

Management's Discussion and Analysis

Management's Discussion and Analysis (MD&A) is provided to enable a reader to assess our results of operations and financial condition for the fiscal year ended October 31, 2017, compared to the preceding fiscal year. This MD&A should be read in conjunction with our 2017 Annual Consolidated Financial Statements and related notes and is dated November 28, 2017. All amounts are in Canadian dollars, unless otherwise specified, and are based on financial statements prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB), unless otherwise noted.

Additional information about us, including our 2017 Annual Information Form, is available free of charge on our website at rbc.com/investorrelations, on the Canadian Securities Administrators' website at sedar.com and on the EDGAR section of the United States (U.S.) Securities and Exchange Commission's (SEC) website at sec.gov. Information contained in or otherwise accessible through the websites mentioned does not form part of this report. All references in this report to websites are inactive textual references and are for your information only.

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Caution regarding forward-looking statements

From time to time, we make written or oral forward-looking statements within the meaning of certain securities laws, including the "safe harbour" provisions of the *United States Private Securities Litigation Reform Act of 1995* and any applicable Canadian securities legislation. We may make forward-looking statements in this 2017 Annual Report, in other filings with Canadian regulators or the SEC, in other reports to shareholders and in other communications. Forward-looking statements in this document include, but are not limited to, statements relating to our financial performance objectives, vision and strategic goals, the Economic, market, and regulatory review and outlook for Canadian, U.S., European and global economies, the regulatory environment in which we operate, the Strategic priorities and Outlook sections for each of our business segments, and the risk environment including our liquidity and funding risk, and includes our President and Chief Executive Officer's statements. The forward-looking information contained in this document is presented for the purpose of assisting the holders of our securities and financial analysts in understanding our financial position and results of operations as at and for the periods ended on the dates presented, as well as our financial performance objectives, vision and strategic goals, and may not be appropriate for other purposes. Forward-looking statements are typically identified by words such as "believe", "expect", "foresee", "forecast", "anticipate", "intend", "estimate", "goal", "plan" and "project" and similar expressions of future or conditional verbs such as "will", "may", "should", "could" or "would".

By their very nature, forward-looking statements require us to make assumptions and are subject to inherent risks and uncertainties, which give rise to the possibility that our predictions, forecasts, projections, expectations or conclusions will not prove to be accurate, that our assumptions may not be correct and that our financial performance objectives, vision and strategic goals will not be achieved. We caution readers not to place undue reliance on these statements as a number of risk factors could cause our actual results to differ materially from the expectations expressed in such forward-looking statements. These factors – many of which are beyond our control and the effects of which can be difficult to predict – include: credit, market, liquidity and funding, insurance, operational, regulatory compliance, strategic, reputation, legal and regulatory environment, competitive and systemic risks and other risks discussed in the risks sections of our 2017 Annual Report; including global uncertainty and volatility, elevated Canadian housing prices and household indebtedness, information technology and cyber risk, regulatory change, technological innovation and new entrants, global environmental policy and climate change, changes in consumer behaviour, the end of quantitative easing, the business and economic conditions in the geographic regions in which we operate, the effects of changes in government fiscal, monetary and other policies, tax risk and transparency and environmental and social risk.

We caution that the foregoing list of risk factors is not exhaustive and other factors could also adversely affect our results. When relying on our forward-looking statements to make decisions with respect to us, investors and others should carefully consider the foregoing factors and other uncertainties and potential events. Material economic assumptions underlying the forward-looking statements contained in this 2017 Annual Report are set out in the Economic, market, and regulatory review and outlook section and for each business segment under the Strategic priorities and Outlook headings. Except as required by law, we do not undertake to update any forward-looking statement, whether written or oral, that may be made from time to time by us or on our behalf.

Additional information about these and other factors can be found in the risks sections of our 2017 Annual Report.

Selected financial and other highlights

Table 1

(Millions of Canadian dollars, except per share, number of and percentage amounts)	2017	2016	2017 vs. 2016 Increase (decrease)	
Total revenue (1)	\$ 40,669	\$ 38,795	\$ 1,874	4.8%
Provision for credit losses (PCL)	1,150	1,546	(396)	(25.6)%
Insurance policyholder benefits, claims and acquisition expense (PBCAE)	3,053	3,424	(371)	(10.8)%
Non-interest expense (1)	21,794	20,526	1,268	6.2%
Income before income taxes	14,672	13,299	1,373	10.3%
Net income	\$ 11,469	\$ 10,458	\$ 1,011	9.7%
Segments – net income				
Personal & Commercial Banking	\$ 5,755	\$ 5,184	\$ 571	11.0%
Wealth Management	1,838	1,473	365	24.8%
Insurance	726	900	(174)	(19.3)%
Investor & Treasury Services	741	613	128	20.9%
Capital Markets	2,525	2,270	255	11.2%
Corporate Support	(116)	18	(134)	(744.4)%
Net income	\$ 11,469	\$ 10,458	\$ 1,011	9.7%
Selected information				
Earnings per share (EPS) – basic	\$ 7.59	\$ 6.80	\$ 0.79	11.6%
– diluted	7.56	6.78	0.78	11.5%
Return on common equity (ROE) (2), (3)	17.0%	16.3%	n.m.	70 bps
Average common equity (2)	\$ 65,300	\$ 62,200	\$ 3,100	5.0%
Net interest margin (NIM) – on average earning assets (2)	1.72%	1.70%	n.m.	2 bps
Total PCL as a % of average net loans and acceptances (2)	0.21%	0.29%	n.m.	(8) bps
PCL on impaired loans as a % of average net loans and acceptances (2)	0.21%	0.28%	n.m.	(7) bps
Gross impaired loans (GIL) as a % of loans and acceptances (4)	0.46%	0.73%	n.m.	(27) bps
Liquidity coverage ratio (LCR) (5)	122%	127%	n.m.	(500) bps
Capital ratios and Leverage ratio (6)				
Common Equity Tier 1 (CET1) ratio	10.9%	10.8%	n.m.	10 bps
Tier 1 capital ratio	12.3%	12.3%	n.m.	– bps
Total capital ratio	14.2%	14.4%	n.m.	(20) bps
Leverage ratio	4.4%	4.4%	n.m.	– bps
Selected balance sheet and other information (7)				
Total assets	\$ 1,212,853	\$ 1,180,258	\$ 32,595	2.8%
Securities	218,379	236,093	(17,714)	(7.5)%
Loans (net of allowance for loan losses)	542,617	521,604	21,013	4.0%
Derivative related assets	95,023	118,944	(23,921)	(20.1)%
Deposits	789,635	757,589	32,046	4.2%
Common equity	67,416	64,304	3,112	4.8%
Total capital risk-weighted assets	474,478	449,712	24,766	5.5%
Assets under management (AUM)	639,900	586,300	53,600	9.1%
Assets under administration (AUA) (8)	5,473,300	5,058,900	414,400	8.2%
Common share information				
Shares outstanding (000s) – average basic	1,466,988	1,485,876	(18,888)	(1.3)%
– average diluted	1,474,421	1,494,137	(19,716)	(1.3)%
– end of period	1,452,898	1,485,394	(32,496)	(2.2)%
Dividends declared per common share	\$ 3.48	\$ 3.24	\$ 0.24	7.4%
Dividend yield (9)	3.8%	4.3%	n.m.	(50) bps
Common share price (RY on TSX) (10)	\$ 100.87	\$ 83.80	\$ 17.07	20.4%
Market capitalization (TSX) (10)	146,554	124,476	22,078	17.7%
Business information (number of)				
Employees (full-time equivalent) (FTE) (11)	78,210	77,825	385	0.5%
Bank branches	1,376	1,419	(43)	(3.0)%
Automated teller machines (ATMs)	4,630	4,905	(275)	(5.6)%
Period average US\$ equivalent of C\$1.00 (12)	\$ 0.765	\$ 0.755	\$ 0.010	1.3%
Period-end US\$ equivalent of C\$1.00	\$ 0.775	\$ 0.746	\$ 0.029	3.9%

- (1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.
- (2) Average amounts are calculated using methods intended to approximate the average of the daily balances for the period. This includes Average common equity used in the calculation of ROE. For further details, refer to the Key performance and non-GAAP measures section.
- (3) These measures may not have a standardized meaning under generally accepted accounting principles (GAAP) and may not be comparable to similar measures disclosed by other financial institutions. For further details, refer to the Key performance and non-GAAP measures section.
- (4) GIL includes \$256 million (2016 – \$418 million) related to the acquired credit-impaired (ACI) loans portfolio from our acquisition of City National Corporation (City National). ACI loans added 5 bps to our 2017 GIL ratio (2016 – 8 bps). For further details, refer to Note 2 and 5 of our 2017 Annual Consolidated Financial Statements.
- (5) LCR is calculated using the Basel III Liquidity Adequacy Requirements (LAR) guideline. Effective the first quarter of 2017, the Office of the Superintendent of Financial Institutions (OSFI) requires the LCR to be disclosed based on the average of the daily positions during the quarter. For further details, refer to the Liquidity and funding risk section.
- (6) Capital and Leverage ratios presented above are on an "all-in" basis. The Leverage ratio is a regulatory measure under the Basel III framework. For further details, refer to the Capital management section.
- (7) Represents period-end spot balances.
- (8) AUA includes \$18.4 billion and \$8.4 billion (2016 – \$18.6 billion and \$9.6 billion) of securitized residential mortgages and credit card loans, respectively.
- (9) Defined as dividends per common share divided by the average of the high and low share price in the relevant period.
- (10) Based on TSX closing market price at period-end.
- (11) Amounts have been revised from those previously reported.
- (12) Average amounts are calculated using month-end spot rates for the period.
- n.m. not meaningful

About Royal Bank of Canada

Royal Bank of Canada is a global financial institution with a purpose-driven, principles-led approach to delivering leading performance. Our success comes from the 80,000+ employees who bring our vision, values and strategy to life so we can help our clients thrive and communities prosper. As Canada's biggest bank, and one of the largest in the world based on market capitalization, we have a diversified business model with a focus on innovation and providing exceptional experiences to our 16 million clients in Canada, the U.S. and 35 other countries. Learn more at rbc.com.

Our business segments are described below.

Personal & Commercial Banking operates in Canada, the Caribbean and the U.S., and comprises our personal and business banking operations, as well as our auto financing and retail investment businesses.

Wealth Management serves high net worth (HNW) and ultra-high net worth clients (UHNW) from our offices in key financial centres mainly in Canada, the U.S., the U.K., the Channel Islands and Asia with a comprehensive suite of investment, trust, banking, credit and other wealth management solutions. We also provide asset management products and services directly to institutional and individual clients through our distribution channels and third-party distributors.

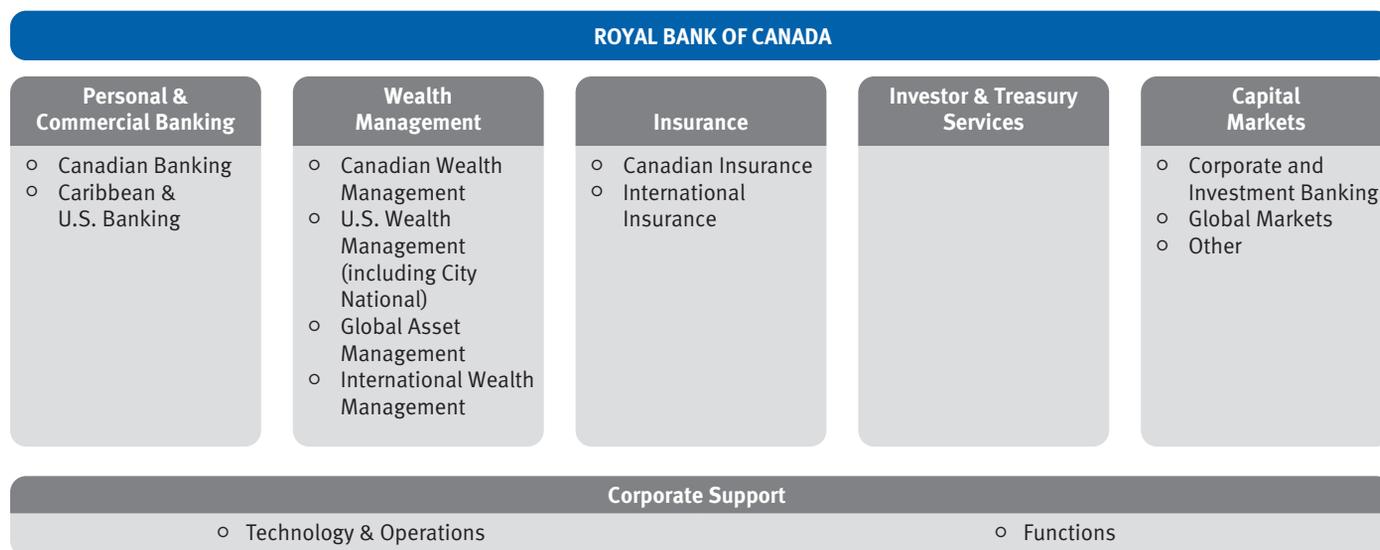
Insurance provides a wide range of life, health, home, auto, travel, wealth, group and reinsurance products and solutions. In Canada, we offer insurance products and services through our proprietary distribution channels, comprised of the field sales force which includes retail insurance branches, our field sales representatives, advice centres and online, as well as through independent insurance advisors and affinity relationships. Outside Canada, we operate in reinsurance markets globally offering life, accident and annuity reinsurance products.

Investor & Treasury Services serves the needs of institutional investing clients by providing asset services, custodial, advisory, financing and other services to safeguard assets, maximize liquidity and manage risk in multiple jurisdictions around the world. We also provide short-term funding and liquidity management for RBC.

Capital Markets provides public and private companies, institutional investors, governments and central banks with a wide range of products and services. In North America, we offer a full suite of products and services which include corporate and investment banking, equity and debt origination and distribution, and structuring and trading. Outside North America, we offer a diversified set of capabilities in our key sectors of expertise such as energy, mining and infrastructure, and we have expanded into industrial, consumer and healthcare in Europe.

Our business segments are supported by Corporate Support, which consists of Technology & Operations and Functions. Technology & Operations provides the technological and operational foundation required to effectively deliver products and services to our clients, while Functions includes our finance, human resources, risk management, internal audit and other functional groups.

The following chart presents our business segments and respective lines of business:



Vision and strategic goals

Our business strategies and actions are guided by our vision, **"To be among the world's most trusted and successful financial institutions."** Our three strategic goals are:

- In Canada, to be the undisputed leader in financial services;
- In the U.S., to be the preferred partner to corporate, institutional and high net worth clients and their businesses; and
- In select global financial centres, to be a leading financial services partner valued for our expertise.

For our progress in 2017 against our business strategies and strategic goals, refer to the Business segment results section.

The predictions and forecasts in this section are based on information and assumptions from sources we consider reliable. If this information or these assumptions are not accurate, actual economic outcomes may differ materially from the outlook presented in this section. For details on risk factors from general business and economic conditions that may affect our business and financial results, refer to the Macroeconomic risk drivers and Overview of other risks sections.

Canada

The Canadian economy is expected to grow by 3.0% during calendar 2017, which is above both our estimates of 1.8% as at November 29, 2016 and 2.9% as at August 22, 2017. Growth has been broad-based across regions and sectors. In particular, strong growth earlier this year reflected a robust increase in consumer spending amid strong employment growth, low interest rates, and wealth accumulation from rising home prices. Business investment has also improved alongside growing corporate profits and improving business sentiment. The unemployment rate of 6.3% in October is down from 7.0% a year ago and indicates the labour market is close to full employment. Growth is expected to slow to a more moderate rate towards the end of 2017 as the economy nears capacity limits and consumer spending returns to a more sustainable trend. The housing sector is expected to slow as rising interest rates and recent policy changes weigh on activity. Business investment is expected to continue rising although uncertainty surrounding U.S. trade policy could impact business sentiment. With strong growth over the first half of the year pushing the Canadian economy close to full capacity, the Bank of Canada (BoC) raised rates, once in July and again in September. The overnight rate was then left unchanged at 1.00% in October 2017.

In calendar 2018, we expect the Canadian economy will grow at a rate of 2.1% as stronger business investment, exports and government spending offset slower consumer spending growth and further moderation in the housing sector. Uncertainty relating to NAFTA negotiations remains a downside risk to the outlook for exports and business investment. That risk, along with uncertainty about how highly-indebted households will respond to higher interest rates, is keeping the BoC cautious in raising interest rates. We expect a pause in the current tightening cycle until the second calendar quarter of 2018.

U.S.

The U.S. economy is expected to grow by 2.2% in calendar 2017, which is consistent with our estimate as at November 29, 2016 and slightly above our estimate of 2.1% as at August 22, 2017. Growth this year has been supported by consumer spending, reflecting a strong labour market and elevated consumer confidence, as well as rising business investment. Economic activity remained strong in the third calendar quarter of 2017 despite a negative impact from severe weather conditions. The labour market is close to full capacity with October's unemployment rate of 4.1% well below the Federal Reserve's (Fed) longer run estimate of 4.6%. Inflation remains below the Fed's 2% target but is expected to increase over the medium term amid tight economic conditions. We expect the Fed will raise the federal funds target range by 25 basis points to 1.25% to 1.50% in December 2017.

In calendar 2018, we expect the U.S. economy will grow at a rate of 2.5%, largely reflecting continued strength in consumer spending amid a solid job market and elevated consumer confidence. Business investment is also expected to continue rising as a result of strong business confidence, accommodative fiscal policies and stronger global growth support investment. The release of the Tax Reform Framework by the U.S. administration in the fourth quarter of 2017, including corporate tax reform, if or when enacted, could have significant implications for both corporations and individuals. As inflation reaches its target, we expect the Fed will continue with steady, gradual rate hikes next year.

Europe

The Eurozone economy is expected to grow by 2.3% in calendar 2017, which is well above our estimate of 1.3% as at November 29, 2016 and above our estimate of 2.0% as at August 22, 2017. Despite a politically unstable environment, including the Catalanian referendum, Brexit negotiations, and the success of populist parties seen in recent elections, the Eurozone has experienced positive growth. Improving labour market conditions, stronger business and consumer confidence, and accommodative financial conditions have supported a broad-based recovery. The unemployment rate of 8.9% in September was the lowest since January 2009. In October, the European Central Bank (ECB) announced its asset purchase program would be extended at least through September 2018, although with net monthly purchases being reduced beginning in January 2018.

In calendar 2018, we expect the Eurozone economy will grow at a rate of 1.9%. Growth will continue to be driven by improving labour market conditions, accommodative monetary policy and a stronger global backdrop. However, with inflationary pressure and wage growth remaining muted, we expect the ECB will hold its deposit rate at -0.4% throughout 2018 and maintain asset purchases as planned.

Financial markets

A strengthening global economic outlook has contributed to equity markets rising to record highs. Some central banks have begun scaling back accommodation but monetary policy remains stimulative. Government bond yields have increased modestly as markets anticipate further monetary policy tightening will be gradual. Geopolitical and trade risks remain a source of uncertainty and have the potential to weigh on global markets.

The macroeconomic headwinds discussed above, such as the potential for greater uncertainty or financial market volatility related to proposed policies by the U.S. administration, including the Tax Reform Framework and NAFTA negotiations, Brexit, high household indebtedness, and possible further cuts by the BoC and the Fed to their respective stimulus measures may alter our outlook and results for fiscal 2018 and future periods as these continuing pressures may lead to higher PCL in our wholesale and retail loan portfolios, slower volume growth, and impact the general business and economic conditions in the regions we operate.

