative is hedging a fixed rate item and is a fair value hedge, that the hedge exposure is to the changes in the fair value of the hedged item due to changes in benchmark interest rates, and that the strategy is to eliminate fair value variability by converting fixed rate interest payments to LIBOR.

The available-for-sale investment securities hedged consist of U.S. Treasury bonds, agency commercial MBS, sovereign debt and covered bonds that had original maturities of 30 years or less at initial

purchase. At Dec. 31, 2017, \$12.3 billion face amount of available-for-sale securities were hedged with interest rate swaps designated as fair value hedges that had notional values of \$12.3 billion.

The fixed rate long-term debt instruments hedged generally have original maturities of five to 30 years. We issue both callable and non-callable debt. The debt is hedged with “receive fixed rate, pay variable rate” swaps. At Dec. 31, 2017, \$24.0 billion par value of debt was hedged with interest rate swaps that had notional values of \$24.0 billion.

In addition, we enter into foreign exchange hedges. We use forward foreign exchange contracts with maturities of 15 months or less to hedge our Indian rupee, British pound, Hong Kong dollar, Singapore dollar, Canadian dollar and Polish zloty foreign exchange exposure with respect to foreign currency forecasted revenue and expense transactions in entities that have the U.S. dollar as their functional currency. As of Dec. 31, 2017, the hedged forecasted foreign currency transactions and designated forward foreign exchange contract hedges were \$415 million (notional), with a pre-tax gain of \$12 million recorded in accumulated other comprehensive income. This gain will be reclassified to income or expense over the next 12 months.

Forward foreign exchange contracts are also used to hedge the value of our net investments in foreign subsidiaries. These forward foreign exchange contracts have maturities of less than one year. The derivatives employed are designated as hedges of

changes in value of our foreign investments due to exchange rates. Changes in the value of the forward foreign exchange contracts offset the changes in value of the foreign investments due to changes in foreign exchange rates. The change in fair market value of these forward foreign exchange contracts is deferred and reported within foreign currency translation adjustments in shareholders’ equity, net of tax. At Dec. 31, 2017, forward foreign exchange contracts with notional amounts totaling \$8.3 billion were designated as hedges.

In addition to forward foreign exchange contracts, we also designate non-derivative financial instruments as hedges of our net investments in foreign subsidiaries. Those non-derivative financial instruments designated as hedges of our net investments in foreign subsidiaries were all long-term liabilities of BNY Mellon in various currencies, and, at Dec. 31, 2017, had a combined U.S. dollar equivalent value of \$184 million.

Ineffectiveness related to derivatives and hedging relationships was recorded in income as follows:

Ineffectiveness (in millions)	Year ended Dec. 31,		
	2017	2016	2015
Fair value hedges of securities	\$ (14.8)	\$ (0.5)	\$ 4.1
Fair value hedges of long-term debt	(6.7)	(3.1)	(6.3)
Cash flow hedges	6.0	—	—
Other (a)	—	—	—
Total	\$ (15.5)	\$ (3.6)	\$ (2.2)

(a) Includes ineffectiveness recorded on net investment foreign exchange hedges.

The following table summarizes the notional amount and credit exposure of our total derivative portfolio at Dec. 31, 2017 and Dec. 31, 2016.

Impact of derivative instruments on the balance sheet <i>(in millions)</i>	Notional value		Asset derivatives fair value		Liability derivatives fair value	
	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2017	Dec. 31, 2016
	Derivatives designated as hedging instruments: (a)					
Interest rate contracts	\$ 36,315	\$ 29,683	\$ 278	\$ 415	\$ 534	\$ 545
Foreign exchange contracts	8,923	7,796	45	369	266	52
Total derivatives designated as hedging instruments			\$ 323	\$ 784	\$ 800	\$ 597
Derivatives not designated as hedging instruments: (b)						
Interest rate contracts	\$ 267,485	\$ 325,412	\$ 6,439	\$ 7,587	\$ 6,353	\$ 7,633
Foreign exchange contracts	767,999	530,729	5,104	6,104	5,067	6,103
Equity contracts	1,698	1,167	70	46	149	112
Credit contracts	180	160	—	—	4	3
Total derivatives not designated as hedging instruments			\$ 11,613	\$ 13,737	\$ 11,573	\$ 13,851
Total derivatives fair value (c)			\$ 11,936	\$ 14,521	\$ 12,373	\$ 14,448
Effect of master netting agreements (d)			(8,845)	(10,257)	(8,797)	(10,047)
Fair value after effect of master netting agreements			\$ 3,091	\$ 4,264	\$ 3,576	\$ 4,401

- (a) The fair value of asset derivatives and liability derivatives designated as hedging instruments is recorded as other assets and other liabilities, respectively, on the balance sheet.
- (b) The fair value of asset derivatives and liability derivatives not designated as hedging instruments is recorded as trading assets and trading liabilities, respectively, on the balance sheet.
- (c) Fair values are on a gross basis, before consideration of master netting agreements, as required by ASC 815, Derivatives and Hedging.
- (d) Effect of master netting agreements includes cash collateral received and paid of \$925 million and \$877 million, respectively, at Dec. 31, 2017, and \$1,119 million and \$909 million, respectively, at Dec. 31, 2016.