Regulatory environment

We continue to monitor and prepare for regulatory developments in a manner that seeks to ensure compliance with new requirements while mitigating any adverse business or economic impacts. Such impacts could result from new or amended regulations and the expectations of those who enforce them. Significant developments include continuing changes to global and domestic standards for capital and liquidity, changes to federal mortgage rules, over-the-counter (OTC) derivatives reform, and initiatives to enhance requirements for institutions deemed systemically important to the financial sector. We also continue to monitor changes to resolution regimes addressing government bail-in and total loss-absorbing capacity.

For a discussion on risk factors resulting from these and other regulatory developments which may affect our business and financial results, refer to the Risk management section. For further details on our framework and activities to manage risks, refer to the Risk management and Capital management sections.

Defining and measuring success through total shareholder returns

Our focus is to maximize total shareholder returns (TSR) through the achievement of top half performance compared to our global peer group over the medium-term (3-5 years), which we believe reflects a longer-term view of strong and consistent financial performance.

Maximizing TSR is aligned with our three strategic goals discussed earlier and we believe represents the most appropriate measure of shareholder value creation. TSR is a concept used to compare the performance of our common shares over a period of time, reflecting share price appreciation and dividends paid to common shareholders. The absolute size of TSR will vary depending on market conditions, and the relative position reflects the market's perception over a period of time of our overall performance relative to our peers.

Financial performance objectives are used to measure progress against our medium-term TSR objectives. We review and revise these financial performance objectives as economic, market and regulatory environments change. By focusing on our medium-term objectives in our decision-making, we believe we will be well-positioned to provide sustainable earnings growth and solid returns to our common shareholders.

The following table provides a summary of our 2017 performance against our medium-term financial performance objectives:

2017 Financial performance compared to our medium-term objectives

Table 2

	2017 results
Diluted EPS growth of 7% +	11.5%
ROE of 16% +	17.0%
Strong capital ratios (CET1) ⁽¹⁾	10.9%
Dividend payout ratio 40% – 50%	46%

(1) For further details on the CET1 ratio, refer to the Capital management section.

For 2018, our medium-term financial performance objectives will remain unchanged.

We compare our TSR to that of a global peer group approved by our Board of Directors. The global peer group remains unchanged from last year and consists of the following 10 financial institutions:

- **Canadian financial institutions:** Bank of Montreal, Canadian Imperial Bank of Commerce, Manulife Financial Corporation, National Bank of Canada, Power Financial Corporation, The Bank of Nova Scotia, and Toronto-Dominion Bank.
- **U.S. banks:** JPMorgan Chase & Co. and Wells Fargo & Company.
- **International banks:** Westpac Banking Corporation.

Medium-term objectives – three and five year TSR vs. peer group average

Table 3

	Three year TSR ⁽¹⁾	Five year TSR ⁽¹⁾
Royal Bank of Canada	12% Top half	17% Top half
Peer group average (excluding RBC)	10%	15%

(1) The three and the five year annualized TSR are calculated based on our common share price appreciation as per the TSX closing market price plus reinvested dividends for the period October 31, 2014 to October 31, 2017 and October 31, 2012 to October 31, 2017, respectively.

Common share and dividend information

Table 4

For the year ended October 31	2017	2016	2015	2014	2013
Common share price (RY on TSX) – close, end of period	\$ 100.87	\$ 83.80	\$ 74.77	\$ 80.01	\$ 70.02
Dividends paid per share	3.40	3.20	3.04	2.76	2.46
Increase (decrease) in share price	20.4%	12.1%	(6.5)%	14.3%	23.0%
Total shareholder return	25.0%	16.8%	(3.0)%	19.0%	28.0%

Key corporate events of 2017

Sale of certain Caribbean Wealth Management businesses

On May 12, 2017, we completed the previously announced sale of our trust, custody and fund administration businesses in the Caribbean to SMP Partners Group. The transaction did not have a significant impact on our financial statements. For further details, refer to Note 11 of our Annual Consolidated Financial Statements.

Sale of U.S. operations of Moneris Solutions Corporation

On November 10, 2016, our payment processing joint venture with Bank of Montreal, Moneris Solutions Corporation (Moneris), signed a Purchase and Sale agreement to sell its U.S. operations to Vantiv, Inc. The transaction closed on December 21, 2016. As a result, we recorded our share of the gain which was \$212 million (before- and after-tax) in Non-interest income – Share of profit in joint ventures and associates. For further details, refer to Note 12 of our Annual Consolidated Financial Statements.

2017 vs. 2016

Net income of \$11,469 million was up \$1,011 million or 10% from a year ago. Diluted earnings per share (EPS) of \$7.56 was up \$0.78 or 12% and return on common equity (ROE) of 17.0% was up 70 bps from 16.3% last year. Our Common Equity Tier 1 (CET1) ratio was 10.9%, up 10 bps from a year ago.

Our results reflected strong earnings in Personal & Commercial Banking, Capital Markets, Wealth Management and Investor & Treasury Services, partially offset by lower earnings in Insurance. Our results include our share of the gain related to the sale of the U.S. operations of Moneris in 2017. Our results in 2016 included the gain on sale of our home and auto insurance manufacturing business.

Personal & Commercial Banking results were higher mainly reflecting volume growth of 6%, and our share of the gain related to the sale of the U.S. operations of Moneris in the current year. Higher fee-based revenue in Canada and lower PCL also contributed to the increase. These factors were partially offset by higher costs in support of business growth reflecting ongoing investments in technology, including digital initiatives and higher marketing costs.

Capital Markets results were up largely driven by higher results in Corporate and Investment Banking and Global Markets reflecting increased fee-based revenue, lower PCL and a lower effective tax rate due to changes in earnings mix. These factors were partially offset by higher costs related to changes in the timing of deferred compensation, increased variable compensation on improved results and the impact of foreign exchange translation.

Wealth Management earnings increased mainly due to growth in average fee-based client assets, higher net interest income and increased transaction revenue. These factors were partially offset by higher variable compensation on improved results and increased costs in support of business growth, mainly reflecting higher staff-related costs in the U.S. and ongoing investments in technology, including digital initiatives.

Investor & Treasury Services results increased primarily due to higher earnings across all major businesses driven by funding and liquidity and increased results from our asset services business. These factors were partially offset by higher investment in technology initiatives.

Insurance results decreased primarily due to the gain on sale as noted above, which was a specified item in the prior year and is described further below. Excluding the gain on sale, Insurance earnings were up mainly due to higher favourable annual actuarial assumption updates largely reflecting changes in credit and discount rates and favourable mortality experience, mainly in the U.K. These factors were partially offset by lower earnings from new U.K. annuity contracts and reduced earnings associated with the sale of our home and auto insurance manufacturing business, which was sold on July 1, 2016.

Corporate Support net loss was \$116 million in the current year, largely reflecting severance and related charges, net unfavourable tax adjustments and legal costs, partially offset by asset/liability management activities. Corporate Support net income was \$18 million in the prior year, largely reflecting asset/liability management activities, partially offset by net unfavourable tax adjustments and a \$50 million (\$37 million after-tax) increase in the provision for loans not yet identified as impaired.

For further details on our business segment results and CET1 ratio, refer to the Business segment results and Capital management sections, respectively.

Results excluding specified items are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Impact of foreign currency translation

The following table reflects the estimated impact of foreign currency translation on key income statement items:

(Millions of Canadian dollars, except per share amounts)	2017 vs. 2016	
<i>Increase (decrease):</i>		
Total revenue	\$	(360)
PCL		(3)
PBCAE		–
Non-interest expense		(270)
Income taxes		(15)
Net income		(72)
Impact on EPS		
Basic	\$	(0.05)
Diluted		(0.05)

The relevant average exchange rates that impact our business are shown in the following table:

(Average foreign currency equivalent of C\$1.00) (1)	2017	2016
U.S. dollar	0.765	0.755
British pound	0.596	0.544
Euro	0.686	0.683

(1) Average amounts are calculated using month-end spot rates for the period.

Table 7

(Millions of Canadian dollars)	2017	2016
Interest income	\$ 26,904	\$ 24,452
Interest expense	9,764	7,921
Net interest income	\$ 17,140	\$ 16,531
NIM	1.72%	1.70%
Investments (1), (2)	\$ 9,558	\$ 8,946
Insurance (3)	4,566	4,868
Trading	806	701
Banking (4)	5,110	4,848
Underwriting and other advisory	2,093	1,876
Other (5)	1,396	1,025
Non-interest income (1)	\$ 23,529	\$ 22,264
Total revenue (1)	\$ 40,669	\$ 38,795

- (1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.
- (2) Includes securities brokerage commissions, investment management and custodial fees, and mutual fund revenue.
- (3) Includes premiums and investment and fee income. Investment income includes the change in fair value of investments backing policyholder liabilities, which is largely offset in PBCAE.
- (4) Includes service charges, foreign exchange revenue other than trading, card service revenue and credit fees.
- (5) Includes other non-interest income, net gain (loss) on available-for-sale (AFS) securities and share of profit in joint ventures and associates.

2017 vs. 2016

Total revenue increased \$1,874 million or 5% from last year, mainly due to higher investment revenue and higher net interest income. Higher banking and underwriting revenue, as well as our share of the gain related to the sale of the U.S. operations of Moneris in the current year also contributed to the increase. These factors were partially offset by lower insurance revenue and the gain from the sale of our home and auto insurance manufacturing business in the prior year. The impact of foreign exchange translation also decreased our total revenue by \$360 million.

Net interest income increased \$609 million or 4%, mainly due to volume growth in both Canadian Banking and Wealth Management, and the impact of higher U.S. interest rates. These factors were partially offset by lower spreads in Canadian Banking.

NIM was up 2 bps compared to last year largely due to the impact of higher U.S. interest rates.

Investments revenue increased \$612 million or 7%, mainly due to growth in average fee-based client assets, which benefitted from capital appreciation and net sales in Wealth Management, and higher balances driving higher mutual fund distribution fees in Canadian Banking.

Insurance revenue decreased \$302 million or 6%, mainly reflecting the change in fair value of investments backing our policyholder liabilities, which was largely offset in PBCAE, as well as lower premiums reflecting the impact of the sale of our home and auto insurance manufacturing business in the prior year. These factors were partially offset by higher revenues from group annuity sales in Canadian Insurance, and the impact of restructured international life contracts, both of which are largely offset in PBCAE.

Banking revenue increased \$262 million or 5%, primarily due to increased loan syndication activity mainly in the U.S. and Canada, and higher card service revenue.

Underwriting and other advisory revenue increased \$217 million or 12%, primarily reflecting increased debt origination activity mainly in the U.S. and Canada. Higher mergers and acquisitions (M&A) activity, largely in the U.S. and Europe also contributed to the increase.

Other revenue increased \$371 million from last year largely reflecting the change in fair value of our U.S. share-based compensation plan, which is largely offset in non-interest expense, and a gain from the disposition of certain securities. Our results also include our share of the gain from the sale of the U.S. operations of Moneris in the current year which was more than offset by the gain from the sale of our home and auto insurance manufacturing business in the prior year.

Additional trading information

Table 8		
(Millions of Canadian dollars)	2017	2016
Total trading revenue (1)		
Net interest income	\$ 2,370	\$ 2,376
Non-interest income	806	701
Total trading revenue	\$ 3,176	\$ 3,077
Total trading revenue by product		
Interest rate and credit (2)	\$ 1,796	\$ 1,830
Equities	895	684
Foreign exchange and commodities (2)	485	563
Total trading revenue	\$ 3,176	\$ 3,077
Trading revenue (teb) by product		
Interest rate and credit (2)	\$ 1,796	\$ 1,830
Equities	1,221	1,166
Foreign exchange and commodities (2)	485	564
Total trading revenue (teb)	\$ 3,502	\$ 3,560
Trading revenue (teb) by product – Capital Markets		
Interest rate and credit	\$ 1,466	\$ 1,473
Equities	1,251	1,205
Foreign exchange and commodities	331	402
Total Capital Markets trading revenue (teb)	\$ 3,048	\$ 3,080

(1) Includes a gain of \$170 million (2016 – \$49 million gain) related to a funding valuation adjustment on uncollateralized OTC derivatives.

(2) Amounts have been revised from previously reported.

2017 vs. 2016

Total trading revenue of \$3,176 million, which comprises trading-related revenue recorded in Net interest income and Non-interest income, was up \$99 million, or 3%, mainly due to higher equity trading revenue in Europe and Asia & other international, partially offset by lower fixed income trading revenue mainly in the U.S., and lower foreign exchange trading revenue across all regions.

Provision for credit losses (PCL)

2017 vs. 2016

Total PCL of \$1,150 million decreased \$396 million or 26% from a year ago, mainly due to lower PCL in Capital Markets, Personal & Commercial Banking, and Wealth Management. The total PCL ratio of 21 bps improved 8 bps.

For further details on PCL, refer to Credit quality performance in the Credit Risk section.

Insurance policyholder benefits, claims and acquisition expense (PBCAE)

2017 vs. 2016

PBCAE of \$3,053 million decreased \$371 million or 11% from the prior year, mainly due to a change in the fair value of investments backing our policyholder liabilities, largely offset in revenue. Lower claims reflecting the impact from the sale of our home and auto insurance manufacturing business in the prior year and higher favourable annual actuarial assumption updates largely reflecting changes in credit and discount rates and favourable mortality experience, mainly in the U.K., also contributed to the decrease. These factors were partially offset by the impact from group annuity sales and restructured international life contracts, both of which are largely offset in revenue.

Non-interest expense

Table 9

(Millions of Canadian dollars, except percentage amounts) (1)	2017	2016
Salaries	\$ 5,936	\$ 5,865
Variable compensation	5,203	4,583
Benefits and retention compensation	1,792	1,674
Share-based compensation	399	255
Human resources	\$ 13,330	\$ 12,377
Equipment	1,434	1,438
Occupancy	1,588	1,568
Communications	1,011	945
Professional fees	1,214	1,078
Amortization of other intangibles	1,015	970
Other	2,202	2,150
Non-interest expense	\$ 21,794	\$ 20,526
Efficiency ratio (2)	53.6%	52.9%
Efficiency ratio adjusted (3)	53.5%	53.8%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(2) Efficiency ratio is calculated as non-interest expense divided by total revenue.

(3) Measures have been adjusted by excluding the change in fair value of investments backing our policyholder liabilities. These are non-GAAP measures. For further details, refer to the Key performance and non-GAAP measures section.

2017 vs. 2016

Non-interest expense increased \$1,268 million or 6%, largely due to increased staff-related costs including severance, and higher costs in support of business growth reflecting ongoing investments in technology, including digital initiatives, and increased marketing costs. The change in fair value of our U.S. share-based compensation plan, which is largely offset in revenue, also contributed to the increase. These factors were partially offset by the impact of foreign exchange translation and continued benefits from our efficiency management activities.

Our efficiency ratio of 53.6% increased 70 bps from 52.9% last year. Excluding the change in fair value of investments backing our policyholder liabilities, our efficiency ratio of 53.5% decreased 30 bps from last year mainly driven by the impact of foreign exchange translation and continued benefits from our efficiency management activities. These factors were partially offset by increased staff-related costs including severance and higher costs in support of business growth as noted above.

Efficiency ratio excluding the change in fair value of investments backing our policyholder liabilities is a non-GAAP measure. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Income and other taxes

Table 10

(Millions of Canadian dollars, except percentage amounts)	2017	2016
Income taxes	\$ 3,203	\$ 2,841
Other taxes		
Goods and services sales taxes	\$ 446	\$ 442
Payroll taxes	643	627
Capital taxes	88	106
Property taxes	140	134
Insurance premium taxes	30	45
Business taxes	46	69
	\$ 1,393	\$ 1,423
Total income and other taxes	\$ 4,596	\$ 4,264
Income before income taxes	\$ 14,672	\$ 13,299
Canadian statutory income tax rate (1)	26.5%	26.5%
Lower average tax rate applicable to subsidiaries	(3.5)%	(2.6)%
Tax-exempt income from securities	(2.0)%	(3.1)%
Tax rate change	(0.1)%	–%
Effect of previously unrecognized tax loss, tax credit or temporary differences	–%	(0.4)%
Other	0.9%	1.0%
Effective income tax rate	21.8%	21.4%
Effective total tax rate (2)	28.6%	29.0%

(1) Blended Federal and Provincial statutory income tax rate.

(2) Total income and other taxes as a percentage of income before income taxes and other taxes.

2017 vs. 2016

Income tax expense increased \$362 million or 13% from last year, mainly due to higher Income before income taxes. The effective tax rate of 21.8% increased 40 bps, mainly due to lower tax-exempt income and the impact from the gain on sale of our home and auto insurance manufacturing business of \$287 million (\$235 million after-tax) in 2016. These factors were partially offset by our share of a gain related to the sale of our U.S. operations of Moneris of \$212 million (before- and after-tax) in the current year.

Other taxes decreased \$30 million or 2% from 2016, mainly due to lower business taxes, capital taxes and insurance premiums, partially offset by an increase in payroll taxes. In addition to the income and other taxes reported in our Consolidated Statement of Income, we recorded income taxes of \$469 million (2016: recovery of \$438 million) in our Consolidated Statement of Comprehensive Income, primarily reflecting the remeasurement of employee benefit plans, net gains on derivatives designated as cash flow hedges, and net foreign currency translation gains from hedging activities.

Client assets

Assets under administration

Assets under administration (AUA) are assets administered by us which are beneficially owned by our clients. We provide services that are administrative in nature, including safekeeping, collecting investment income, settling purchase and sale transactions, and record keeping. Underlying investment strategies within AUA are determined by our clients and generally do not impact the administrative fees that we receive. Administrative fees can be impacted by factors such as asset valuation level changes from market movements, types of services administered, transaction volumes, geography and client relationship pricing based on volumes or multiple services.

Our Investor & Treasury Services business is the primary business segment that has AUA with approximately 78% of total AUA, as at October 31, 2017, followed by our Wealth Management and Personal & Commercial Banking businesses with approximately 17% and 5% of total AUA, respectively.

2017 vs. 2016

AUA increased \$414 billion or 8% compared to last year, mainly reflecting capital appreciation.

The following table summarizes AUA by geography and asset class:

AUA by geographic mix and asset class		Table 11	
(Millions of Canadian dollars)	2017	2016	
Canada ⁽¹⁾			
Money market	\$ 33,100	\$	33,000
Fixed income	730,100		731,200
Equity	765,800		705,900
Multi-asset and other	774,900		733,800
Total Canada	\$ 2,303,900	\$	2,203,900
U.S. ⁽¹⁾			
Money market	\$ 35,400	\$	36,400
Fixed income	124,500		126,800
Equity	238,100		200,800
Multi-asset and other	57,500		44,800
Total U.S.	\$ 455,500	\$	408,800
Other International ⁽¹⁾			
Money market	\$ 43,300	\$	50,300
Fixed income	387,500		426,200
Equity ⁽²⁾	867,600		836,300
Multi-asset and other ⁽²⁾	1,415,500		1,133,400
Total International	\$ 2,713,900	\$	2,446,200
Total AUA	\$ 5,473,300	\$	5,058,900

(1) Geographic information is based on the location from where our clients are serviced.

(2) Amounts have been revised from those previously presented.