The following tables present the impact of derivative instruments used in fair value, cash flow and net investment hedging relationships in the income statement.

Impact of derivative instruments in the income statement <i>(in millions)</i>								
Derivatives in fair value hedging relationships	Location of gain or (loss) recognized in income on derivatives	Gain or (loss) recognized in income on derivatives Year ended Dec. 31,			Location of gain or (loss) recognized in income on hedged item	Gain or (loss) recognized in hedged item Year ended Dec. 31,		
		2017	2016	2015		2017	2016	2015
Interest rate contracts	Net interest revenue	\$ (115)	\$ (274)	\$ (85)	Net interest revenue	\$ 93	\$ 270	\$ 83

Derivatives in cash flow hedging relationships	Gain or (loss) recognized in accumulated OCI on derivatives (effective portion) Year ended Dec. 31,			Location of gain or (loss) reclassified from accumulated OCI into income (effective portion)	Gain or (loss) reclassified from accumulated OCI into income (effective portion) Year ended Dec. 31,			Location of gain or (loss) recognized in income on derivatives (ineffective portion and amount excluded from effectiveness testing)	Gain or (loss) recognized in income on derivatives (ineffectiveness portion and amount excluded from effectiveness testing) Year ended Dec. 31,		
	2017	2016	2015		2017	2016	2015		2017	2016	2015
FX contracts	\$ —	\$ (18)	\$ (1)	Net interest revenue	\$ —	\$ (18)	\$ (1)	Net interest revenue	\$ —	\$ —	\$ —
FX contracts	2	—	—	Other revenue	2	—	—	Other revenue	6	—	—
FX contracts	1	(16)	9	Trading revenue	2	(16)	9	Trading revenue	—	—	—
FX contracts	30	(18)	(8)	Salary expense	10	(11)	(19)	Salary expense	—	—	—
Total	\$ 33	\$ (52)	\$ —		\$ 14	\$ (45)	\$ (11)		\$ 6	\$ —	\$ —

Derivatives in net investment hedging relationships	Gain or (loss) recognized in accumulated OCI on derivatives (effective portion) Year ended Dec. 31,			Location of gain or (loss) reclassified from accumulated OCI into income (effective portion)	Gain or (loss) reclassified from accumulated OCI into income (effective portion) Year ended Dec. 31,			Location of gain or (loss) recognized in income on derivatives (ineffective portion and amount excluded from effectiveness testing)	Gain or (loss) recognized in income on derivatives (ineffectiveness portion and amount excluded from effectiveness testing) Year ended Dec. 31,		
	2017	2016	2015		2017	2016	2015		2017	2016	2015
FX contracts	\$ (625)	\$ 652	\$ 474	Net interest revenue	\$ —	\$ —	\$ 1	Other revenue	\$ —	\$ —	\$ —

Trading activities (including trading derivatives)

We manage trading risk through a system of position limits, a VaR methodology based on historical simulation and other market sensitivity measures. Risk is monitored and reported to senior management by a separate unit, independent from trading, on a daily basis. Based on certain assumptions, the VaR methodology is designed to capture the potential overnight pre-tax dollar loss from adverse changes in fair values of all trading positions. The calculation assumes a one-day holding period, utilizes a 99% confidence level and incorporates non-linear product characteristics. The VaR model is one of several statistical models used to develop economic capital results, which are allocated to lines of business for computing risk-adjusted performance.

As the VaR methodology does not evaluate risk attributable to extraordinary financial, economic or other occurrences, the risk assessment process includes a number of stress scenarios based upon the risk factors in the portfolio and management's assessment of market conditions. Additional stress scenarios based upon historical market events are also performed. Stress tests may incorporate the impact of reduced market liquidity and the breakdown of historically observed correlations and extreme scenarios. VaR and other statistical measures, stress testing and sensitivity analysis are incorporated in other risk management materials.

The following table presents our foreign exchange and other trading revenue.

Foreign exchange and other trading revenue (in millions)	Year ended Dec. 31,		
	2017	2016	2015
Foreign exchange	\$ 638	\$ 687	\$ 743
Other trading revenue	30	14	25
Total foreign exchange and other trading revenue	\$ 668	\$ 701	\$ 768

Foreign exchange revenue includes income from purchasing and selling foreign currencies and

currency forwards, futures and options. Other trading revenue reflects results from trading in cash instruments including fixed income and equity securities and non-foreign exchange derivatives.

Counterparty credit risk and collateral

We assess credit risk of our counterparties through regular examination of their financial statements, confidential communication with the management of those counterparties and regular monitoring of publicly available credit rating information. This and other information is used to develop proprietary credit rating metrics used to assess credit quality.

Collateral requirements are determined after a comprehensive review of the credit quality of each counterparty. Collateral is generally held or pledged in the form of cash or highly liquid government securities. Collateral requirements are monitored and adjusted daily.

Additional disclosures concerning derivative financial instruments are provided in Note 18 of the Notes to Consolidated Financial Statements.

Disclosure of contingent features in OTC derivative instruments

Certain OTC derivative contracts and/or collateral agreements of The Bank of New York Mellon, our largest banking subsidiary and the subsidiary through which BNY Mellon enters into the substantial majority of its OTC derivative contracts and/or collateral agreements, contain provisions that may require us to take certain actions if The Bank of New York Mellon's public debt rating fell to a certain level. Early termination provisions, or "close-out" agreements, in those contracts could trigger immediate payment of outstanding contracts that are in net liability positions. Certain collateral agreements would require The Bank of New York Mellon to immediately post additional collateral to cover some or all of The Bank of New York Mellon's liabilities to a counterparty.

The following table shows the fair value of contracts falling under early termination provisions that were in net liability positions as of Dec. 31, 2017 for three key ratings triggers.

If The Bank of New York Mellon's rating was changed to (Moody's/S&P)	Potential close-out exposures (fair value) (a)
A3/A-	\$ 92 million
Baa2/BBB	\$ 748 million
Ba1/BB+	\$ 2,007 million

(a) The amounts represent potential total close-out values if The Bank of New York Mellon's rating were to immediately drop to the indicated levels.

The aggregated fair value of contracts impacting potential trade close-out amounts and collateral obligations can fluctuate from quarter to quarter due to changes in market conditions, changes in the composition of counterparty trades, new business or changes to the agreement definitions establishing close-out or collateral obligations.

If The Bank of New York Mellon's debt rating had fallen below investment grade on Dec. 31, 2017, existing collateral arrangements would have required us to post an additional \$102 million of collateral.

Offsetting assets and liabilities

The following tables present derivative instruments and financial instruments that are either subject to an enforceable netting agreement or offset by collateral arrangements. There were no derivative instruments or financial instruments subject to a legally enforceable netting agreement for which we are not currently netting.

Offsetting of derivative assets and financial assets at Dec. 31, 2017

(in millions)	Gross assets recognized	Gross amounts offset in the balance sheet (a)	Net assets recognized on the balance sheet	Gross amounts not offset in the balance sheet		Net amount
				Financial instruments	Cash collateral received	
Derivatives subject to netting arrangements:						
Interest rate contracts	\$ 5,915	\$ 5,075	\$ 840	\$ 178	\$ —	\$ 662
Foreign exchange contracts	4,666	3,720	946	116	—	830
Equity and other contracts	67	50	17	—	—	17
Total derivatives subject to netting arrangements	10,648	8,845	1,803	294	—	1,509
Total derivatives not subject to netting arrangements	1,288	—	1,288	—	—	1,288
Total derivatives	11,936	8,845	3,091	294	—	2,797
Reverse repurchase agreements	42,784	25,848 (b)	16,936	16,923	—	13
Securities borrowing	11,199	—	11,199	10,858	—	341
Total	\$ 65,919	\$ 34,693	\$ 31,226	\$ 28,075	\$ —	\$ 3,151

Offsetting of derivative assets and financial assets at Dec. 31, 2016

(in millions)	Gross assets recognized	Gross amounts offset in the balance sheet (a)	Net assets recognized on the balance sheet	Gross amounts not offset in the balance sheet		Net amount
				Financial instruments	Cash collateral received	
Derivatives subject to netting arrangements:						
Interest rate contracts	\$ 7,205	\$ 6,047	\$ 1,158	\$ 321	\$ —	\$ 837
Foreign exchange contracts	5,265	4,172	1,093	202	—	891
Equity and other contracts	44	38	6	—	—	6
Total derivatives subject to netting arrangements	12,514	10,257	2,257	523	—	1,734
Total derivatives not subject to netting arrangements	2,007	—	2,007	—	—	2,007
Total derivatives	14,521	10,257	4,264	523	—	3,741
Reverse repurchase agreements	17,588	481 (b)	17,107	17,104	—	3
Securities borrowing	8,694	—	8,694	8,425	—	269
Total	\$ 40,803	\$ 10,738	\$ 30,065	\$ 26,052	\$ —	\$ 4,013

(a) Includes the effect of netting agreements and net cash collateral received. The offset related to the OTC derivatives was allocated to the various types of derivatives based on the net positions.