Assets under management

Assets under management (AUM) are assets managed by us which are beneficially owned by our clients. Management fees are paid by the investment funds for the investment capabilities of an investment manager and can also cover administrative services. Management fees may be calculated daily, monthly or quarterly as a percentage of the AUM, depending on the distribution channel, product and investment strategies. In general, equity strategies carry a higher fee rate than fixed income or money market strategies. Fees are also impacted by asset mix and relationship pricing for clients using multiple services. Higher risk assets generally produce higher fees, while clients using multiple services can take advantage of synergies which reduce the fees they are charged. Certain funds may have performance fee arrangements. Performance fees are recorded when certain benchmarks or performance targets are achieved. These factors could lead to differences on fees earned by products and therefore net return by asset class may vary despite similar average AUM. Our Wealth Management segment is the primary business segment with approximately 99% of total AUM.

2017 vs. 2016

AUM increased \$54 billion or 9% compared to last year, primarily due to capital appreciation and net sales, partially offset by the impact of foreign exchange translation.

The following table presents the change in AUM for the year ended October 31, 2017:

Client assets – AUM							Table 12
	2017					2016	
	Money market	Fixed income	Equity	Multi-asset and other	Total	Total	
(Millions of Canadian dollars)							
AUM, beginning balance	\$ 47,900	\$ 198,700	\$ 100,800	\$ 238,900	\$ 586,300	\$ 498,400	
Institutional inflows	27,200	31,500	6,600	4,000	69,300	55,200	
Institutional outflows	(37,900)	(32,800)	(4,800)	(2,300)	(77,800)	(72,100)	
Personal flows, net	800	2,100	10,300	18,400	31,600	21,600	
Total net flows	(9,900)	800	12,100	20,100	23,100	4,700	
Market impact	–	3,600	18,200	20,600	42,400	21,500	
Acquisitions/dispositions	–	–	–	(4,000)	(4,000)	58,100	
Foreign exchange	(1,100)	(2,200)	(2,400)	(2,200)	(7,900)	3,600	
Total market, acquisitions/dispositions and foreign exchange impact	(1,100)	1,400	15,800	14,400	30,500	83,200	
AUM, balance at end of year	\$ 36,900	\$ 200,900	\$ 128,700	\$ 273,400	\$ 639,900	\$ 586,300	

Business segment results

Results by business segments

Table 13								
	2017							2016
	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets (1)	Corporate Support (1)	Total	Total
(Millions of Canadian dollars, except percentage amounts)								
Net interest income	\$ 10,787	\$ 2,248	\$ –	\$ 679	\$ 3,565	\$ (139)	\$ 17,140	\$ 16,531
Non-interest income (2)	5,076	7,827	4,566	1,756	4,617	(313)	23,529	22,264
Total revenue (2)	\$ 15,863	\$ 10,075	\$ 4,566	\$ 2,435	\$ 8,182	\$ (452)	\$ 40,669	\$ 38,795
PCL	1,054	34	–	–	62	–	1,150	1,546
PBCAE	–	–	3,053	–	–	–	3,053	3,424
Non-interest expense (2)	7,176	7,611	584	1,466	4,719	238	21,794	20,526
Net income before income taxes	\$ 7,633	\$ 2,430	\$ 929	\$ 969	\$ 3,401	\$ (690)	\$ 14,672	\$ 13,299
Income tax	1,878	592	203	228	876	(574)	3,203	2,841
Net income	\$ 5,755	\$ 1,838	\$ 726	\$ 741	\$ 2,525	\$ (116)	\$ 11,469	\$ 10,458
ROE (3)	28.3%	13.2%	41.8%	22.7%	12.9%	n.m.	17.0%	16.3%
Average assets	\$ 421,100	\$ 88,100	\$ 14,300	\$ 138,100	\$ 494,400	\$ 30,600	\$ 1,186,600	\$ 1,176,400

(1) Net interest income, total revenue and net income before income taxes are presented in Capital Markets on a taxable equivalent basis (teb). The teb adjustment is eliminated in the Corporate Support segment. For a further discussion, refer to the How we measure and report our business segments section.

(2) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(3) This measure may not have a standardized meaning under GAAP and may not be comparable to similar measures disclosed by other financial institutions. For further details, refer to the Key performance and non-GAAP measures section.

n.m. not meaningful

How we measure and report our business segments

Our management reporting framework is intended to measure the performance of each business segment as if it were a stand-alone business and reflects the way that the business segment is managed. This approach is intended to ensure that our business segments' results include all applicable revenue and expenses associated with the conduct of their business and depicts how management views those results.

Key methodologies

The following outlines the key methodologies and assumptions used in our management reporting framework. These are periodically reviewed by management to ensure they remain valid.

Expense allocation

To ensure that our business segments' results include expenses associated with the conduct of their business, we allocate costs incurred or services provided by Technology & Operations and Functions, which are directly undertaken or provided on the business segments' behalf. For other costs not directly attributable to our business segments, including overhead costs and other indirect expenses, we use our management reporting framework for allocating these costs to each business segment in a manner that is intended to reflect the underlying benefits. In 2017, we maintained some of our severance and related costs in Corporate Support.

Capital attribution

Our management reporting framework also determines the attribution of capital to our business segments in a manner that is intended to consistently measure and align economic costs with the underlying benefits and risks associated with the activities of each business segment. The amount of capital assigned to each business segment is referred to as attributed capital. Unattributed capital and associated net charges are reported in Corporate Support. For further information, refer to the Capital management section.

Funds transfer pricing

Funds transfer pricing refers to the pricing of intra-company borrowing or lending for management reporting purposes. We employ a funds transfer pricing process to enable risk-adjusted management reporting of segment results. This process determines the costs and revenue for intra-company borrowing and lending of funds after taking into consideration our interest rate risk and liquidity risk management objectives, as well as applicable regulatory requirements.

Provisions for credit losses

PCL are recorded to recognize estimated losses on impaired loans and losses that have been incurred but not yet identified in our total loans portfolio. This credit portfolio includes on-balance sheet exposures, such as loans and acceptances, and off-balance sheet items such as letters of credit, guarantees and unfunded commitments. PCL on impaired loans are included in the results of each business segment to fully reflect the appropriate expenses related to the conduct of each business segment. PCL on loans not yet identified as impaired are included in Corporate Support, as Group Risk Management (GRM) effectively controls this through its monitoring and oversight of various lending portfolios throughout the enterprise. For details on our accounting policy on Allowance for credit losses, refer to Note 2 of our 2017 Annual Consolidated Financial Statements.

In addition to the key methodologies described above, the following highlights the key aspects of how some of our business segments are managed and reported:

- Wealth Management reported results also include disclosure in U.S. dollars, primarily for U.S. Wealth Management (including City National) as we review and manage the results of this business largely in this currency.
- Capital Markets results are reported on a taxable equivalent basis (teb), which grosses up total revenue from certain tax-advantaged sources (Canadian taxable corporate dividends and the U.S. tax credit investment business) to their effective taxable equivalent value with a corresponding offset recorded in the provision for income taxes. We record the elimination of the teb adjustments in Corporate Support. We believe these adjustments are useful and reflect how Capital Markets manages its business, since it enhances the comparability of revenue and related ratios across taxable revenue and our principal tax-advantaged source of revenue. The use of teb adjustments and measures may not be comparable to similar generally accepted accounting principles (GAAP) measures or similarly adjusted amounts disclosed by other financial institutions.
- Corporate Support results include all enterprise level activities that are undertaken for the benefit of the organization that are not allocated to our five business segments, such as enterprise funding, securitizations, net charges associated with unattributed capital, and consolidation adjustments, including the elimination of the teb gross-up amounts.

Key performance and non-GAAP measures

Performance measures

Return on common equity (ROE)

We measure and evaluate the performance of our consolidated operations and each business segment using a number of financial metrics, such as net income and ROE. We use ROE, at both the consolidated and business segment levels, as a measure of return on total capital invested in our business. Management views the business segment ROE measure as a useful measure for supporting investment and resource allocation decisions because it adjusts for certain items that may affect comparability between business segments and certain competitors.

Our consolidated ROE calculation is based on net income available to common shareholders divided by total average common equity for the period. Business segment ROE calculations are based on net income available to common shareholders divided by average attributed capital for the period. For each segment, average attributed capital includes the capital required to underpin various risks as described in the Capital management section and amounts invested in goodwill and intangibles.

The attribution of capital involves the use of assumptions, judgments and methodologies that are regularly reviewed and revised by management as deemed necessary. Changes to such assumptions, judgments and methodologies can have a material effect on the business segment ROE information that we report. Other companies that disclose information on similar attributions and related return measures may use different assumptions, judgments and methodologies.

The following table provides a summary of our ROE calculations:

	2017							2016
	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Corporate Support	Total	Total
(Millions of Canadian dollars, except percentage amounts)								
Net income available to common shareholders	\$ 5,659	\$ 1,775	\$ 718	\$ 725	\$ 2,438	\$ (187)	\$ 11,128	\$ 10,111
Total average common equity (1), (2)	20,000	13,450	1,700	3,200	18,850	8,100	65,300	62,200
ROE (3)	28.3%	13.2%	41.8%	22.7%	12.9%	n.m.	17.0%	16.3%

(1) Total average common equity represents rounded figures.

(2) The amounts for the segments are referred to as attributed capital. Effective the first quarter of 2017, we increased our capital attribution rate to better align with higher regulatory capital requirements.

(3) ROE is based on actual balances of average common equity before rounding.

n.m. not meaningful

Embedded value for Insurance operations

Embedded value is a measure of shareholder value embedded in the balance sheet of our Insurance segment, excluding any value from future new sales. We use the change in embedded value between reporting periods as a measure of the value created by the insurance operations during the period.

We define embedded value as the value of equity held in our Insurance segment and the value of in-force business (existing policies). The value of in-force business is calculated as the present value of future expected earnings on in-force business less the cost of capital required to support in-force business. We use discount rates equal to long-term risk free rates plus a spread. Required capital uses the capital frameworks in the jurisdictions in which we operate.

Key drivers affecting the change in embedded value from period to period are new sales, investment performance, claims and policyholder experience, change in actuarial assumptions, changes in foreign exchange rates and changes in shareholder equity arising from transfers in capital.

Embedded value does not have a standardized meaning under GAAP and may not be directly comparable to similar measures disclosed by other companies. Given that this measure is specifically used for our Insurance segment and involves the use of discount rates to determine the present value of the future expected earnings and capital required for the in-force business, reconciliation to financial statements information is not applicable.

Non-GAAP measures

We believe that certain non-GAAP measures described below are more reflective of our ongoing operating results and provide readers with a better understanding of management's perspective on our performance. These measures enhance the comparability of our financial performance for the year ended October 31, 2017 with results from last year as well as, in the case of economic profit, measure relative contribution to shareholder value. Non-GAAP measures do not have a standardized meaning under GAAP and may not be comparable to similar measures disclosed by other financial institutions.

The following discussion describes the non-GAAP measures we use in evaluating our operating results.

Economic profit

Economic profit is net income excluding the after-tax effect of amortization of other intangibles less a capital charge for use of attributed capital. It measures the return generated by our businesses in excess of our cost of shareholders' equity, thus enabling users to identify relative contributions to shareholder value.

The capital charge includes a charge for common equity and preferred shares. Effective the first quarter of 2017, we revised our cost of equity to 8.5% from 9.0% for 2016, largely as a result of lower long-term interest rates.

The following table provides a summary of our Economic profit:

Economic Profit								Table 15
								2017
(Millions of Canadian dollars)	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Corporate Support	Total	
Net income	\$ 5,755	\$ 1,838	\$ 726	\$ 741	\$ 2,525	\$ (116)	\$ 11,469	
add: Non-controlling interests	(5)	–	–	(1)	–	(35)	(41)	
After-tax effect of amortization of other intangibles	11	179	–	15	–	1	206	
Adjusted net income (loss)	\$ 5,761	\$ 2,017	\$ 726	\$ 755	\$ 2,525	\$ (150)	\$ 11,634	
less: Capital charge	1,791	1,206	154	286	1,690	722	5,849	
Economic profit (loss)	\$ 3,970	\$ 811	\$ 572	\$ 469	\$ 835	\$ (872)	\$ 5,785	
								2016
(Millions of Canadian dollars)	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Corporate Support	Total	
Net income	\$ 5,184	\$ 1,473	\$ 900	\$ 613	\$ 2,270	\$ 18	\$ 10,458	
add: Non-controlling interests	(8)	–	–	(1)	–	(44)	(53)	
After-tax effect of amortization of other intangibles	12	183	–	16	–	1	212	
Adjusted net income (loss)	\$ 5,188	\$ 1,656	\$ 900	\$ 628	\$ 2,270	\$ (25)	\$ 10,617	
less: Capital charge	1,756	1,229	160	316	1,694	738	5,893	
Economic profit (loss)	\$ 3,432	\$ 427	\$ 740	\$ 312	\$ 576	\$ (763)	\$ 4,724	

Results excluding specified items

Our results were impacted by the following specified items:

- For the year ended October 31, 2017, our share of a gain related to the sale by our payment processing joint venture Moneris of its U.S. operations to Vantiv, Inc., which was \$212 million (before- and after-tax) and recorded in Personal & Commercial Banking.
- For the year ended October 31, 2016, a gain from the sale of our home and auto insurance manufacturing business, RBC General Insurance Company, to Aviva Canada Inc. (Aviva), which was \$287 million (\$235 million after-tax) and recorded in Insurance.

The following tables provide calculations of our business segment results and measures excluding these specified items:

Personal & Commercial Banking

Table 16

	2017		
	As reported	Item excluded	
		Gain related to the sale by Moneris (2)	Adjusted
(Millions of Canadian dollars, except percentage amounts) (1)			
Total revenue	\$ 15,863	\$ (212)	\$ 15,651
PCL	1,054	–	1,054
Non-interest expense	7,176	–	7,176
Net income before income taxes	\$ 7,633	\$ (212)	\$ 7,421
Net income	\$ 5,755	\$ (212)	\$ 5,543
Other information			
Non-interest expense	\$ 7,176	\$ –	\$ 7,176
Total revenue	15,863	(212)	15,651
Efficiency ratio	45.2%		45.9%
Revenue growth rate	5.7%		4.3%
Non-interest expense growth rate	3.5%		3.5%
Operating leverage	2.2%		0.8%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(2) Includes foreign currency translation.

Canadian Banking

Table 17

	2017		
	As reported	Item excluded	
		Gain related to the sale by Moneris (2)	Adjusted
(Millions of Canadian dollars, except percentage amounts) (1)			
Total revenue	\$ 14,877	\$ (212)	\$ 14,665
PCL	1,016	–	1,016
Non-interest expense	6,423	–	6,423
Net income before income taxes	\$ 7,438	\$ (212)	\$ 7,226
Net income	\$ 5,571	\$ (212)	\$ 5,359
Other information			
Non-interest expense	\$ 6,423	\$ –	\$ 6,423
Total revenue	14,877	(212)	14,665
Efficiency ratio	43.2%		43.8%
Revenue growth rate	6.2%		4.7%
Non-interest expense growth rate	3.8%		3.8%
Operating leverage	2.4%		0.9%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(2) Includes foreign currency translation.

(Millions of Canadian dollars, except percentage amounts)	2016		
	As reported	Item excluded	
		Gain related to the sale of RBC General Insurance Company	Adjusted
Total revenue	\$ 5,151	\$ (287)	\$ 4,864
PBCAE	3,424	–	3,424
Non-interest expense (1)	623	–	623
Net income before income taxes	\$ 1,104	\$ (287)	\$ 817
Net income	\$ 900	\$ (235)	\$ 665
Other information			
ROE	52.8%		41.0%

(1) Includes Provision for credit losses of \$1 million.

Efficiency ratio excluding the change in fair value of investments in Insurance

Our efficiency ratio is impacted by the change in fair value of investments backing our policyholder liabilities, which is reported in revenue and largely offset in PBCAE.

The following table provides calculations of our consolidated efficiency ratio excluding the change in fair value of investments backing our policyholder liabilities:

Consolidated non-GAAP efficiency ratio

Table 19

(Millions of Canadian dollars, except percentage amounts) (1)	2017			2016		
	As reported	Items excluded		As reported	Items excluded	
		Change in fair value of investments backing policyholder liabilities	Adjusted		Change in fair value of investments backing policyholder liabilities	Adjusted
Total revenue	\$40,669	\$ 58	\$40,727	\$38,795	\$ (633)	\$ 38,162
Non-interest expense	21,794	–	21,794	20,526	–	20,526
Efficiency ratio	53.6%		53.5%	52.9%		53.8%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

Personal & Commercial Banking

Personal & Commercial Banking provides a broad suite of financial products and services, and aims to provide an exceptional client experience to individuals and businesses for their day-to-day banking, purchase of a home and investment needs. We have meaningful relationships with many of our clients underscored by the breadth of our products and depth of expertise across our businesses.

› 13 million

Number of clients

› 6 million

Active digital users

34,773

Employees

Revenue by business lines



- 53% Personal Financial Services
- 21% Business Financial Services
- 20% Cards and Payment Solutions
- 6% Caribbean and U.S. Banking

We operate through two businesses – Canadian Banking and Caribbean & U.S. Banking. Canadian Banking serves our home market in Canada, where we maintain top (#1 or #2) rankings in market share in this competitive environment for all key retail and business financial product categories. We have the largest branch network, the most ATMs and one of the largest mobile sales networks across Canada. In Caribbean & U.S. Banking, we offer a broad range of financial products and services in targeted markets.

In Canada, we compete with other Schedule 1 banks, independent trust companies, foreign banks, credit unions, caisses populaires and auto financing companies.

In the Caribbean, our competition includes banks, trust companies and investment management companies serving retail and corporate customers, as well as public institutions. In the U.S., we compete primarily with other Canadian banking institutions with U.S. operations.

2017 Operating environment

- › Strong employment growth in Canada boosted consumer confidence which resulted in strong volume growth across most of our Canadian Banking lending and deposit products.
- › Continued strong demand for housing in Canada resulted in solid growth in client mortgage balances.
- › Growth in our investment product balances, driven by solid equity market returns and increased client confidence.
- › A low interest rate environment coupled with competitive pressures persisted for most of 2017. This was partially offset by the Bank of Canada rate increases in July and September.
- › Improved credit conditions due to lower national unemployment and improved economic conditions, especially in oil exposed provinces.
- › In the Caribbean, the region continued to experience underlying economic challenges which has negatively impacted growth in our loan and deposit balances.
- › Technology is transforming the way we operate and interact with our clients. Therefore, we continued to invest in digital solutions to improve the client experience and deliver personalized advice.