(b) Offsetting of reverse repurchase agreements relates to our involvement in the Fixed Income Clearing Corporation, where we settle government securities transactions on a net basis for payment and delivery through the Fedwire system.

Notes to Consolidated Financial Statements (continued)
Offsetting of derivative liabilities and financial liabilities at Dec. 31, 2017

<i>(in millions)</i>	Gross liabilities recognized	Gross amounts offset in the balance sheet	<i>(a)</i>	Net liabilities recognized on the balance sheet	Gross amounts not offset in the balance sheet		Net amount
					Financial instruments	Cash collateral pledged	
Derivatives subject to netting arrangements:							
Interest rate contracts	\$ 6,810	\$ 5,495		\$ 1,315	\$ 1,222	\$ —	\$ 93
Foreign exchange contracts	4,765	3,221		1,544	177	—	1,367
Equity and other contracts	143	81		62	58	—	4
Total derivatives subject to netting arrangements	11,718	8,797		2,921	1,457	—	1,464
Total derivatives not subject to netting arrangements	655	—		655	—	—	655
Total derivatives	12,373	8,797		3,576	1,457	—	2,119
Repurchase agreements	33,908	25,848	<i>(b)</i>	8,060	8,059	—	1
Securities lending	2,186	—		2,186	2,091	—	95
Total	\$ 48,467	\$ 34,645		\$ 13,822	\$ 11,607	\$ —	\$ 2,215

Offsetting of derivative liabilities and financial liabilities at Dec. 31, 2016

<i>(in millions)</i>	Gross liabilities recognized	Gross amounts offset in the balance sheet	<i>(a)</i>	Net liabilities recognized on the balance sheet	Gross amounts not offset in the balance sheet		Net amount
					Financial instruments	Cash collateral pledged	
Derivatives subject to netting arrangements:							
Interest rate contracts	\$ 8,116	\$ 6,634		\$ 1,482	\$ 1,266	\$ —	\$ 216
Foreign exchange contracts	4,957	3,363		1,594	355	—	1,239
Equity and other contracts	104	50		54	54	—	—
Total derivatives subject to netting arrangements	13,177	10,047		3,130	1,675	—	1,455
Total derivatives not subject to netting arrangements	1,271	—		1,271	—	—	1,271
Total derivatives	14,448	10,047		4,401	1,675	—	2,726
Repurchase agreements	8,703	481	<i>(b)</i>	8,222	8,222	—	—
Securities lending	1,615	—		1,615	1,522	—	93
Total	\$ 24,766	\$ 10,528		\$ 14,238	\$ 11,419	\$ —	\$ 2,819

(a) Includes the effect of netting agreements and net cash collateral paid. The offset related to the OTC derivatives was allocated to the various types of derivatives based on the net positions.

(b) Offsetting of repurchase agreements relates to our involvement in the Fixed Income Clearing Corporation, where we settle government securities transactions on a net basis for payment and delivery through the Fedwire system.

Secured borrowings

The following table presents the contract value of repurchase agreements and securities lending transactions accounted for as secured borrowings by the type of collateral provided to counterparties.

Repurchase agreements and securities lending transactions accounted for as secured borrowings									
<i>(in millions)</i>	Dec. 31, 2017				Dec. 31, 2016				
	Remaining contractual maturity				Remaining contractual maturity				
	Overnight and continuous	Up to 30 days	30 days or more	Total	Overnight and continuous	Up to 30 days	30 days or more	Total	
Repurchase agreements:									
U.S. Treasury	\$ 26,883	\$ 11	\$ —	\$ 26,894	\$ 2,488	\$ 4	\$ —	\$ 2,492	
U.S. government agencies	570	180	—	750	396	10	—	406	
Agency RMBS	2,574	109	—	2,683	3,294	386	—	3,680	
Corporate bonds	373	—	1,052	1,425	304	—	694	998	
Other debt securities	253	—	731	984	146	—	563	709	
Equity securities	655	—	517	1,172	375	—	43	418	
Total	\$ 31,308	\$ 300	\$ 2,300	\$ 33,908	\$ 7,003	\$ 400	\$ 1,300	\$ 8,703	
Securities lending:									
U.S. government agencies	\$ 72	\$ —	\$ —	\$ 72	\$ 39	\$ —	\$ —	\$ 39	
Other debt securities	316	—	—	316	477	—	—	477	
Equity securities	1,798	—	—	1,798	1,099	—	—	1,099	
Total	\$ 2,186	\$ —	\$ —	\$ 2,186	\$ 1,615	\$ —	\$ —	\$ 1,615	
Total borrowings	\$ 33,494	\$ 300	\$ 2,300	\$ 36,094	\$ 8,618	\$ 400	\$ 1,300	\$ 10,318	

BNY Mellon's repurchase agreements and securities lending transactions primarily encounter risk associated with liquidity. We are required to pledge collateral based on predetermined terms within the agreements. If we were to experience a decline in the fair value of the collateral pledged for these transactions, we could be required to provide additional collateral to the counterparty, therefore decreasing the amount of assets available for other liquidity needs that may arise. BNY Mellon also offers tri-party collateral agency services in the tri-party repo market where we are exposed to credit risk. In order to mitigate this risk, we require dealers to fully secure intraday credit.

Note 22 - Lines of business

We have an internal information system that produces performance data along product and service lines for our two principal businesses and the Other segment.

Business accounting principles

Our business data has been determined on an internal management basis of accounting, rather than the generally accepted accounting principles used for consolidated financial reporting. These measurement principles are designed so that reported results of the businesses will track their economic performance.

Business results are subject to reclassification when organizational changes are made. There were no significant organizational changes in 2017. The results are also subject to refinements in revenue and expense allocation methodologies, which are typically reflected on a prospective basis.

The accounting policies of the businesses are the same as those described in Note 1 of the Notes to Consolidated Financial Statements.

The primary types of revenue for our two principal businesses and the Other segment are presented below.

Business	Primary types of revenue
Investment Management	<ul style="list-style-type: none"> • Investment management and performance fees from: <ul style="list-style-type: none"> Mutual funds Institutional clients Private clients High-net-worth individuals and families, endowments and foundations and related entities • Distribution and servicing fees • Other revenue from seed capital investments
Investment Services	<ul style="list-style-type: none"> • Asset servicing fees, including custody fees, fund services, broker-dealer services, securities finance and collateral and liquidity services • Issuer services fees, including Depositary Receipts and Corporate Trust • Clearing services fees • Treasury services fees, including global payments, trade finance and cash management • Foreign exchange revenue • Financing-related fees and net interest revenue from credit-related activities
Other segment	<ul style="list-style-type: none"> • Net interest revenue and lease-related gains (losses) from leasing operations • Gain (loss) on securities and net interest revenue from corporate treasury activity • Other trading revenue from derivatives and other trading activity • Results of business exits

The results of our businesses are presented and analyzed on an internal management reporting basis.

- Revenue amounts reflect fee and other revenue generated by each business. Fee and other revenue transferred between businesses under revenue transfer agreements is included within other revenue in each business.
 - Revenues and expenses associated with specific client bases are included in those businesses. For example, foreign exchange activity associated with clients using custody products is included in Investment Services.
 - Net interest revenue is allocated to businesses based on the yields on the assets and liabilities generated by each business. We employ a funds transfer pricing system that matches funds with the specific assets and liabilities of each business based on their interest sensitivity and maturity characteristics.
 - The provision for credit losses associated with the respective credit portfolios is reflected in each business segment.
 - Incentives expense related to restricted stock is allocated to the businesses.
 - Support and other indirect expenses are allocated to businesses based on internally developed methodologies.
 - Recurring FDIC expense is allocated to the businesses based on average deposits generated within each business.
 - Litigation expense is generally recorded in the business in which the charge occurs.
 - Management of the investment securities portfolio is a shared service contained in the Other segment. As a result, gains and losses associated with the valuation of the securities portfolio are included in the Other segment.
 - Client deposits serve as the primary funding source for our investment securities portfolio. We typically allocate all interest revenue to the businesses generating the deposits. Accordingly, accretion related to the portion of the investment securities portfolio restructured in 2009 has been included in the results of the businesses.
 - M&I expense is a corporate level item and is recorded in the Other segment.
 - Restructuring charges relate to corporate-level initiatives and were therefore recorded in the Other segment.
 - Balance sheet assets and liabilities and their related income or expense are specifically assigned to each business. Businesses with a net liability position have been allocated assets.
 - Goodwill and intangible assets are reflected within individual businesses.
- Total revenue includes approximately \$2.4 billion in 2017, \$2.2 billion in 2016 and \$2.3 billion in 2015 of international operations domiciled in the UK which comprised 15%, 14% and 15% of total revenue, respectively.

The following consolidating schedules present the contribution of our businesses to our overall profitability.

For the year ended Dec. 31, 2017 (dollar amounts in millions)	Investment Management	Investment Services	Other	Consolidated
Fee and other revenue	\$ 3,668 (a)	\$ 8,527	\$ 7	\$ 12,202 (a)
Net interest revenue (expense)	329	3,058	(79)	3,308
Total revenue	3,997 (a)	11,585	(72)	15,510 (a)
Provision for credit losses	2	(7)	(19)	(24)
Noninterest expense	2,854	7,747	347	10,948 (b)
Income before taxes	\$ 1,141 (a)	\$ 3,845	\$ (400)	\$ 4,586 (a)(b)
Pre-tax operating margin (c)	29%	33%	N/M	30%
Average assets	\$ 31,450	\$ 254,646	\$ 57,752	\$ 343,848

- (a) Both total fee and other revenue and total revenue include net income from consolidated investment management funds of \$37 million, representing \$70 million of income and noncontrolling interests of \$33 million. Income before taxes is net of noncontrolling interests of \$33 million.
- (b) Noninterest expense includes a loss attributable to noncontrolling interest of \$9 million related to other consolidated subsidiaries.
- (c) Income before taxes divided by total revenue.