Strategic priorities

OUR STRATEGY	PROGRESS IN 2017	PRIORITIES IN 2018
Transform how we serve our clients	<p>Continued to provide exceptional and secure client experiences via mobile platforms, releasing more mobile functionality than our competitors</p> <p>Focused on innovating our branch network, including the opening of new alternative branch formats</p>	<p>Deliver anytime, anywhere solutions to our clients across distribution channels, integrating mobile and digital devices and capabilities into our clients' lives</p> <p>Continue to reimagine our branch network to meet the evolving needs of our clients</p>
Accelerate our growth in key segments	<p>Targeted high-growth client segments to increase our presence in and deliver customized advice to underserved groups, including retirees, youth, newcomers and business owners</p>	<p>Focus on engaging key segments to build new and deeper relationships and achieve industry leading volume growth</p>
Rapidly deliver digital solutions to our clients	<p>Leveraged artificial intelligence to create NOMI Insights™ and NOMI Find & Save™, becoming the first bank in Canada to offer clients personalized digital financial insights and a fully automated savings service</p> <p>Introduced Interac E-transfers with iMessage and Siripay</p> <p>Launched MyAdvisor, an online advice platform to remotely connect a client to an advisor</p> <p>Introduced CreditView Dashboard to provide clients with online access to their credit score</p>	<p>Introduce more personalized insights to improve the customer experience while continuing to simplify and digitize everyday banking</p> <p>Enhance the digital experience for our small business and commercial clients and make it easier to do business with us</p>
Innovate to become a more agile and efficient bank	<p>Accelerated our investments to simplify, digitize and automate activities and processes for both clients and employees</p>	<p>Continue to invest in new tools and capabilities and proactively seek ways to simplify internal processes and the client experience</p>
In the Caribbean	<p>Continued to streamline our branch network and invest in our mobile banking platform</p> <p>Rolled out voice enabled ATMs in the Trinidad market – a first of its kind</p>	<p>Continue to transform our business by investing in our distribution network supported by digital innovations, self-serve channels, redesigned branches and a proactive mobile sales force to grow and retain our target retail, business and corporate client base</p>
In the U.S.	<p>Continued strong growth in our U.S. cross-border client base supported by significant enhancements to our online banking capabilities, driving increased client engagement</p>	<p>Strive to fully digitize our account opening processes, deliver on targeted marketing, content and service partnerships and further enhancements to the digital banking experience to drive client acquisition and volume growth</p>

Outlook

The Canadian economy is expected to grow by 2.1% in calendar 2018, driven by stronger business investment, exports and government spending, offset by slower consumer spending growth. Given recent regulatory measures implemented by the Federal government in 2017, we expect the housing market to moderate, which could impact demand for mortgage products. Although the BoC raised its overnight rate twice in 2017, we expect a pause until the second calendar quarter of 2018 as the BoC remains cautious regarding future rate increases. The rate increases in 2017, as well as any future increases, will continue to have an impact on our net interest margins, partially offset by ongoing competitive pressures. We continue to maintain our focus on strengthening business performance by pursuing industry leading volume growth, operational efficiency efforts and channel transformation to achieve our vision of being a Digitally Enabled Relationship Bank.

In the Caribbean, we are focused on transforming our business in order to be the best bank for our target retail, business and corporate clients, by building an organization with a multi-channel distribution network supported by digital innovations.

For further details on our general economic review and outlook, refer to the Economic, market and regulatory review and outlook section.

(Millions of Canadian dollars, except percentage amounts and as otherwise noted) (1)	2017	2016
Net interest income	\$ 10,787	\$ 10,337
Non-interest income	5,076	4,675
Total revenue	15,863	15,012
PCL	1,054	1,122
Non-interest expense	7,176	6,933
Income before income taxes	7,633	6,957
Net income	\$ 5,755	\$ 5,184
Revenue by business		
Canadian Banking	\$ 14,877	\$ 14,009
Caribbean & U.S. Banking	986	1,003
Key ratios		
ROE	28.3%	27.5%
NIM	2.68%	2.68%
Efficiency ratio	45.2%	46.2%
Efficiency ratio adjusted (2)	45.9%	n.a.
Operating leverage	2.2%	1.3%
Operating leverage adjusted (2)	0.8%	n.a.
Selected average balance sheet information		
Total assets	\$ 421,100	\$ 403,800
Total earning assets	403,100	385,400
Loans and acceptances	402,500	383,900
Deposits	344,400	320,100
Other information		
AUA (3)	\$ 264,800	\$ 239,600
AUM	4,600	4,600
Number of employees (FTE) (4)	34,773	35,362
Effective income tax rate	24.6%	25.5%
Credit information		
Gross impaired loans as a % of related loans and acceptances	0.36%	0.43%
PCL on impaired loans as a % of average net loans and acceptances	0.26%	0.29%

- (1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.
- (2) Measures have been adjusted by excluding our share of the Q1 2017 gain related to the sale of the U.S. operations of Moneris of \$212 million (before- and after-tax). These are non-GAAP measures. For further details, refer to the Key performance and non-GAAP measures section.
- (3) AUA includes \$18.4 billion and \$8.4 billion (2016 – \$18.6 billion and \$9.6 billion) of securitized residential mortgages and credit card loans, respectively.
- (4) Amounts have been revised from previously reported.
- n.a. not applicable

Financial performance

2017 vs. 2016

Net income increased \$571 million or 11% from the prior year. Excluding our share of the gain related to the sale of the U.S. operations of Moneris of \$212 million (before- and after-tax), net income increased \$359 million or 7%, mainly due to volume growth of 6%. Higher fee-based revenue in Canada and lower PCL also contributed to the increase. These factors were partially offset by higher costs, including costs in support of business growth.

Total revenue increased \$851 million or 6% from the prior year. Excluding our share of the gain noted previously, revenue increased \$639 million or 4% mainly due to volume growth of 6%, and higher fee-based revenue in Canada primarily attributable to higher balances driving higher mutual fund distribution fees. Higher card service revenue due to higher purchase volumes also contributed to the increase.

NIM was flat.

PCL decreased \$68 million or 6%, with the PCL ratio improving 3 bps, largely due to lower provisions in our Canadian lending portfolios. For further details, refer to Credit quality performance in the Credit Risk section.

Non-interest expense increased \$243 million or 4%, primarily attributable to higher costs in support of business growth reflecting ongoing investments in technology, including digital initiatives, and higher marketing costs. Higher staff-related costs, including severance, and an impairment related to properties held for sale in the Caribbean also contributed to the increase. These factors were partially offset by the continued benefits from our efficiency management activities.

Average loans and acceptances increased \$19 billion or 5%, largely due to growth in Canadian residential mortgages and business loans.

Average deposits increased \$24 billion or 8%, reflecting growth in business and personal deposits.

Results excluding the specified item noted previously are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

In Canada, we operate through three business lines: Personal Financial Services, Business Financial Services, and Cards and Payment Solutions. The following provides a discussion of our consolidated Canadian Banking results.

Canadian Banking financial highlights		Table 21
(Millions of Canadian dollars, except percentage amounts and as otherwise noted) (1)	2017	2016
Net interest income	\$ 10,128	\$ 9,683
Non-interest income	4,749	4,326
Total revenue	14,877	14,009
PCL	1,016	1,080
Non-interest expense	6,423	6,186
Net income before income taxes	7,438	6,743
Net income	\$ 5,571	\$ 5,002
Revenue by business		
Personal Financial Services	\$ 8,331	\$ 7,986
Business Financial Services	3,357	3,190
Cards and Payment Solutions	3,189	2,833
Key Ratios		
ROE	32.9%	32.6%
NIM	2.62%	2.63%
Efficiency ratio	43.2%	44.2%
Efficiency ratio adjusted (2)	43.8%	n.a.
Operating leverage	2.4%	1.2%
Operating leverage adjusted (2)	0.9%	n.a.
Selected average balance sheet information		
Total assets	\$ 398,500	\$ 381,000
Total earning assets	386,000	368,100
Loans and acceptances	393,400	374,600
Deposits	326,100	301,400
Other information		
AUA (3)	\$ 256,400	\$ 231,400
Number of employees (FTE) (4)	31,902	32,297
Effective income tax rate	25.1%	25.8%
Credit information		
Gross impaired loans as a % of related loans and acceptances	0.24%	0.27%
PCL on impaired loans as a % of average net loans and acceptances	0.26%	0.29%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(2) Measures have been adjusted by excluding our share of the Q1 2017 gain related to sale of the U.S. operations of Moneris of \$212 million (before- and after-tax). These are non-GAAP measures. For further details, refer to the Key performance and non-GAAP measures section.

(3) AUA includes \$18.4 billion and \$8.4 billion (2016 – \$18.6 billion and \$9.6 billion) of securitized residential mortgages and credit card loans, respectively.

(4) Amounts have been revised from previously reported.

n.a. not applicable

Financial performance 2017 vs. 2016

Net income increased \$569 million or 11% compared to last year. Excluding our share of the gain related to the sale of the U.S. operations of Moneris of \$212 million (before- and after-tax), net income increased \$357 million or 7%, largely due to volume growth of 6%, partially offset by lower spreads. Higher fee-based revenue and lower PCL also contributed to the increase. These factors were partially offset by higher costs, including costs in support of business growth.

Total revenue increased \$868 million or 6% compared to last year. Excluding our share of the gain noted previously, revenue increased \$656 million or 5%, mainly due to volume growth of 6%, partially offset by lower spreads, and higher fee-based revenue primarily attributable to higher balances driving higher mutual fund distribution fees. Increased card service revenue due to higher purchase volumes and higher foreign exchange revenue also contributed to the increase.

Net interest margin decreased 1 bp compared to last year.

PCL decreased \$64 million or 6%, with the PCL ratio improving 3 bps, largely due to lower provisions in our personal lending portfolios. For further details, refer to Credit quality performance in the Credit Risk section.

Non-interest expense increased \$237 million or 4%, primarily attributable to higher costs in support of business growth reflecting ongoing investments in technology, including digital initiatives, and higher marketing costs. Higher staff-related costs, including severance, also contributed to the increase. These factors were partially offset by continued benefits from our efficiency management activities.

Average loans and acceptances increased \$19 billion or 5%, largely due to growth in residential mortgages and business loans.

Average deposits increased \$25 billion or 8%, reflecting growth in business and personal deposits.

Results excluding the specified item noted previously are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Business line review

Personal Financial Services

Personal Financial Services offers a full range of products focused on meeting the needs of our individual Canadian clients at every stage of their lives through a wide range of financing and investment products and services, including home equity financing, personal lending, deposit accounts, Canadian private banking, indirect lending (including auto financing), mutual funds distribution and self-directed brokerage accounts, and Guaranteed Investment Certificates (GICs). We rank #1 or #2 in market share for all key personal banking products in Canada and our retail banking network is the largest in Canada with 1,235 branches and 4,290 ATMs.

Financial performance

Total revenue increased \$345 million or 4% compared to last year, primarily reflecting volume growth of 5% largely in residential mortgages and deposits, partially offset by lower spreads. Increased fee-based revenue primarily attributable to higher balances driving higher mutual fund distribution fees also contributed to the increase.

Average residential mortgages increased 6% compared to last year mainly due to solid housing market activity. Average deposits increased 5% from last year largely reflecting the acquisition of new clients and deepening of our existing relationships. Strong market appreciation and net sales resulted in continued growth in client mutual fund balances.

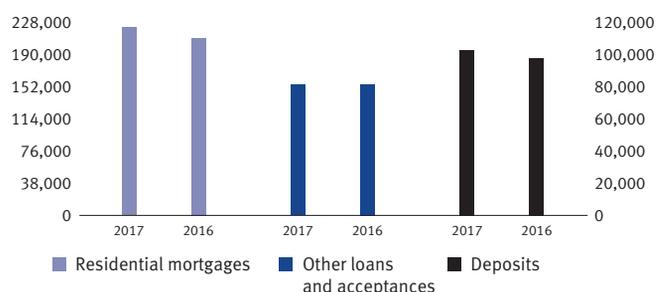
Selected highlights

Table 22

(Millions of Canadian dollars, except number of)	2017	2016
Total revenue (1)	\$ 8,331	\$ 7,986
Other information (average)		
Residential mortgages	222,500	210,400
Other loans and acceptances	81,400	81,800
Deposits (2)	195,700	185,600
Branch mutual fund balances (3)	148,400	132,100
AUA – Self-directed brokerage (3)	79,600	69,700
Number of:		
New deposit accounts opened (thousands)	1,306	1,346
Branches	1,235	1,268
ATM	4,290	4,555

- (1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.
- (2) Includes GIC balances.
- (3) Represents year-end spot balances.

Average residential mortgages, personal loans and deposits
(Millions of Canadian dollars)



Business Financial Services

Business Financial Services offers a wide range of lending, leasing, deposit, investment, foreign exchange, cash management, auto dealer financing (floor plan), trade products and services to small and medium-sized commercial businesses, as well as agriculture and agribusiness clients across Canada. Our business banking network has the largest team of relationship managers and specialists in the industry. Our strong commitment to our clients has resulted in our leading market share in business loans and deposits.

Financial performance

Total revenue increased \$167 million or 5% compared to last year, largely reflecting volume growth of 11%, partially offset by lower spreads.

Average loans and acceptances increased 9% and average deposits were up 13%, mainly due to our strategy of new client acquisition in select business segments and markets, as well as increased activity from existing clients.

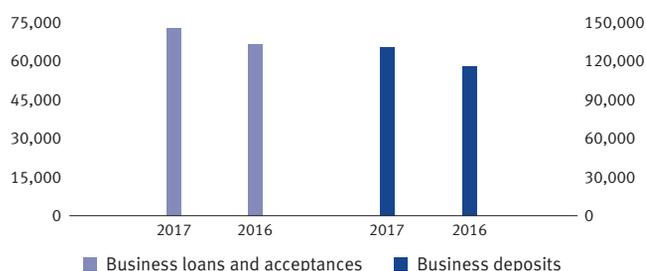
Selected highlights

Table 23

(Millions of Canadian dollars)	2017	2016
Total revenue	\$ 3,357	\$ 3,190
Other information (average)		
Loans and acceptances	72,500	66,400
Deposits (1)	130,400	115,800

- (1) Includes GIC balances.

Average business loans and acceptances and business deposits
(Millions of Canadian dollars)



Cards and Payment Solutions

Cards and Payment Solutions provides a wide array of credit cards with loyalty and reward benefits, and payment products and solutions within Canada. We have over 7 million credit card accounts and have approximately 23% market share of Canada's credit card purchase volume. In addition, this business line includes our 50% interest in Moneris, our payment processing joint venture which sold its U.S. operations to Vantiv, Inc. during the year.

Financial performance

Total revenue increased \$356 million or 13% compared to last year. Excluding our share of the gain noted previously, revenue increased \$144 million or 5% mainly driven by higher loan balances and increased purchase volumes.

Average credit card balances increased 6% and net purchase volumes increased 9% reflecting higher client activity, underscored by the strength of our proprietary rewards program and our co-brand relationships.

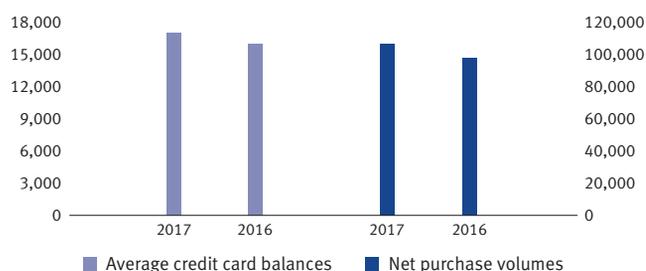
Results excluding the specified item noted previously are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Selected highlights

Table 24

(Millions of Canadian dollars)	2017	2016
Total revenue	\$ 3,189	\$ 2,833
Other information		
Average credit card balances	17,000	16,000
Net purchase volumes	106,600	97,400

Average credit card balances and net purchase volumes
(Millions of Canadian dollars)



Caribbean & U.S. Banking

Our Caribbean Banking business offers a comprehensive suite of banking products and services, as well as international financing and trade promotion services through extensive branch, ATM, online and mobile banking networks.

Our U.S. cross-border banking business serves the needs of our Canadian clients within the U.S., and offers a broad range of financial products and services to individual and business clients across all 50 states.

Financial performance

Total revenue was down \$17 million or 2% from last year, primarily due to lower volumes and the impact of foreign exchange translation.

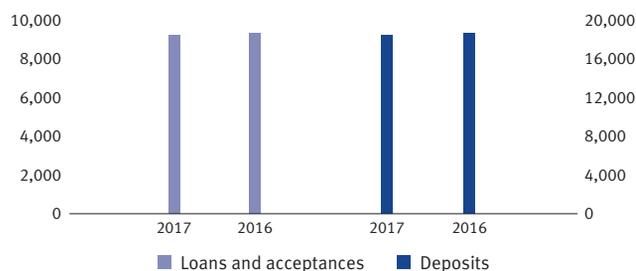
Average loans and acceptances decreased 2%, and average deposits decreased 2%, mostly due to lower client activity and the impact of foreign exchange translation.

Selected highlights

Table 25

(Millions of Canadian dollars, number of and percentage amounts)	2017	2016
Total revenue	\$ 986	\$ 1,003
Other information		
Net interest margin	3.85%	3.78%
Average loans and acceptances	\$ 9,100	\$ 9,300
Average deposits	18,300	18,700
AUA	8,400	8,200
AUM	4,600	4,600
Number of:		
Branches	67	77
ATM	266	276

Average loans and deposits (Millions of Canadian dollars)



Wealth Management is a global business serving clients in key financial centres. We serve high net worth (HNW) and ultra-high net worth (UHNW) individual and institutional clients with a comprehensive suite of advice-based solutions and strategies to help them achieve their financial goals.

\$10.1 billion

Total revenue

> 4,800

Client-facing advisors

> \$19 billion

AUA net flows

Asset under Administration



- 88% Personal
- 11% Institutional
- 1% Mutual Funds

Asset under Management



- 32% Mutual Funds
- 34% Personal
- 34% Institutional

Our lines of businesses are comprised of Canadian Wealth Management, U.S. Wealth Management (including City National), Global Asset Management (GAM) and International Wealth Management.

- Canadian Wealth Management is the largest full-service wealth advisory business in Canada as measured by AUA
- U.S. Wealth Management (including City National) is among the top 10 full-service brokerage firms in terms of AUA and number of advisors
- GAM is the largest retail fund company in Canada as well as a leading institutional asset manager
- International Wealth Management serves HNW and UHNW clients primarily through key financial centres in Europe and Asia.

2017 Operating environment

- › In 2017, the Canadian and U.S. economies continued to expand and respective central banks increased core interest rates. The strong economic performance resulted in improved investor confidence and stronger equity markets driving higher assets under management and assets under administration.
- › Net sales and net new assets also benefitted from strong equity markets, offsetting the negative returns of the bond market as interest rates increased and are anticipated to continue rising in 2018.
- › Strong loan growth and increased spreads due to the rising interest rate environment, mainly in the U.S., contributed to net interest income growth.
- › Technology is transforming the way we operate and interact with our clients. Therefore, we continue to invest in digital solutions to anticipate and meet changing client preferences and increase efficiencies.

Strategic priorities

OUR STRATEGY	PROGRESS IN 2017	PRIORITIES IN 2018
In select global financial centres, become the most trusted regional private bank	Continued to deliver comprehensive value to key HNW and UHNW client segments by providing a more integrated and tailored proposition across multiple solutions, including investments, deposits, credit and trust services	Continue to leverage our global strengths and capabilities to drive growth in HNW and UHNW client segments Continue to enhance our product offering and distribution capabilities
In Canada, be the premier service provider for HNW and UHNW clients	Maintained our position as industry leader in our full-service private wealth business Improved client experience and advisor productivity through enhanced digital engagement (e.g., launch of the Advisor's Virtual Assistant application) Launched the Money in Motion initiative to further solidify our expertise around business owners, succession and wealth planning	Continue to differentiate client experience that is digitally-enabled and supported by data-driven insights Deepen client relationships jointly with our partners (e.g., Private Banking and Commercial Banking in Personal & Commercial Banking)
In the U.S., become the leading private and commercial bank and wealth manager in our key markets	Invested in capabilities, technology and talent to grow our full-service brokerage business Expanded City National business model to select high growth markets with strong RBC Wealth Management and Capital Markets presence, including Washington, D.C. and Minneapolis	Continue to strive to deliver an exceptional client experience for targeted HNW, UHNW, middle market and business banking segments Leverage the combined strengths within U.S. Wealth Management (including City National) and Capital Markets with a view to accelerating growth in the U.S.
In asset management, be a leading, diversified asset manager focused on global institutional and North American retail clients	Maintained #1 market share in Canadian mutual fund assets under management Continued to drive growth in U.S. and international institutional clients in select investment capabilities	Strengthen our partnerships with Personal & Commercial Banking, other Wealth Management businesses and third-party distributors to defend and grow our distribution reach Grow our global institutional asset management business, particularly in relevant markets

Outlook

Our diversified businesses are positioned to benefit from our focus on our clients, continued investments in people and technology, volume growth, and rising interest rates. Despite continued geopolitical and regulatory uncertainty in the major global economies, we expect global private wealth accumulation to continue to drive growth in the HNW and UHNW client segments. We will continue to leverage our brand, reputation and financial strength to increase our market share of the HNW and UHNW client segments globally. In addition, changing demographics and rapid advancements in digitization are expected to drive change in client preferences, needs and service models, requiring a continued focus on delivering a digitally-integrated, multi-channel experience for our clients and client-facing professionals.

For further details on our general economic review and outlook, refer to the Economic, market and regulatory review and outlook section.

Wealth Management	Table 26	
(Millions of Canadian dollars, except number of and percentage amounts and as otherwise noted) (1)	2017	2016
Net interest income	\$ 2,248	\$ 1,955
Non-interest income		
Fee-based revenue	5,799	5,323
Transaction and other revenue	2,028	1,725
Total revenue	10,075	9,003
PCL	34	48
Non-interest expense	7,611	7,015
Income before income taxes	2,430	1,940
Net income	\$ 1,838	\$ 1,473
Revenue by business		
Canadian Wealth Management	\$ 2,815	\$ 2,506
U.S. Wealth Management (including City National)	4,891	4,173
U.S. Wealth Management (including City National) (US\$ millions)	3,744	3,155
Global Asset Management	1,994	1,894
International Wealth Management	375	430
Key Ratios		
ROE	13.2%	10.9%
NIM	3.02%	2.84%
Pre-tax margin (2)	24.1%	21.5%
Selected average balance sheet information		
Total assets	\$ 88,100	\$ 83,200
Loans and acceptances	51,500	49,200
Deposits	93,100	85,400
Attributed capital	13,450	12,950
Other information		
Revenue per advisor (000s) (3)	\$ 1,353	\$ 1,184
AUA (4), (5)	929,200	875,300
AUM (4)	634,100	580,700
Average AUA	898,500	845,800
Average AUM	600,400	560,800
Number of employees (FTE)	16,962	16,385
Number of advisors (6)	4,884	4,780

Estimated impact of U.S. dollar, British pound and Euro translation on key income statement items

(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2017 vs. 2016
Increase (decrease):	
Total revenue (1)	\$ (124)
PCL	1
Non-interest expense (1)	(102)
Net income	(17)
Percentage change in average US\$ equivalent of C\$1.00	1%
Percentage change in average British pound equivalent of C\$1.00	10%
Percentage change in average Euro equivalent of C\$1.00	-%

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

(2) Pre-tax margin is defined as Income before income taxes divided by Total revenue.

(3) Represents investment advisors and financial consultants of our Canadian and U.S. full-service wealth businesses.

(4) Represents year-end spot balances.

(5) In addition to Canadian Wealth Management, U.S. Wealth Managements (including City National), and International Wealth Management, amounts also include AUA of \$6,600 million (2016: \$6,200 million) related to Global Asset Management (GAM).

(6) Represents client-facing advisors across all our wealth management businesses.

Client assets – AUA

Table 27

(Millions of Canadian dollars)	2017	2016
AUA, beginning balance	\$ 875,300	\$ 823,700
Asset inflows	274,300	251,000
Asset outflows	(254,800)	(257,500)
Total net flows	19,500	(6,500)
Market impact	82,700	31,100
Acquisitions/dispositions	(28,200)	17,800
Foreign exchange	(20,100)	9,200
Total market, acquisition/dispositions and foreign exchange impact	34,400	58,100
AUA, balance at end of year	\$ 929,200	\$ 875,300

Client assets – AUM

Table 28

(Millions of Canadian dollars)	2017					2016
	Money market	Fixed income	Equity	Multi-asset and other	Total	Total
AUM, beginning balance	\$ 48,000	\$ 196,800	\$ 100,800	\$ 235,100	\$ 580,700	\$ 492,800
Institutional inflows	27,200	31,100	6,600	4,000	68,900	54,700
Institutional outflows	(37,800)	(32,400)	(4,800)	(2,300)	(77,300)	(71,600)
Personal flows, net	700	2,100	10,300	18,300	31,400	21,500
Total net flows	(9,900)	800	12,100	20,000	23,000	4,600
Market impact	–	3,500	18,200	20,400	42,100	21,600
Acquisition/dispositions	–	–	–	(4,000)	(4,000)	58,100
Foreign exchange	(1,100)	(2,200)	(2,400)	(2,000)	(7,700)	3,600
Total market, acquisition/dispositions and foreign exchange impact	(1,100)	1,300	15,800	14,400	30,400	83,300
AUM, balance at end of year	\$ 37,000	\$ 198,900	\$ 128,700	\$ 269,500	\$ 634,100	\$ 580,700

AUA by geographic mix and asset class

Table 29

(Millions of Canadian dollars)	2017	2016
Canada ⁽¹⁾		
Money market	\$ 21,600	\$ 21,600
Fixed income	35,700	36,300
Equity	94,300	89,100
Multi-asset and other	208,700	180,700
Total Canada	\$ 360,300	\$ 327,700
U.S. ⁽¹⁾		
Money market	\$ 35,100	\$ 36,100
Fixed income	124,500	126,800
Equity	238,100	200,800
Multi-asset and other	45,000	30,500
Total U.S.	\$ 442,700	\$ 394,200
Other International ⁽¹⁾		
Money market	\$ 17,000	\$ 23,300
Fixed income	11,400	21,400
Equity ⁽²⁾	50,100	69,500
Multi-asset and other ⁽²⁾	47,700	39,200
Total International	\$ 126,200	\$ 153,400
Total AUA	\$ 929,200	\$ 875,300

(1) Geographic information is based on the location from where our clients are served.

(2) Amounts have been revised from those previously presented.

Financial performance

2017 vs. 2016

Net income increased \$365 million or 25% from a year ago, mainly due to growth in average fee-based client assets and higher net interest income and transaction revenue. These factors were partially offset by higher variable compensation on improved results and increased costs in support of business growth.

Total revenue increased \$1,072 million or 12%, reflecting growth in average fee-based client assets which benefitted from capital appreciation and net sales, higher net interest income, mainly in the U.S. resulting from the impact of higher interest rates and volume growth, and higher transaction revenue.

PCL decreased \$14 million largely reflecting a recovery in one account in International Wealth Management.

Non-interest expense increased \$596 million or 8%, largely due to higher variable compensation on improved results and higher costs in support of business growth, mainly reflecting higher staff-related costs in the U.S. and ongoing investments in technology, including digital initiatives.

Assets under administration increased \$54 billion or 6%, largely due to capital appreciation and net sales, partially offset by the impacts from the exit of certain international businesses and foreign exchange translation.

Assets under management increased \$53 billion or 9%, primarily reflecting capital appreciation and net sales, partially offset by the impact from foreign exchange translation.

Business line review

Canadian Wealth Management

Canadian Wealth Management includes our full service Canadian wealth advisory business, which is the largest in Canada as measured by AUA, with over 1,700 investment advisors providing comprehensive advice-based financial solutions to HNW and UHNW clients. Additionally, we provide discretionary investment management and estate and trust services to our clients through approximately 78 investment counsellors and 103 trust professionals across Canada.

We compete with domestic banks and trust companies, investment counselling firms, bank-owned full service brokerages and boutique brokerages, mutual fund companies and global private banks. In Canada, bank-owned wealth managers continue to be the major players.

Financial performance

Revenue increased \$309 million or 12% from a year ago, primarily due to higher average fee-based client assets reflecting capital appreciation and net sales.

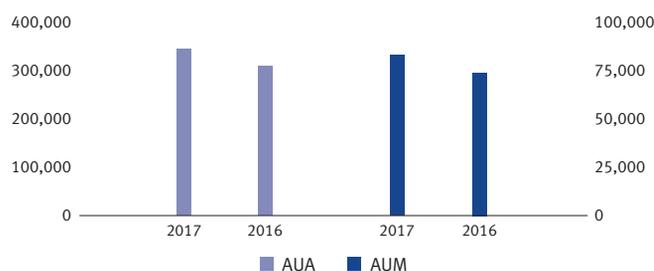
Selected highlights

Table 30

(Millions of Canadian dollars)	2017	2016
Total revenue (1)	\$ 2,815	\$ 2,506
Other information		
Average loans and acceptances	3,300	3,200
Average deposits	17,400	16,300
AUA	359,600	326,600
AUM	90,400	76,000
Average AUA	344,900	309,100
Average AUM	83,700	69,400

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

Average AUA and AUM (Millions of Canadian dollars)



U.S. Wealth Management (including City National)

U.S. Wealth Management (including City National) includes our private client group and City National. Our private client group is the 7th largest full-service wealth advisory firm in the U.S., as measured by number of advisors, with over 1,800 financial advisors. Additionally, our correspondent and advisor services businesses deliver clearing and execution services for small to mid-sized independent broker-dealers and registered investment advisor firms. City National provides comprehensive financial solutions to affluent individuals, entrepreneurs, professionals, their businesses and their families and provides a premier banking and financial experience through a high-touch service model, proactive advice and financial solutions. City National offers a broad range of lending, deposit, cash management, international banking, equipment financing, and other products and services. In the U.S., we operate in a fragmented and highly competitive industry and our competition includes other broker-dealers, commercial banks and other financial institutions that service HNW individuals, entrepreneurs and their businesses.

Financial performance

Revenue increased \$718 million or 17% from a year ago, mainly due to increased net interest income from higher U.S. interest rates and volume growth of 13% in loans and deposits, higher average fee-based client assets reflecting capital appreciation and net sales, and higher transaction revenue.

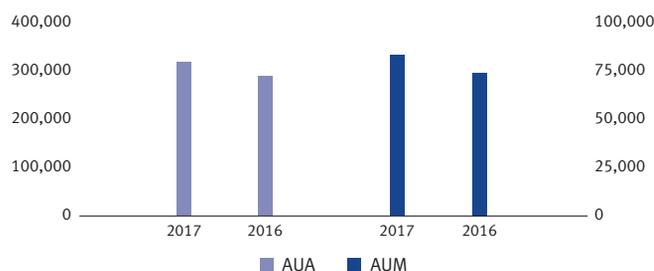
Selected highlights

Table 31

(Millions of Canadian dollars, except as otherwise noted)	2017	2016
Total revenue (1)	\$ 4,891	\$ 4,173
Other information (Millions of U.S. dollars)		
Total revenue (1)	3,744	3,155
Average loans, guarantees and letters of credit	33,500	29,900
Average deposits	47,500	41,200
AUA	343,200	293,900
AUM	92,200	76,700
Average AUA	319,100	289,200
Average AUM	83,500	74,200

(1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

Average AUA and AUM (Millions of U.S. dollars)



Global Asset Management

Global Asset Management provides global investment management services and solutions for individual and institutional investors in Canada, the U.S., the U.K., Europe and Asia. We provide a broad range of investment management services through mutual, pooled and private funds, fee-based accounts and separately managed portfolios. We distribute our investment solutions through a broad network of bank branches, our self-directed and full-service wealth advisory businesses, independent third-party advisors and private banks, and directly to individual clients. We also provide investment solutions directly to institutional clients, including pension plans, insurance companies, corporations, and endowments and foundations.

We are the largest retail fund company in Canada as well as a leading institutional asset manager. We face competition in Canada from banks, insurance companies, and asset management organizations. The Canadian fund management industry is large and mature, but remains a relatively fragmented industry.

In the U.S., our asset management business offers investment management solutions and services primarily to institutional investors and competes with independent asset management firms, as well as those that are part of national and international banks, and insurance companies.

Internationally, through our global capabilities of BlueBay and RBC Global Asset Management®, we offer investment management solutions for institutions and, through private banks including RBC Wealth Management®, to HNW and UHNW investors. We face competition from asset managers that are part of international banks as well as national and regional asset managers in the geographies where we serve clients.

Financial performance

Revenue increased \$100 million or 5% from a year ago, reflecting higher average fee-based client assets due to capital appreciation and net sales.

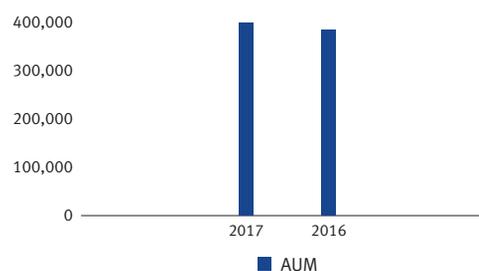
Selected highlights

Table 32

(Millions of Canadian dollars)	2017	2016
Total revenue (1)	\$ 1,994	\$ 1,894
Other information		
Canadian net long-term mutual fund sales (2)	10,689	7,868
Canadian net money market mutual fund sales (redemptions) (2)	240	(439)
AUM	415,200	392,600
Average AUM	398,300	383,400

- (1) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.
- (2) As reported to the Investment Funds Institute of Canada. Includes all prospectus-based mutual funds across our Canadian Global Asset Management businesses.

Average AUM (Millions of Canadian dollars)



International Wealth Management

International Wealth Management includes operations in Europe and Asia. We provide customized and integrated trust, banking, credit and investment solutions to HNW and UHNW clients and corporate clients in key financial centres in Europe and Asia. Competitors to our International Wealth Management business comprise global wealth managers, traditional offshore private banks, domestic wealth managers and U.S. investment-led private client operations.

Financial performance

Revenue decreased \$55 million or 13% from a year ago, mainly reflecting the impact of foreign exchange translation, the exit of certain international businesses, and lower transaction revenue.

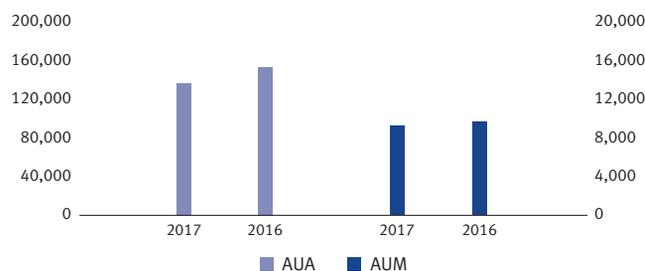
Selected highlights

Table 33

(Millions of Canadian dollars)	2017	2016
Total revenue	\$ 375	\$ 430
Other information		
Average loans, guarantees and letters of credit	5,300	7,200
Average deposits	13,700	14,600
AUA (1)	120,300	148,300
AUM	9,400	9,100
Average AUA (1)	130,500	147,700
Average AUM	9,300	9,700

- (1) Amounts have been revised from those previously presented.

Average AUA and AUM (Millions of Canadian dollars)



RBC Insurance® offers a wide range of life, health, home, auto, travel, wealth and reinsurance advice and solutions, as well as creditor and business insurance services to individual, business and group clients.

\$4.6 billion

Total revenue

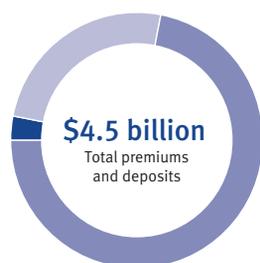
> 4 million

Number of clients

2,691

Employees

Premiums and Deposits



- 72% Life and Health
- 25% Annuity
- 3% P&C

Insurance has operations in Canada and globally, operating under two business lines: Canadian Insurance and International Insurance.

In Canada, we offer our products and services through our proprietary distribution channels, comprised of the field sales force, which includes retail insurance stores, our field sales representatives, advice centres and online, as well as through independent insurance advisors and affinity relationships.

Outside Canada, we operate in reinsurance markets globally offering life, accident and annuity reinsurance products. The competitive environment for each business is discussed below.

2017 Operating environment

- › The insurance industry continues to face a number of challenges and opportunities, including regulatory changes, changing customer preferences and expectations, and increasing technological, digital and mobile transformation in every aspect of the business. Insurers are also refining product and distribution capacities in order to enhance operational efficiencies and manage expenses. To overcome these challenges and take advantage of these opportunities, we have and continue to invest in digitization to enhance access and convenience, reduce costs, and deliver value to clients beyond traditional insurance products.
- › Our International Insurance business continues to be impacted by market conditions in a post-Brexit environment and industry adjustments on new mortality data.
- › Businesses have been revisiting their pension de-risking strategies and have looked to insurance companies to transfer their longevity risk.

Strategic priorities

OUR STRATEGY	PROGRESS IN 2017	PRIORITIES IN 2018
Improve distribution efficiency	<p>We experienced solid sales growth in our Canadian Insurance business, maintaining our #1 ranking in individual disability sales and outpacing industry growth in our individual term life insurance product</p> <p>Our Pension De-risking business achieved record growth and is among the leaders in Canada</p> <p>Our RBC Guaranteed Investment Fund recently reached \$1 billion in AUM and we continue to be one of the fastest growing segregated fund providers in Canada</p>	Continue to improve our distribution efficiency by expanding our proprietary distribution channels and focusing on the delivery of technology and operational solutions
Deepen client relationships	July 1, 2017 marked the one year anniversary of our Aviva relationship. With this relationship, our advisors have benefitted from access to a new set of solutions for automobiles and expanded home coverage as well as access to new technology and tools to offer insurance solutions to our clients	Deepen client relationships by continuing to be an innovative, client-focused provider of a full suite of insurance products
Simplify.Agile.Innovate	<p>We continued our focus on investments to enhance our client experience and our cost effectiveness through ongoing transformation of our legacy business and improving our digital capabilities</p> <p>We launched two apps: RBC Insurance My Benefits, which gives our clients fast and easy access to their group benefits plan; and PATH, a travel mobile app that provides clients with access to emergency medical assistance and up-to-date travel information</p>	Simplify and innovate by accelerating our digital initiatives' time-to-market, improving quality and cost effectiveness
Pursue select international opportunities to grow our reinsurance business	There has been a general slowdown in UK longevity transactions as the market adjusted its pricing to reflect emerging mortality trends in the UK. As such, growth in the UK annuity market slowed in 2017	Pursue select international opportunities, within our risk appetite, with the aim of continuing to grow our core reinsurance business

Outlook

The insurance industry is expected to continue experiencing tremendous change and disruption in the coming year. Traditional market incumbents will see their market share erode if they do not adapt to forces of change that include: evolving customer preferences and expectations, changing demographics and customer profiles, technological transformation in every area of the business, new distribution models, and the emergence of non-traditional competitors. We believe that execution of our business strategy will allow us to continue to thrive in this changing environment.

There was a general slowdown in U.K. longevity transactions during 2017 as the market adjusted its pricing to reflect emerging mortality trends. We believe that the U.K. pension risk transfer (annuity) business offers opportunities for growth in 2018 as the market rebounds. We will continue to build on our capabilities, expand our portfolio of solutions in the annuity business and diversify our sources of longevity risk.

For further details on our general economic review and outlook, refer to the Economic, market and regulatory review and outlook section.