For the year ended Dec. 31, 2016 (dollar amounts in millions)	Investment Management	Investment Services	Other	Consolidated
Fee and other revenue	\$ 3,424 (a)	\$ 8,299	\$ 366	\$ 12,089 (a)
Net interest revenue	327	2,797	14	3,138
Total revenue	3,751 (a)	11,096	380	15,227 (a)
Provision for credit losses	6	8	(25)	(11)
Noninterest expense	2,778	7,342	394	10,514 (b)
Income before taxes	\$ 967 (a)	\$ 3,746	\$ 11	\$ 4,724 (a)(b)
Pre-tax operating margin (c)	26%	34%	N/M	31%
Average assets	\$ 30,169	\$ 273,808	\$ 54,500	\$ 358,477

- (a) Both total fee and other revenue and total revenue include net income from consolidated investment management funds of \$16 million, representing \$26 million of income and noncontrolling interests of \$10 million. Income before taxes is net of noncontrolling interests of \$10 million.
- (b) Noninterest expense includes a loss attributable to noncontrolling interest of \$9 million related to other consolidated subsidiaries.
- (c) Income before taxes divided by total revenue.

For the year ended Dec. 31, 2015 (dollar amounts in millions)	Investment Management	Investment Services	Other	Consolidated
Fee and other revenue	\$ 3,587 (a)	\$ 8,177	\$ 336	\$ 12,100 (a)
Net interest revenue	319	2,622	85	3,026
Total revenue	3,906 (a)	10,799	421	15,126 (a)
Provision for credit losses	(1)	28	133	160
Noninterest expense	2,859	7,502	434	10,795 (b)
Income before taxes	\$ 1,048 (a)	\$ 3,269	\$ (146)	\$ 4,171 (a)(b)
Pre-tax operating margin (c)	27%	30%	N/M	28%
Average assets	\$ 30,928	\$ 286,617	\$ 54,642	\$ 372,187

- (a) Both total fee and other revenue and total revenue include net income from consolidated investment management funds of \$18 million, representing \$86 million of income and noncontrolling interests of \$68 million. Income before taxes is net of noncontrolling interests of \$68 million.
- (b) Noninterest expense includes a loss attributable to noncontrolling interest of \$4 million related to other consolidated subsidiaries.
- (c) Income before taxes divided by total revenue.

Note 23 - International operations

International activity includes Investment Management and Investment Services fee revenue generating businesses, foreign exchange trading activity, loans and other revenue producing assets and transactions in which the customer is domiciled outside of the United States and/or the international activity is resident at an international entity. Due to the nature of our international and domestic activities, it is not possible to precisely distinguish our international operations between internationally and

domestically domiciled customers. As a result, it is necessary to make certain subjective assumptions such as:

- Income from international operations is determined after internal allocations for interest revenue, taxes, expenses and provision for credit losses.
- Expense charges to international operations include those directly incurred in connection with such activities, as well as an allocable share of general support and overhead charges.

Total assets, total revenue, income before income taxes and net income of our international operations are shown in the table below.

International operations (in millions)	International			Total International	Total Domestic	Total
	EMEA	APAC	Other			
2017						
Total assets at period end (a)	\$ 88,490 (b)	\$ 20,676	\$ 1,737	\$ 110,903	\$ 260,855	\$ 371,758
Total revenue	3,982 (b)	997	610	5,589	9,954	15,543
Income before income taxes	1,497	538	296	2,331	2,279	4,610
Net income	1,186	426	234	1,846	2,268	4,114
2016						
Total assets at period end (a)	\$ 73,303 (b)	\$ 18,074	\$ 1,350	\$ 92,727	\$ 240,742	\$ 333,469
Total revenue	3,744 (b)	922	549	5,215	10,022	15,237
Income before income taxes	1,263	485	286	2,034	2,691	4,725
Net income	1,013	389	229	1,631	1,917	3,548
2015						
Total assets at period end (a)	\$ 76,679 (b)	\$ 17,829	\$ 1,176	\$ 95,684	\$ 298,096	\$ 393,780
Total revenue	3,932 (b)	904	577	5,413	9,781	15,194
Income before income taxes	1,436	451	269	2,156	2,079	4,235
Net income	1,163	365	218	1,746	1,476	3,222

(a) Total assets include long-lived assets, which are not considered by management to be significant in relation to total assets. Long-lived assets are primarily located in the United States.