Insurance	Table 34	
(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2017	2016
Non-interest income		
Net earned premiums	\$ 3,875	\$ 3,175
Investment income (1)	453	1,422
Fee income	238	554
Total revenue	4,566	5,151
Insurance policyholder benefits and claims (1)	2,787	3,208
Insurance policyholder acquisition expense	266	216
Non-interest expense (2)	584	623
Income before income taxes	929	1,104
Net income	\$ 726	\$ 900
Revenue by business		
Canadian Insurance	\$ 2,569	\$ 3,373
International Insurance	1,997	1,778
Key ratios		
ROE	41.8%	52.8%
Selected balances and other information		
Total assets	\$ 14,300	\$ 14,400
Attributed capital	1,700	1,700
Other information		
Premiums and deposits (3)	\$ 4,546	\$ 4,594
Canadian Insurance	2,496	2,424
International Insurance	2,050	2,170
Insurance claims and policy benefit liabilities	9,676	9,164
Fair value changes on investments backing policyholder liabilities (1)	(58)	633
Embedded value (4)	7,320	6,886
Number of employees (FTE)	2,691	2,657

- (1) Investment income can experience volatility arising from fluctuation of fair value through profit or loss (FVTPL) assets. The investments which support actuarial liabilities are predominantly fixed income assets designated as at FVTPL. Consequently, changes in the fair values of these assets, are recorded in investment income in the Consolidated Statement of Income and are largely offset by changes in the fair value of the actuarial liabilities, the impact of which is reflected in insurance policyholder benefits and claims.
- (2) Amount includes PCL of \$nil (2016 – \$1 million).
- (3) Premiums and deposits include premiums on risk-based insurance and annuity products, and individual and group segregated fund deposits, consistent with insurance industry practices.
- (4) Embedded value is defined as the sum of value of equity held in our Insurance segment and the value of in-force business (existing policies). For further details, refer to the Key performance and non-GAAP measures section.

Financial performance

2017 vs. 2016

Net income decreased \$174 million or 19% from a year ago, primarily due to the gain on sale of our home and auto insurance manufacturing business, which was sold on July 1, 2016. Excluding the after-tax gain of \$235 million on the sale of RBC General Insurance Company to Aviva Canada Inc., net income increased \$61 million or 9%, mainly due to higher favourable annual actuarial assumption updates, and business growth mainly in Canadian Insurance. These factors were partially offset by lower earnings from new U.K. annuity contracts and reduced earnings associated with the sale of our home and auto insurance manufacturing business, as noted previously.

Total revenue decreased \$585 million or 11%, mainly due to a change of \$691 million related to the fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, largely offset in PBCAE. The prior year also included the associated premiums and a gain of \$287 million relating to our home and auto insurance manufacturing business, as noted previously. These factors were partially offset by higher revenues from group annuity sales in Canadian Insurance and the impact of restructured international life contracts, both of which are largely offset in PBCAE.

PBCAE decreased \$371 million or 11%, mainly due to a change in the fair value of investments backing our policyholder liabilities, largely offset in revenue. Lower claims reflecting the impact from the sale of our home and auto insurance manufacturing business in the prior year and higher favourable annual actuarial assumption updates largely reflecting changes in credit and discount rates and favourable mortality experience, mainly in the U.K., also contributed to the decrease. These factors were partially offset by the impact from group annuity sales and restructured international life contracts, both of which are largely offset in revenue.

Non-interest expense decreased \$39 million or 6%, largely reflecting the impact of the sale of our home and auto insurance manufacturing business in the prior year.

Premiums and deposits were down \$48 million or 1%, reflecting the impact of the sale of our home and auto insurance manufacturing business in the prior year, the impact of foreign exchange translation, and lower premiums from new U.K. annuity contracts, largely offset by business growth, including group annuity sales.

Embedded value increased \$434 million, reflecting the impact of favourable actuarial assumption updates, improved experience and product updates.

Results excluding the specified item noted previously are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Business line review

Canadian Insurance

We offer life, health, property and casualty insurance products, as well as wealth accumulation solutions, to individual and group clients across Canada. Our life and health portfolio includes universal life, term life, critical illness, disability, long-term care insurance and group benefits. We offer a wide range of property and casualty products including home, auto and travel insurance. Our travel products include out-of-province/country medical coverage, and trip cancellation and interruption insurance.

In Canada, the majority of our competitors specialize in life and health or property and casualty products. We hold a leading market position in disability insurance products, have a significant presence in life and travel products, and have a growing presence in wealth solutions as well as in home and auto through our distribution agreement with Aviva.

Financial performance

Total revenue decreased \$804 million or 24% from last year, mainly due to a change in the fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, largely offset in PBCAE. The prior year also included the associated premiums and the gain on sale relating to our home and auto insurance manufacturing business, as noted previously. These factors were partially offset by business growth, primarily reflecting higher revenue from group annuity sales, largely offset in PBCAE.

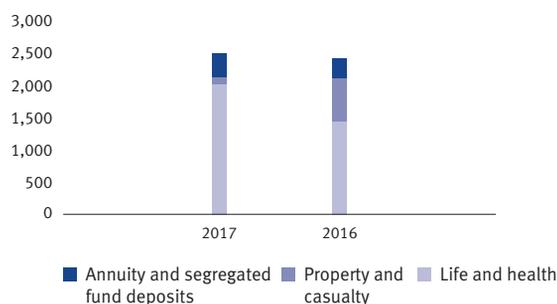
Premiums and deposits increased \$72 million or 3%, as sales growth, primarily related to our group annuity business, more than offset the impact of the sale of our home and auto insurance manufacturing business in the prior year.

Selected highlights

Table 35

(Millions of Canadian dollars)	2017	2016
Total revenue	\$ 2,569	\$ 3,373
Other information		
Premiums and deposits		
Life and health	2,016	1,438
Property and casualty	119	674
Annuity and segregated fund deposits	361	312
Fair value changes on investments backing policyholder liabilities	(63)	575

Premiums and deposits (Millions of Canadian dollars)



International Insurance

International Insurance is primarily comprised of our reinsurance businesses which insure risks of other insurance and reinsurance companies. We offer life and health, accident and annuity reinsurance products.

The global reinsurance market is dominated by a few large players, with significant presence in the U.S., the U.K. and Europe. The reinsurance industry is competitive but barriers to entry remain high.

Financial performance

Total revenue increased \$219 million or 12%, mainly due to the impact of restructured international life contracts, partially offset by a change in the fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, both of which are largely offset in PBCAE.

Premiums and deposits decreased \$120 million or 6%, due to the impact of foreign exchange translation and lower premiums from new U.K. annuity contracts, partially offset by volume growth in international life.

Selected highlights

Table 36

(Millions of Canadian dollars)	2017	2016
Total revenue	\$ 1,997	\$ 1,778
Other information		
Premiums and deposits		
Life and health	1,276	1,335
Property and casualty	(1)	-
Annuity	775	835
Fair value changes on investments backing policyholder liabilities	5	58

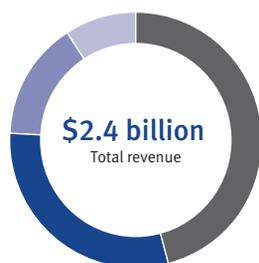
RBC Investor & Treasury Services is a specialist provider of asset services, custody, payments and treasury services for financial and other institutional investors worldwide.

\$4.3 trillion
Assets under administration

23%
Return on equity

4,771
Employees

Revenue by Geography



- 46% North America
- 30% Europe (Ex. UK)
- 15% UK
- 9% Asia-Pacific

We deliver custodial, advisory, financing and other services to safeguard client assets, maximize liquidity, and manage risk across multiple jurisdictions. We rank among the world’s leading global custodians with a network of offices across North America, Europe, U.K., and the Asia-Pacific region. Our team of approximately 5,000 employees serves almost 10 million investors and administers over 6,700 funds.

We have one of the widest transfer agency networks in the market, we are a top-ranked international securities lending service, and we provide short-term funding and liquidity management for RBC. Our transaction banking business is a leading provider of Canadian dollar cash management, correspondent banking, and trade finance for financial institutions globally.

2017 Operating environment

- › The highly competitive environment in the global asset services industry continued to pressure margins.
- › Continued increases in financial services regulations have driven up compliance and technology costs; however, tightening credit spreads, increased FX volumes and interest rate volatility benefitted our funding and liquidity business.

Strategic priorities

OUR STRATEGY	PROGRESS IN 2017	PRIORITIES IN 2018
In Canada, maintain position as the #1 provider of domestic custody, asset services and cash management	Custody revenue relatively flat compared to prior year due to fee pressure and competitive environment	Continue to win new business and deepen relationships with existing clients and onboarding clients without delay
Compete as a leading provider of asset services in the major offshore fund domicile markets of Luxembourg and Ireland	Increased revenue, AUA and profit while continuing to invest in technology to better serve our clients and reduce costs	Capitalize on trading opportunities through strategic positioning of our portfolio and drive client deposit growth
Continue to deliver a high-level of investment in client-centered technology solutions	Continued investment in client-focused technology solutions to develop client-centered digital applications and launched robotics processing automation (RPA) labs in Canada, Luxembourg and Malaysia	Continue to execute on Advanced Client Experience (ACE) program, our multi-year strategic technology program, and our RPA initiatives
Enhance our client centric service offering and improve efficiency	Continued to invest in technology solutions via ACE and RPA while improving efficiency ratio compared to prior year	Prudently manage expenses and execute cost management initiatives

Outlook

In 2018, our aim is to continue to be the leading provider of asset services and cash management in Canada and a leading provider of fund services to asset managers in the key offshore markets of Luxembourg and Ireland. Our focus is to drive top-line growth by continuing to leverage our leadership position in Canada and recognized capabilities in offshore fund services markets to win new business and deepen existing client relationships. We will continue to execute on our strategic and transformational technology initiatives to enhance the client experience. While we expect the global asset services industry to remain challenging in the near-term, we are well-positioned to compete and grow in the continuously changing operating environment.

For further details on our general economic review and outlook, refer to the Economic, market and regulatory review and outlook section.

(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2017	2016
Net interest income	\$ 679	\$ 825
Non-interest income	1,756	1,446
Total revenue	2,435	2,271
Non-interest expense	1,466	1,457
Net income before income taxes	969	814
Net income	\$ 741	\$ 613
Key Ratios		
ROE	22.7%	17.9%
Selected average balance sheet information		
Total assets	\$ 138,100	\$ 142,500
Deposits	132,800	134,300
Client deposits	54,400	52,800
Wholesale funding deposits	78,400	81,500
Attributed capital	3,200	3,350
Other Information		
AUA ⁽¹⁾	4,266,600	3,929,400
Average AUA	4,044,800	3,770,200
Number of employees (FTE)	4,771	4,776

Estimated impact of U.S. dollar, British pound and Euro translation on key income statement items

(Millions of Canadian dollars, except percentage amounts)	2017 vs. 2016
<i>Increase (decrease):</i>	
Total revenue	\$ (43)
Non-interest expense	(24)
Net income	(15)
Percentage change in average US\$ equivalent of C\$1.00	1%
Percentage change in average British pound equivalent of C\$1.00	10%
Percentage change in average Euro equivalent of C\$1.00	–%

(1) Represents period-end spot balances.

Financial performance

2017 vs. 2016

Net income increased \$128 million or 21%, primarily due to higher results across all major businesses driven by funding and liquidity earnings and increased results from our asset services business. These factors were partially offset by higher investment in technology initiatives.

Total revenue increased \$164 million or 7%, mainly due to higher funding and liquidity revenue reflecting tightening credit spreads, and increased revenue from our asset services business driven by higher client activity and growth in client deposits. These factors were partially offset by the impact of foreign exchange translation.

Non-interest expense increased \$9 million reflecting higher investment in technology initiatives, largely offset by the impact of foreign exchange translation.

RBC Capital Markets® is a premier global investment bank providing expertise in banking, finance and capital markets to corporations, institutional investors, asset managers, governments and central banks around the world. Over 2,800 professionals serve clients from 70 offices in 15 countries across North America, the U.K., Europe and Asia & other international regions.

> 14,000

Number of clients

#9

Global league rankings⁽¹⁾

3,970

Employees

Revenue by Geography



- 54% U.S.
- 26% Canada
- 14% U.K. & Europe
- 6% Asia & other international

We operate two main business lines, Corporate and Investment Banking and Global Markets. Our legacy portfolio is grouped under Other.

In North America, we offer a full suite of products and services which include corporate and investment banking, equity and debt origination and distribution, and structuring and trading. In Canada, we compete mainly with Canadian banks where we are a premier global investment bank and market leader with a strategic presence in all lines of capital markets businesses. In the U.S., we have full industry sector coverage and investment banking product range and compete with large U.S. and global investment banks as well as smaller regional firms.

Outside North America, we have a select presence in the U.K. and Europe, and Asia & other international markets, where we offer a diversified set of capabilities in our key sectors of expertise such as energy, mining and infrastructure and we have a growing presence in industrial, consumer, healthcare and technology in Europe. In the U.K. and Europe, we have continued to make experienced hires, and compete in our key sectors of expertise with global and regional investment banks. In our Asia & other international markets, we compete with global and regional investment banks in select products, consisting of fixed income distribution and currencies trading and corporate and investment banking in Australia, Asia and the Caribbean.

2017 Operating environment

- › Financial markets started fiscal 2017 very strong with elevated client trading activity following the U.S. election as well as strong investment banking activity, particularly in North America, amidst improving credit and energy markets.
- › Global investment banking fee pool increased by 7%⁽¹⁾ in the fiscal year from the same period a year ago.
- › The second half of the year was characterized by lower volatility across a range of asset classes and correspondingly lower levels of client activity, market uncertainty (namely around fiscal policy and proposed tax and regulatory reform in the U.S.), as well as a continued rise in geopolitical tensions. Despite these challenges, our business lines have continued to perform well. Our Fixed Income, Currencies and Commodities business performed particularly well despite these headwinds, with our credit trading performance across numerous products in the U.S. driving higher results.
- › Improved credit and energy markets led to lower PCL.

⁽¹⁾ Source: Dealogic, based on global investment bank fees, fiscal 2017

Strategic priorities

OUR STRATEGY	PROGRESS IN 2017	PRIORITIES IN 2018
Maintain our leadership position in Canada	<p>We deepened our existing client relationships and gained new clients by leveraging our strong global capabilities and improving collaboration with enterprise partners to drive operational efficiencies</p> <p>We continued to win significant mandates including acting as financial advisor to Cenovus Energy Inc. on its \$17.7 billion acquisition of assets from ConocoPhillips Co. and leading the deal financing, the largest ever oil & gas asset transaction in North America</p> <p>We also acted as financial advisor to D+H Corporation on its sale to Vista Equity Partners for \$4.8 billion</p>	We will continue to focus on long-term client relationships, leveraging our global capabilities and continuing to improve collaboration with Wealth Management
Expand and strengthen client relationships in the U.S.	<p>We deepened key client relationships from our corporate and investment banking businesses to generate additional revenue</p> <p>We continued to win significant mandates including acting as financial advisor to CSC on its US\$8.5 billion merger with the Enterprise Services Segment of Hewlett Packard Enterprise</p> <p>In our largest left lead high yield transaction in technology, we acted as financial advisor to Novitex, lead left arranger and joint bookrunner on US\$1.45 billion of senior secured credit facilities and joint lead bookrunner on US\$275 million of PIPE (Private Investment in Public Equity) Investment in the US\$2.6 billion combination</p>	<p>We will continue to deepen client relationships in the U.S. by building on our momentum through expanded origination, advisory and distribution activity, and driving cross-selling through our diversified loan book</p> <p>We expect the U.S. to continue to be the world's most attractive market and it will remain Capital Markets' priority growth market</p>
Build on core strengths and capabilities in U.K./Europe and optimize performance in Asia & other international regions	<p>In the U.K. and Europe, we maintained momentum throughout the year and improved profitability through repositioning our fixed income business, as well as growing our corporate and investment banking presence in key markets</p> <p>We acted as joint financial advisor to Quad Gas Group on its acquisition of a 61% stake in the UK gas distribution business of National Grid plc for an enterprise value of £13.8 billion</p> <p>In Asia and other international regions, we continued to focus on our corporate and investment banking, fixed income trading distribution and foreign exchange trading capabilities</p>	<p>In Europe, we will continue to grow and deepen client relationships in Corporate and Investment Banking and Global Markets</p> <p>In Asia, we will aim to optimize the performance of our existing footprint</p>
Optimize capital use to earn high risk-adjusted returns on assets and equity	We continued to focus on the efficient deployment of our capital and growth throughout our businesses by reducing unproductive assets and re-allocating capital to businesses that provide higher returns and increased profitability	Optimize capital use to earn high risk-adjusted returns by maintaining both a balanced approach between investment banking and trading revenue and a disciplined approach to managing the risks and costs of our business

Outlook

Despite geopolitical tensions, market uncertainty surrounding U.S. fiscal policy and tax reform and a historically low volatility environment persisting into fiscal 2018, we remain confident in our franchises' ability to continue to produce strong revenue and earnings growth driven by our diversified geographic and product mix. We remain focused on carrying forward the momentum in our Investment Banking business, with a potential improvement in the underwriting environment particularly for equity origination. Corporate lending continues to be challenged by a lower spread environment. We expect to continue to grow the loan book at a modest pace and with an increased focus on alignment with fee-based business. We remain cautious in our outlook for trading businesses amidst a general market slowdown and uncertainty from lack of volatility. Regulatory headwinds are expected to continue to impact earnings growth in 2018, particularly in our trading businesses, although we will remain diligent in monitoring and managing the impacts of ongoing global trends as a key strategic priority. Capital Markets will strive to maintain its focus on full-service activities in Canada, the U.S. and Europe in 2018, while navigating through significant changes in the regulatory environment.

For further details on our general economic review and outlook, refer to the Economic, market and regulatory review and outlook section.

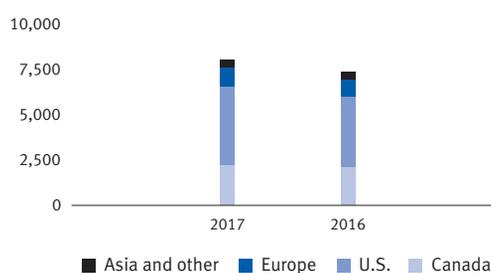
(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2017	2016
Net interest income (1)	\$ 3,565	\$ 3,804
Non-interest income (1)	4,617	4,146
Total revenue (1)	8,182	7,950
PCL	62	327
Non-interest expense	4,719	4,466
Net income before income taxes	3,401	3,157
Net income	\$ 2,525	\$ 2,270
Revenue by business		
Corporate and Investment Banking	\$ 4,000	\$ 3,694
Global Markets	4,466	4,361
Other	(284)	(105)
Key ratios		
ROE	12.9%	12.2%
Selected average balance sheet information		
Total assets	\$ 494,400	\$ 508,200
Trading securities	91,800	104,900
Loans and acceptances	83,400	88,100
Deposits	60,200	61,500
Attributed capital	18,850	17,900
Other information		
Number of employees (FTE)	3,970	3,883
Credit information		
Gross impaired loans as a % of related loans and acceptances	0.63%	1.73%
PCL on impaired loans as a % of average net loans and acceptances	0.07%	0.37%

Estimated impact of U.S. dollar, British pound and Euro translation on key income statement items

(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2017 vs. 2016
<i>Increase (decrease):</i>	
Total revenue	\$ (179)
Non-interest expense	(111)
Net income	(51)
Percentage change in average US\$ equivalent of C\$1.00	1%
Percentage change in average British pound equivalent of C\$1.00	10%
Percentage change in average Euro equivalent of C\$1.00	-%

(1) The taxable equivalent basis (teb) adjustment for 2017 was \$548 million (2016 – \$736 million). For further discussion, refer to the How we measure and report our business segments section.

Revenue by region (Millions of Canadian dollars)



Financial performance

2017 vs. 2016

Net income increased \$255 million or 11%, driven by higher results in Corporate and Investment Banking and Global Markets reflecting increased fee-based revenue, lower PCL and a lower effective tax rate due to changes in earnings mix. These factors were partially offset by higher staff-related costs and the impact of foreign exchange translation.

Total revenue increased \$232 million or 3%, largely reflecting increased loan syndication and debt origination activity mainly in the U.S. and Canada. Higher M&A activity primarily in the U.S. and Europe, higher equity trading revenue in Europe and Asia & other international, and higher investment gains also contributed to the increase. These factors were partially offset by higher residual funding costs and the impact of foreign exchange translation.

PCL decreased \$265 million or 81%, due to lower provisions including higher recoveries primarily in the oil & gas sector, partially offset by higher provisions in the real estate & related sector. For further details, refer to the Credit quality performance section.

Non-interest expense increased \$253 million or 6%, largely reflecting higher costs related to changes in the timing of deferred compensation, increased variable compensation on improved results, and higher compliance costs. These factors were partially offset by the impact of foreign exchange translation.

Business line review

Corporate and Investment Banking

Corporate and Investment Banking comprises our corporate lending, loan syndications, debt and equity origination, mergers and acquisitions (M&A) advisory services, client securitization and the global credit businesses. For debt and equity origination, revenue is allocated between Corporate and Investment Banking and Global Markets based on the contribution of each group in accordance with an established agreement.

Financial performance

Corporate and Investment Banking revenue of \$4,000 million increased \$306 million as compared to last year, despite the unfavourable impact of foreign exchange translation.

Investment banking revenue increased \$248 million or 13%, primarily due to increased loan syndication activity driven by increased market share in the U.S., and higher M&A activity mainly in the U.S. and Europe. Higher investment gains and higher debt origination activity largely in North America also contributed to the increase. These factors were partially offset by lower results from Municipal Banking in the U.S.

Lending and other revenue increased \$58 million or 3%, reflecting improving credit conditions.

Selected highlights

Table 39

(Millions of Canadian dollars)	2017	2016
Total revenue (1)	\$ 4,000	\$ 3,694
Breakdown of revenue (1)		
Investment banking	2,140	1,892
Lending and other (2)	1,860	1,802
Other information		
Average assets	67,900	73,200
Average loans and acceptances	60,500	65,300

- (1) The debt adjustment for 2017 was \$229 million (2016 – \$279 million). For further discussion, refer to the How we measure and report our business segments section.
 (2) Comprises our corporate lending, client securitization, and global credit businesses.

Breakdown of total revenue (Millions of Canadian dollars)



Global Markets

Global Markets comprises our fixed income, foreign exchange, equity sales and trading, repos and secured financing and commodities businesses.

Financial performance

Total revenue of \$4,466 million increased \$105 million or 2% as compared to last year, despite the unfavourable impact of foreign exchange translation.

Revenue in our Fixed income, currencies and commodities business increased \$140 million or 7%, mainly due to higher fixed income trading revenue in the U.S. and Asia & other international, higher debt origination activity in North America, and a gain from the disposition of certain securities. These factors were partially offset by lower commodities and foreign exchange trading revenue across all regions.

Revenue in our Equities business decreased \$63 million or 5%, primarily due to decreased equity origination activity largely in Canada, and lower volume in our cash equities businesses in the U.S.

Revenue in our Repo and secured financing business increased \$28 million or 3%, mainly due to higher equity trading revenue, partially offset by lower fixed income trading revenue.

Selected highlights

Table 40

(Millions of Canadian dollars)	2017	2016
Total revenue (1)	\$ 4,466	\$ 4,361
Breakdown of revenue (1)		
Fixed income, currencies and commodities	2,253	2,113
Equities	1,084	1,147
Repo and secured financing (2)	1,129	1,101
Other information		
Average assets	435,500	472,100

- (1) The debt adjustment for 2017 was \$319 million (2016 – \$457 million). For further discussion, refer to the How we measure and report our business segments section.
 (2) Comprises our secured funding businesses for internal businesses and external clients.

Breakdown of total revenue (Millions of Canadian dollars)



Other

Other includes our legacy portfolio, which mainly consists of our U.S. commercial mortgage-backed securities and structured rates in Asia. In recent years, in order to optimize our capital employed to improve our risk-adjusted returns and reduce our liquidity risk on various products, we have significantly reduced several of our legacy portfolios. Our legacy portfolio assets decreased by 28% as compared to last year.

Financial performance

Revenue decreased \$179 million as compared to last year largely due to higher residual funding costs.

Corporate Support

Corporate Support comprises Technology & Operations, which provide the technological and operational foundation required to effectively deliver products and services to our clients, and Functions, which includes our finance, human resources, risk management, internal audit and other functional groups. Reported results for Corporate Support mainly reflect certain activities related to monitoring and oversight of enterprise activities which are not allocated to business segments. Corporate Support also includes our Corporate Treasury function. For further details, refer to the How we measure and report our business segments section.

Corporate Support

Table 41

(Millions of Canadian dollars, except as otherwise noted)

	2017	2016
Net interest income (loss) ⁽¹⁾	\$ (139)	\$ (390)
Non-interest income (loss) ⁽¹⁾	(313)	(202)
Total revenue ⁽¹⁾	(452)	(592)
PCL	–	51
Non-interest expense	238	30
Net income (loss) before income taxes ⁽¹⁾	(690)	(673)
Income taxes (recoveries) ⁽¹⁾	(574)	(691)
Net income (loss) ⁽²⁾	\$ (116)	\$ 18

(1) Teb adjusted.

(2) Net income reflects income attributable to both shareholders and Non-Controlling Interests (NCI). Net income attributable to NCI for the year ended October 31, 2017 was \$35 million (October 31, 2016 – \$44 million).

Due to the nature of activities and consolidation adjustments reported in this segment, we believe that a comparative period analysis is not relevant. The following identifies material items affecting the reported results in each period.

Total revenue and income taxes (recoveries) in each period in Corporate Support include the deduction of the teb adjustments related to the gross-up of income from Canadian taxable corporate dividends and the U.S. tax credit investment business recorded in Capital Markets. The amount deducted from revenue was offset by an equivalent increase in income taxes (recoveries).

The teb amount for the year ended October 31, 2017 was \$548 million and \$736 million last year.

The following identifies the material items, other than the teb impacts noted previously, affecting the reported results in each period.

2017

Net loss was \$116 million, largely reflecting severance and related charges, net unfavourable tax adjustments, and legal costs. These factors were partially offset by asset/liability management activities.

2016

Net income was \$18 million largely reflecting asset/liability management activities, partially offset by net unfavourable tax adjustments and a \$50 million (\$37 million after-tax) increase in the provision for loans not yet identified as impaired.

Quarterly financial information

Fourth quarter performance

Q4 2017 vs. Q4 2016

Fourth quarter net income of \$2,837 million was up \$294 million or 12% from last year. Diluted EPS of \$1.88 was up \$0.23 and ROE of 16.6% was up 110 bps. Our fourth quarter earnings increased as higher results in Personal & Commercial Banking, Capital Markets, Wealth Management, and Insurance were partially offset by lower earnings in Investment & Treasury Services.

Total revenue increased \$1,159 million or 12%, largely due to the change in the fair value of investments backing our policyholder liabilities, group annuity sales growth and the impact of restructured international life contracts, all of which were largely offset in PBCAE. Volume growth of 6% in Personal & Commercial Banking, growth in average fee-based client assets and higher net interest income reflecting the impact from higher interest rates and volume growth in Wealth Management, and higher equity trading revenue in Capital Markets also contributed to the increase. These factors were partially offset by the impact of foreign exchange translation.

Total PCL decreased \$124 million and the PCL ratio of 17 bps improved 10 bps from last year, mainly reflecting lower provisions and higher recoveries mainly in the oil & gas and real estate & related sectors in Capital Markets. The prior period also included provisions in U.S. Wealth Management (including City National).

PBCAE increased \$740 million, largely reflecting the change in fair value of investments backing our policyholder liabilities, growth in the group annuity business and the impact of restructured international life contracts, all of which are largely offset in revenue. These factors were partially offset by higher favourable annual actuarial assumption updates largely reflecting changes in credit and discount rates and favourable mortality experience, mainly in the U.K.

Non-interest expense increased \$314 million or 6%, primarily reflecting higher variable compensation on improved results in Wealth Management and ongoing investments in technology, including digital initiatives, in Personal & Commercial Banking, Investor & Treasury Services, and Wealth Management. Higher costs related to changes in the timing of deferred compensation in Capital Markets, higher staff-related costs, including severance and other related charges, in Corporate Support, Wealth Management and Personal & Commercial Banking, and charges associated with our real estate portfolio also contributed to the increase. These factors were partially offset by the impact of foreign exchange translation.

Income tax expense decreased \$65 million from last year, and the effective income tax rate decreased from 23.2% last year to 19.9%, due to more favourable tax adjustments and changes in the earnings mix.

Q4 2017 vs. Q3 2017

Net income of \$2,837 million was up \$41 million or 1% compared to the prior quarter, due to lower staff-related costs, including severance, favourable annual actuarial assumption updates largely reflecting changes in credit and discount rates and favourable mortality experience, mainly in the U.K., in Insurance, higher earnings in Personal & Commercial Banking due to higher spreads and volume growth of 2%, and lower PCL due to recoveries in the oil & gas and real estate & related sectors. These factors were partially offset by lower earnings in Capital Markets primarily due to lower fixed income and equity trading revenue across most regions, and lower M&A activity largely in Canada. There were also lower fee-based revenue, higher marketing costs in support of business growth in Personal & Commercial Banking, the impact of foreign exchange translation, and unfavourable tax adjustments in the current quarter.

Quarterly results and trend analysis

Our quarterly results are impacted by a number of trends and recurring factors, which include seasonality of certain businesses, general economic and market conditions, and fluctuations in the Canadian dollar relative to other currencies. The following table summarizes our results for the last eight quarters (the period):

Quarterly results ⁽¹⁾		Table 42							
	2017				2016				
	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1	
(Millions of Canadian dollars, except per share and percentage amounts)									
Net interest income	\$ 4,361	\$ 4,257	\$ 4,198	\$ 4,324	\$ 4,187	\$ 4,123	\$ 4,025	\$ 4,196	
Non-interest income ⁽²⁾	6,162	5,831	6,214	5,322	5,177	6,229	5,597	5,261	
Total revenue ⁽²⁾	\$10,523	\$10,088	\$10,412	\$ 9,646	\$ 9,364	\$10,352	\$ 9,622	\$ 9,457	
PCL	234	320	302	294	358	318	460	410	
PBCAE	1,137	643	1,090	183	397	1,210	988	829	
Non-interest expense ⁽²⁾	5,611	5,537	5,331	5,315	5,297	5,188	4,983	5,058	
Net income before income taxes	\$ 3,541	\$ 3,588	\$ 3,689	\$ 3,854	\$ 3,312	\$ 3,636	\$ 3,191	\$ 3,160	
Income taxes	704	792	880	827	769	741	618	713	
Net income	\$ 2,837	\$ 2,796	\$ 2,809	\$ 3,027	\$ 2,543	\$ 2,895	\$ 2,573	\$ 2,447	
EPS – basic	\$ 1.89	\$ 1.86	\$ 1.86	\$ 1.98	\$ 1.66	\$ 1.88	\$ 1.67	\$ 1.59	
– diluted	1.88	1.85	1.85	1.97	1.65	1.88	1.66	1.58	
Segments – net income (loss)									
Personal & Commercial Banking	\$ 1,404	\$ 1,399	\$ 1,360	\$ 1,592	\$ 1,275	\$ 1,322	\$ 1,297	\$ 1,290	
Wealth Management	491	486	431	430	396	388	386	303	
Insurance	265	161	166	134	228	364	177	131	
Investor & Treasury Services	156	178	193	214	174	157	139	143	
Capital Markets	584	611	668	662	482	635	583	570	
Corporate Support	(63)	(39)	(9)	(5)	(12)	29	(9)	10	
Net income	\$ 2,837	\$ 2,796	\$ 2,809	\$ 3,027	\$ 2,543	\$ 2,895	\$ 2,573	\$ 2,447	
Effective income tax rate	19.9%	22.1%	23.9%	21.5%	23.2%	20.4%	19.4%	22.6%	
Period average US\$ equivalent of C\$1.00	\$ 0.792	\$ 0.770	\$ 0.746	\$ 0.752	\$ 0.757	\$ 0.768	\$ 0.768	\$ 0.728	

(1) Fluctuations in the Canadian dollar relative to other foreign currencies have affected our consolidated results over the period.

(2) Effective Q4 2017, service fees and other costs incurred in association with certain commissions and fees earned are presented on a gross basis in non-interest expense. Comparative amounts have been reclassified to conform with this presentation.

Seasonality

Seasonal factors may impact our results in certain quarters. The first quarter has historically been stronger for our Capital Markets businesses. The second quarter has fewer days than the other quarters, which generally results in a decrease in net interest income and certain expense items. The third and fourth quarters include the summer months which results in lower client activity and may negatively impact the results of our Capital Markets' brokerage business and our Wealth Management's investment management business.

Specified items affecting our consolidated results

- In the first quarter of 2017, our results included our share of a gain related to the sale of the U.S. operations of Moneris of \$212 million (before- and after-tax).
- In the third quarter of 2016, our results included a gain of \$287 million (\$235 million after-tax) related to the sale of RBC General Insurance Company to Aviva.

Trend analysis

The Canadian economy has generally improved over the period, expanding since the second calendar quarter of 2016 as the manufacturing and mining sectors have been boosted by improving oil prices and positive results from the energy sector, after the impact of the Alberta wildfires in May 2016. In particular, strong growth earlier this year reflected robust gains in consumer spending amid strong employment growth, low interest rates, and wealth effects from rising home prices. With strong growth over the first half of 2017, the BoC raised its overnight rate, once in July and again in September. The U.S. economy also experienced growth over the period due to higher household wages, strong job growth, and continued consumer confidence as well as rising business investment. As a result of improving economic conditions, in June 2017 the Fed raised its funds target range for the third time over the period. Global markets were given a boost since the beginning of 2017 as equity markets continued to rebound from the setbacks seen in 2016, particularly in the energy sector. For further details, refer to the Economic and market review and outlook section.

Earnings have generally trended upwards over the period, driven by our Canadian Banking results reflecting solid volume growth, partially offset by lower spreads over a majority of the period, higher fee-based revenue and our share of the gain from the sale of the U.S. operations of Moneris in the first quarter of 2017. Our Wealth Management results reflect growth in average fee-based client assets, mainly due to strong capital appreciation and net sales, volume growth, and the impact from higher U.S. interest rates since the first quarter of 2017. Results from our

acquisition of City National have been reflected in our Wealth Management segment since the first quarter of 2016 and have trended higher since the acquisition. Capital Markets results have trended upwards over the period, driven by higher results in Corporate and Investment Banking and Global Markets driven by increased client activity and generally improved market conditions. The decline in the fourth quarter of 2016 was primarily due to lower trading revenue largely in the U.S. and Europe, and lower equity origination activity in Canada. Results in our Insurance segment were impacted by the gain on the sale of our home and auto insurance manufacturing business in the third quarter of 2016 as noted previously. Investor & Treasury Services results have generally trended higher over the period due to higher funding and liquidity earnings since the first quarter of 2016, reflecting tightening credit spreads and favourable interest and foreign exchange rates movements.

Revenue has generally increased over the period, reflecting solid volume and fee-based revenue growth in our Canadian Banking businesses. The first quarter of 2017 benefitted from the gain on sale of the U.S. operations of Moneris as noted previously. Wealth Management revenue has generally trended upwards primarily due to growth in average fee-based client assets and the inclusion of City National which has resulted in higher net interest income reflecting volume growth and the impact from higher U.S. interest rates since the first quarter of 2017. Capital Markets benefitted from stabilizing credit spreads since the first quarter of 2016, resulting in higher fixed income trading over the period except in the latter half of 2017 which was impacted by reduced market volatility. The favourable impact of foreign exchange translation due to a generally weaker Canadian dollar over the period was partially offset by the strengthening Canadian dollar during the past two quarters. Insurance revenue was primarily impacted by changes in the fair value of investments backing our policyholder liabilities, which is largely offset in PBCAE and benefitted from the gain on sale of our home and auto insurance manufacturing business in the third quarter of 2016, as noted previously, and the annual favourable actuarial adjustments in the fourth quarter.

The credit quality of our portfolios has generally improved over the period. Higher PCL related to our Capital Markets and Canadian Banking businesses was recorded in the first two quarters of 2016, mainly reflecting the impact of the sustained low oil price environment and general economic uncertainty. PCL trended lower in 2017 due to lower provisions and recoveries in our Capital Markets and Canadian Banking portfolios.

PBCAE has fluctuated quarterly as it includes the changes to the fair value of investments backing our policyholder liabilities, which is largely offset in revenue. PBCAE has also increased due to business growth, and has been impacted by actuarial liability adjustments and claims costs over the period.

While we continue to focus on efficiency management activities, non-interest expense has generally trended upwards over the period, mostly to support business growth and due to the inclusion of City National since the first quarter of 2016. Growth in non-interest expense in 2017 mainly reflects higher variable compensation in Wealth Management and Capital Markets on improved results, and was impacted by higher severance in the third quarter of 2017. Higher costs in support of business growth reflecting ongoing investments in technology, including digital initiatives, and an impairment related to properties held for sale in the first quarter of 2017 also contributed to the increase. The unfavourable impact of foreign exchange translation due to a generally weaker Canadian dollar over the period was partially offset by the strengthening Canadian dollar during the past two quarters.

Our effective income tax rate has fluctuated over the period, mostly due to varying levels of income reported in jurisdictions with different tax rates, as well as fluctuating levels of income from tax-advantaged sources. Our effective income tax rate has generally been impacted over the period by higher earnings before income taxes and lower tax-exempt income in 2017.

Results excluding the specified item noted previously are non-GAAP measures. For further details, including a reconciliation, refer to the Key performance and non-GAAP measures section.

Financial condition

Condensed balance sheets

The following table shows our condensed balance sheets:

(Millions of Canadian dollars)	2017	2016
Assets ⁽¹⁾		
Cash and due from banks	\$ 28,407	\$ 14,929
Interest-bearing deposits with banks	32,662	27,851
Securities	218,379	236,093
Assets purchased under reverse repurchase agreements and securities borrowed	220,977	186,302
Loans		
Retail	385,170	369,470
Wholesale	159,606	154,369
Allowance for loan losses	(2,159)	(2,235)
Other – Derivatives	95,023	118,944
– Other ⁽²⁾	74,788	74,535
Total assets	\$ 1,212,853	\$ 1,180,258
Liabilities ⁽¹⁾		
Deposits	\$ 789,635	\$ 757,589
Other – Derivatives	92,127	116,550
– Other ⁽²⁾	247,398	224,745
Subordinated debentures	9,265	9,762
Total liabilities	1,138,425	1,108,646
Equity attributable to shareholders	73,829	71,017
Non-controlling interests	599	595
Total equity	74,428	71,612
Total liabilities and equity	\$ 1,212,853	\$ 1,180,258

(1) Foreign currency-denominated assets and liabilities are translated to Canadian dollars.