(b) Includes revenue of approximately \$2.4 billion, \$2.2 billion and \$2.3 billion and assets of approximately \$32.9 billion, \$29.6 billion and \$33.2 billion in 2017, 2016 and 2015, respectively, of international operations domiciled in the UK, which is 15%, 14% and 15% of total revenue and 9%, 9% and 8% of total assets, respectively.

Note 24 - Supplemental information to the Consolidated Statement of Cash Flows

Non-cash investing and financing transactions that, appropriately, are not reflected in the Consolidated Statement of Cash Flows are listed below.

Non-cash investing and financing transactions (in millions)	Year ended Dec. 31,		
	2017	2016	2015
Transfers from loans to other assets for other real estate owned ("OREO")	\$ 3	\$ 4	\$ 7
Change in assets of consolidated VIEs	500	170	7,881
Change in liabilities of consolidated VIEs	313	69	7,423
Change in nonredeemable noncontrolling interests of consolidated investment management funds	302	120	295
Securities purchased not settled	112	75	—
Securities sales not settled	587	—	11
Securities matured not settled	70	—	—
Available-for-sale securities transferred to held-to-maturity	—	—	11,602
Held-to-maturity securities transferred to available-for-sale	74	10	—
Premises and equipment/capitalized software funded by capital lease obligations	347	13	49

To the Stockholders and Board of Directors
The Bank of New York Mellon Corporation:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of The Bank of New York Mellon Corporation and subsidiaries (BNY Mellon) as of December 31, 2017 and 2016, the related consolidated statements of income, comprehensive income, changes in equity, and cash flows for each of the years in the three-year period ended December 31, 2017, 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 BNY Mellon as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2017, 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), BNY Mellon's internal control over financial reporting as of December 31, 2017, 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 28, 2018 expressed an unqualified opinion on the effectiveness of BNY Mellon's internal control over financial reporting.

Basis of Opinion

These consolidated financial statements are the responsibility of BNY Mellon'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 BNY Mellon 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 regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as BNY Mellon's auditor since 2007.

New York, New York
February 28, 2018

Effective February 28, 2018

Directors

Linda Z. Cook

Managing Director and Member of the Executive Committee of EIG Global Energy Partners, an investment firm, and Chief Executive Officer of Harbour Energy, Ltd., an energy investment vehicle

Joseph J. Echevarria

Retired Chief Executive Officer
Deloitte LLP
Global provider of audit, consulting, financial advisory, risk management, tax and related services

Edward P. Garden

Chief Investment Officer and a founding partner, Triam Fund Management, L.P.
Alternative investment management firm

Jeffrey A. Goldstein

Chief Executive Officer,
SpringHarbor Financial Group LLC and a Senior Advisor, Hellman & Friedman LLC
Private equity firm

John M. Hinshaw

Former Executive Vice President and Chief Customer Officer at Hewlett Packard Enterprise Company
Global provider of IT, technology and enterprise products and solutions

Edmund F. (Ted) Kelly

Retired Chairman
Liberty Mutual Group
Multi-line insurance company

John A. Luke, Jr.

Non-Executive Chairman
WestRock Company
Global paper and packaging company

Jennifer B. Morgan

Executive Board Member of SAP and President of SAP Americas and Asia Pacific Japan, Global Customer Operations
Global software company

Mark A. Nordenberg

Chancellor Emeritus,
Chair of the Institute of Politics and Distinguished Service Professor of Law
University of Pittsburgh
Major public research university

Elizabeth E. Robinson

Former Global Treasurer, Partner and Managing Director of
The Goldman Sachs Group, Inc.
Global financial services company

Charles W. Scharf

Chairman and Chief Executive Officer
The Bank of New York Mellon Corporation

Samuel C. Scott III

Retired Chairman, President and Chief Executive Officer
Ingredion Incorporated (formerly Corn Products International, Inc.)
Global ingredient solutions provider

Executive Committee and Other Executive Officers

J. David Cruikshank

Chairman, Asia Pacific

Lisa Dolly

Chief Executive Officer, Pershing LLC

Bridget E. Engle *

Chief Information Officer

Thomas P. (Todd) Gibbons *

Chief Executive Officer, Clearing, Markets and Client Management

Mitchell E. Harris *

Chief Executive Officer, Investment Management

Monique R. Herena *

Chief Human Resources Officer

Hani A. Kablawi *

Chief Executive Officer, Global Asset Servicing and Chairman, Europe, Middle East and Africa

Kurtis R. Kurimsky *

Corporate Controller

Francis (Frank) La Salla *

Chief Executive Officer, Issuer Services

J. Kevin McCarthy *

General Counsel

Michelle M. Neal

Chief Executive Officer, BNY Mellon Markets

Brian Ruane

Chief Executive Officer, Government Securities Services Corp.

Michael P. Santomassimo *

Chief Financial Officer

Charles W. Scharf *

Chairman and Chief Executive Officer

Douglas H. Shulman *

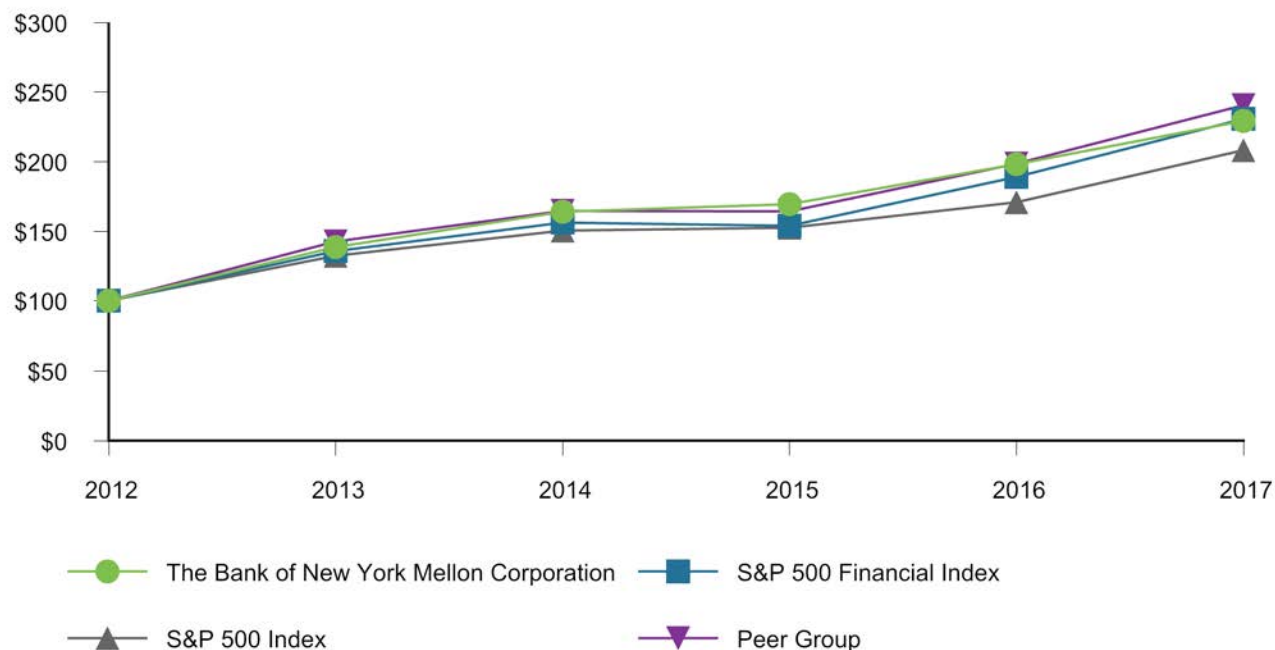
Head of Client Service Delivery

James S. Wiener *

Chief Risk Officer

* Designated as an Executive Officer.

Cumulative Total Shareholder Return (5 Years)



Cumulative shareholder returns (a) (in dollars)	Dec. 31,					
	2012	2013	2014	2015	2016	2017
The Bank of New York Mellon Corporation	\$ 100.0	\$ 138.7	\$ 164.0	\$ 169.4	\$ 198.3	\$ 229.4
S&P 500 Financial Index	100.0	135.6	156.3	153.9	188.9	230.9
S&P 500 Index	100.0	132.4	150.5	152.6	170.8	208.1
Peer Group	100.0	142.6	164.6	164.3	198.7	240.7

(a) Returns are weighted by market capitalization at the beginning of the measurement period.

This graph shows The Bank of New York Mellon Corporation’s cumulative total shareholder returns over the five-year period from Dec. 31, 2012 to Dec. 31, 2017. Our peer group is composed of financial services companies which provide investment management and investment servicing. We also utilize the S&P 500 Financial Index as a benchmark against our performance. The graph shows the cumulative total returns for the same five-year period of the S&P 500 Financial Index, the S&P 500 Index as well as our peer group listed below. The comparison assumes a \$100 investment on Dec. 31, 2012 in The Bank of New York Mellon Corporation common stock, in the S&P 500 Financial Index, in the S&P 500 Index and in the peer group detailed below and assumes that all dividends were reinvested.

Peer Group

BlackRock, Inc.	Morgan Stanley	State Street Corporation
The Charles Schwab Corporation	Northern Trust Corporation	U.S. Bancorp
Franklin Resources, Inc.	The PNC Financial Services Group, Inc.	Wells Fargo & Company
JPMorgan Chase & Co.	Prudential Financial, Inc.	