(2) Other – Other assets and liabilities include Segregated fund net assets and liabilities, respectively.

2017 vs. 2016

Total assets were up \$33 billion or 3% from last year. Foreign exchange translation decreased total assets by \$33 billion.

Cash and due from banks was up \$13 billion, mainly due to higher deposits with central banks reflecting our management of liquidity and funding risk.

Interest-bearing deposits with banks increased \$5 billion or 17%, largely reflecting higher deposits with central banks.

Securities were down \$18 billion or 8%, largely driven by lower equity trading positions, a decrease in government debt securities reflecting our management of liquidity and funding risk, and the impact of foreign exchange translation. These factors were partially offset by an increase in corporate debt securities in support of business activities.

Assets purchased under reverse repurchase agreements (reverse repos) and securities borrowed increased \$35 billion or 19%, mainly attributable to higher client and business activities, partially offset by higher financial netting and the impact of foreign exchange translation.

Loans were up \$21 billion or 4%, largely due to continued volume growth in residential mortgages in Canada reflecting increased client activities, and higher wholesale loans driven by business growth, partially offset by the impact of foreign exchange translation.

Derivative assets were down \$24 billion or 20%, mainly attributable to lower fair values on interest rate swaps and the impact of foreign exchange translation, partially offset by lower financial netting on our interest rate swaps.

Other assets remained relatively flat.

Total liabilities were up \$30 billion or 3%. Foreign exchange translation decreased total liabilities by \$33 billion.

Deposits increased \$32 billion or 4%, mainly as a result of increased business and retail deposits driven by higher client activity, growth in issuances of fixed-term notes driven by funding requirements, and higher bank deposits due to increased client activity. These factors were partially offset by the impact of foreign exchange translation.

Derivative liabilities were down \$24 billion or 21%, mainly attributable to lower fair values on interest rate swaps and the impact of foreign exchange translation, partially offset by lower financial netting on our interest rate swaps.

Other liabilities increased \$23 billion or 10%, mainly attributable to higher repurchase agreements reflecting business and client activities, partially offset by lower obligations related to securities sold short.

Total equity increased \$3 billion or 4%, largely reflecting earnings, net of dividends.

Off-balance sheet arrangements

In the normal course of business, we engage in a variety of financial transactions that, for accounting purposes, are not recorded on our Consolidated Balance Sheets. Off-balance sheet transactions are generally undertaken for risk, capital and funding management purposes which benefit us and our clients. These include transactions with structured entities and may also include the issuance of guarantees. These transactions give rise to, among other risks, varying degrees of market, credit, liquidity and funding risk, which are discussed in the Risk management section.

We use structured entities to securitize our financial assets as well as assist our clients in securitizing their financial assets. These entities are not operating entities, typically have no employees, and may or may not be recorded on our Consolidated Balance Sheets.

In the normal course of business, we engage in a variety of financial transactions that may qualify for derecognition. We apply the derecognition rules to determine whether we have transferred substantially all the risks and rewards or control associated with the financial assets to a third party. If the transaction meets specific criteria, it may qualify for full or partial derecognition from our Consolidated Balance Sheets.

Securitizations of our financial assets

We periodically securitize our credit card receivables, residential and commercial mortgage loans and bond participation certificates primarily to diversify our funding sources, enhance our liquidity position and for capital purposes. We also securitize residential and commercial mortgage loans as part of our sales and trading activities.

We securitize our credit card receivables, on a revolving basis, through a consolidated structured entity. We securitize single and multiple-family residential mortgages through the National Housing Act Mortgage-Backed Securities (NHA MBS) program. The majority of our securitization activities are recorded on our Consolidated Balance Sheets as we do not meet the derecognition criteria. As at October 31, 2017, we derecognized \$1.2 billion (October 31, 2016 – \$nil) of mortgages where both the NHA and the residual interests in the mortgages were sold to third parties resulting in the transfer of substantially all of the risks and rewards. For further details, refer to Note 6 and Note 7 of our 2017 Annual Consolidated Financial Statements.

We periodically securitize residential mortgage loans for the Canadian social housing program through the NHA MBS program, which are derecognized from our Consolidated Balance Sheets when sold to third party investors. During 2017, we securitized \$13 million of residential mortgage loans for the Canadian social housing program (October 31, 2016 – \$nil).

We also periodically securitize commercial mortgage loans by selling them in collateral pools, which meet certain diversification, leverage and debt coverage criteria, to structured entities, one of which is sponsored by us. Securitized commercial mortgage loans are derecognized from our Consolidated Balance Sheets as we have transferred substantially all of the risks and rewards of ownership of the securitized assets. During the year ended October 31, 2017, we securitized \$407 million of commercial mortgages (October 31, 2016 – \$700 million). Our continuing involvement with the transferred assets is limited to servicing certain of the underlying commercial mortgages sold. As at October 31, 2017, there was \$1.4 billion of commercial mortgages outstanding that we continue to service related to these securitization activities (October 31, 2016 – \$1.3 billion).

In prior years, we participated in bond securitization activities where we purchased government, government-related and corporate bonds and repackaged those bonds in trusts that issue participation certificates, which were sold to third party investors. Securitized bonds are derecognized from our Consolidated Balance Sheets as we have transferred substantially all of the risk and rewards of ownership of the securitized assets. Our continuing involvement with the transferred assets is limited to servicing the underlying bonds. As at October 31, 2017, there were \$49 million of bond participation certificates outstanding related to these prior period securitization activities (October 31, 2016 – \$81 million).

Involvement with unconsolidated structured entities

In the normal course of business, we engage in a variety of financial transactions with structured entities to support our customers' financing and investing needs, including securitization of our clients' financial assets, creation of investment products, and other types of structured financing.

We have the ability to use credit mitigation tools such as third party guarantees, credit default swaps, and collateral to mitigate risks assumed through securitization and re-securitization exposures. The process in place to monitor the credit quality of our securitization and re-securitization exposures involves, among other things, reviewing the performance data of the underlying assets. We affirm our ratings each quarter and formally confirm or assign a new rating at least annually. For further details on our activities to manage risks, refer to the Risk management section.

Below is a description of our activities with respect to certain significant unconsolidated structured entities. For a complete discussion of our interests in consolidated and unconsolidated structured entities, refer to Note 7 of our 2017 Annual Consolidated Financial Statements.

RBC-administered multi-seller conduits

We administer multi-seller conduits which are used primarily for the securitization of our clients' financial assets. Our clients primarily use our multi-seller conduits to diversify their financing sources and to reduce funding costs by leveraging the value of high-quality collateral. The conduits offer us a favourable revenue stream and risk-adjusted return.

We provide services such as transaction structuring, administration, backstop liquidity facilities and partial credit enhancements to the multi-seller conduits. Revenue for all such services amounted to \$287 million during the year (October 31, 2016 – \$252 million).

Our total commitment to the conduits in the form of backstop liquidity and credit enhancement facilities is shown below. The total committed amount of these facilities exceeds the total amount of the maximum assets that may have to be purchased by the conduits under the purchase agreements. As a result, the maximum exposure to loss attributable to our backstop liquidity and credit enhancement facilities is less than the total committed amounts of these facilities.

Liquidity and credit enhancement facilities

Table 44

As at October 31 (Millions of Canadian dollars)	2017				2016			
	Notional of committed amounts (1)	Allocable notional amounts	Outstanding loans (2)	Maximum exposure to loss (3)	Notional of committed amounts (1)	Allocable notional amounts	Outstanding loans (2)	Maximum exposure to loss (3)
Backstop liquidity facilities	\$ 38,622	\$ 35,981	\$ 371	\$ 36,352	\$ 39,462	\$ 36,494	\$ 733	\$ 37,227
Credit enhancement facilities	2,270	2,270	–	2,270	2,235	2,235	–	2,235
Total	\$ 40,892	\$ 38,251	\$ 371	\$ 38,622	\$ 41,697	\$ 38,729	\$ 733	\$ 39,462

(1) Based on total committed financing limit.

(2) Net of allowance for loan losses and write-offs.

(3) Not presented in the table above are derivative assets with a fair value of \$17 million (October 31, 2016 – \$11 million) which are a component of our total maximum exposure to loss from our interests in the multi-seller conduits. Refer to Note 7 of our 2017 Annual Consolidated Financial Statements for more details.

As at October 31, 2017, the notional amount of backstop liquidity facilities we provide decreased by \$840 million or 2% from last year. The decrease in the amount of backstop liquidity facilities provided to the multi-seller conduits as compared to last year primarily reflects the impact of foreign exchange translation. The notional amount of partial credit enhancement facilities we provide increased by \$35 million from last year. The increase in the credit enhancement facilities reflects increased client usage. Total loans extended to the multi-seller conduits under the backstop liquidity facilities decreased by \$362 million from last year primarily due to principal repayments and the impact of foreign exchange translation.

Maximum exposure to loss by client type

Table 45

As at October 31 (Millions of dollars)	2017			2016		
	(US\$)	(C\$)	Total (C\$)	(US\$)	(C\$)	Total (C\$)
Outstanding securitized assets						
Credit cards	\$ 4,058	\$ 510	\$ 5,745	\$ 5,057	\$ 510	\$ 7,292
Auto loans and leases	10,597	3,113	16,783	9,489	2,646	15,372
Student loans	1,747	–	2,253	2,352	–	3,154
Trade receivables	2,358	–	3,042	2,002	51	2,736
Asset-backed securities	287	–	371	547	–	734
Equipment receivables	1,402	–	1,809	1,428	–	1,915
Consumer loans	1,267	–	1,634	1,470	–	1,971
Dealer floor plan receivables	939	852	2,064	760	903	1,922
Fleet finance receivables	766	306	1,294	914	306	1,532
Insurance premiums	134	163	336	–	163	163
Residential mortgages	–	1,377	1,377	–	1,122	1,122
Transportation finance	1,346	179	1,914	1,041	153	1,549
Total	\$ 24,901	\$ 6,500	\$ 38,622	\$ 25,060	\$ 5,854	\$ 39,462
Canadian equivalent	\$ 32,122	\$ 6,500	\$ 38,622	\$ 33,608	\$ 5,854	\$ 39,462

Our overall exposure decreased by 2.1% compared to last year, primarily reflecting the impact of foreign exchange translation. Correspondingly, total assets of the multi-seller conduits decreased by \$831 million or 2.1% over last year, primarily due to decreases in the Credit Card and Student Loans asset classes, which were partially offset by increases in the Auto loans and leases and Transportation finance asset classes. 100% of multi-seller conduits assets were internally rated A or above, consistent with last year. All transactions funded by the unconsolidated multi-seller conduits are internally rated using a rating system which is largely consistent with that of the external rating agencies.

Multiple independent debt rating agencies review all of the transactions in the multi-seller conduits. Transactions financed in two U.S. multi-seller conduits are reviewed by Moody's Investors Service (Moody's), Standard & Poor's (S&P) and Fitch Ratings (Fitch). Transactions in one U.S. multi-seller conduit is reviewed by S&P. Transactions in the Canadian multi-seller conduits are reviewed by DBRS and Moody's. Each applicable rating agency also reviews ongoing transaction performance on a monthly basis and may publish reports detailing portfolio and program information related to the conduits.

As at October 31, 2017, the total asset-backed commercial paper (ABCP) issued by the conduits amounted to \$24.8 billion, an increase of \$44 million or 0.2% from last year. The increase in the amount of ABCP issued by the multi-seller conduits compared to last year is primarily due to an increase in client usage partially offset by foreign exchange translation. The rating agencies that rate the ABCP rated 70% (October 31, 2016 – 67%) of the total amount issued within the top ratings category and the remaining amount in the second highest ratings category.

In October 2014, the U.S. federal regulators adopted regulations related to the credit risk retention requirements of Section 15G of the Securities Exchange Act of 1934 (as added by Section 941 of the Dodd-Frank Act) for asset-backed securities (the Risk Retention Rules). To comply with the Risk Retention Rules, we hold ABCP from RBC administered U.S. multi-seller conduits in an amount equal to at least 5% of the aggregate principal amount of the then outstanding ABCP and any advances under the liquidity loan agreement. As at October 31, 2017, the fair value of the ABCP purchased to comply with the Risk Retention Rules was \$1 billion (October 31, 2016 – \$670 million). This inventory is classified as Securities – Available-for-sale on our Consolidated Balance Sheet.

We also purchase ABCP issued by the multi-seller conduits in our capacity as a placement agent in order to facilitate overall program liquidity. As at October 31, 2017, the fair value of our inventory was \$2 million, a decrease of \$3 million from last year. The fluctuations in inventory held reflect normal trading activity. This inventory is classified as Securities – Trading on our Consolidated Balance Sheets.

Structured finance

We invest in auction rate securities (ARS) of certain trusts which fund their long-term investments in student loans by issuing short-term senior and subordinated notes. Our maximum exposure to loss in these ARS trusts as at October 31, 2017 was \$443 million (October 31, 2016 – \$549 million). The decrease in our maximum exposure to loss is primarily related to the impact of foreign exchange translation. Interest income from the ARS investments, which is reported in Net-interest income, was \$9.8 million during the year (October 31, 2016 – \$6.3 million).

We also provide liquidity facilities to certain municipal bond Tender Option Bond (TOB) trusts in which we have an interest but do not consolidate because the residual certificates issued by the TOB trusts are held by third parties. As at October 31, 2017, our maximum exposure to loss from these unconsolidated municipal bond TOB trusts was \$1,727 million (October 31, 2016 – \$1,640 million). The increase in our maximum exposure to loss relative to last year is primarily due to additional TOB trusts. Fee revenue from the provision of liquidity facilities to these entities, reported in Non-interest income, was \$5.1 million during the year (October 31, 2016 – \$4.7 million).

We provide senior warehouse financing to discrete unaffiliated structured entities that are established by third parties to acquire loans and issue term collateralized loan obligations. A portion of the proceeds from the sale of the term collateralized loan obligations is used to fully repay the senior warehouse financing that we provide. As at October 31, 2017, our maximum exposure to loss associated with the outstanding senior warehouse financing facilities was \$263 million (October 31, 2016 – \$141 million). The increase in our maximum exposure to loss relative to last year is related to the addition of new financing facilities. We provide senior financing to an unaffiliated structured entity to acquire loans. As at October 31, 2017, our maximum exposure to loss associated with the outstanding senior financing facilities was \$1.2 billion (October 31, 2016 – \$1.3 billion).

Investment funds

We invest in hedge funds primarily to provide clients with desired exposures to reference funds. As we make investments in the reference funds, exposures to the funds are simultaneously transferred to clients through derivative transactions. Our maximum exposure to loss in the reference funds is limited to our investments in the funds. As at October 31, 2017, our maximum exposure to loss was \$2.9 billion (October 31, 2016 – \$2.6 billion).

We also provide liquidity facilities to certain third party investment funds. The funds issue unsecured variable-rate preferred shares and invest in portfolios of tax exempt bonds. As at October 31, 2017, our maximum exposure to these funds was \$268 million (October 31, 2016 – \$764 million). The decrease in our maximum exposure compared to last year is primarily due to unwinds of several third party investment funds.

Third-party securitization vehicles

We hold interests in certain unconsolidated third-party securitization vehicles, which are structured entities. We, as well as other financial institutions, are obligated to provide funding to these entities up to our maximum commitment level and are exposed to credit losses on the underlying assets after various credit enhancements. As at October 31, 2017, our maximum exposure to loss in these entities was \$6.1 billion (October 31, 2016 – \$9 billion). The decrease in our maximum exposure to loss compared to last year reflects a reduction in the securitized assets in these entities and the impact of foreign currency translation. Interest and non-interest income earned in respect of these investments was \$87 million (October 31, 2016 – \$95 million).

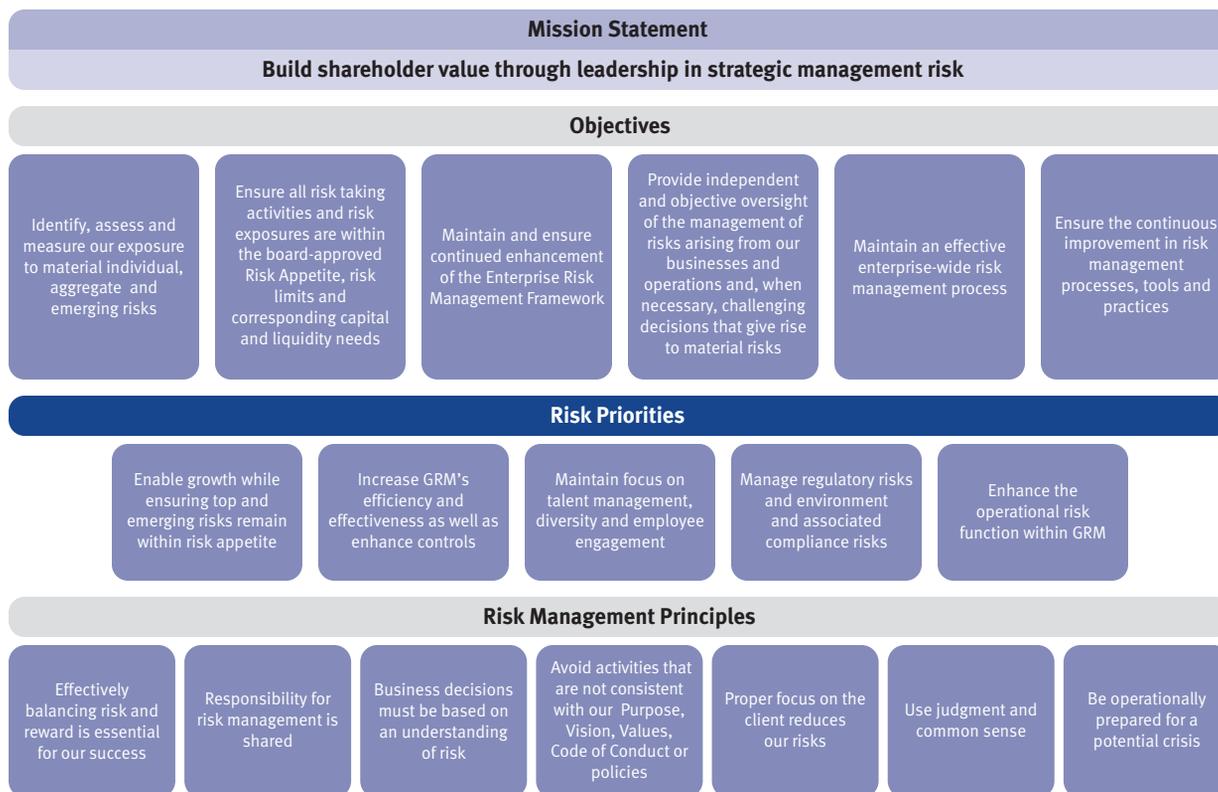
Guarantees, retail and commercial commitments

We provide our clients with guarantees and commitments that expose us to liquidity and funding risks. Our maximum potential amount of future payments in relation to our commitments and guarantee products as at October 31, 2017 amounted to \$355.8 billion compared to \$339.8 billion last year. The increase compared to last year relates primarily to the business growth in both securities lending indemnifications and other credit-related commitments, partially offset by the impact of foreign exchange translation. Refer to Liquidity and funding risk and Note 25 to our 2017 Annual Consolidated Financial Statements for details regarding our guarantees and commitments.

Overview

The ability to manage risk is a core competency at RBC, and is supported by our strong risk conduct and culture, and an effective risk management approach. We define risk as the potential for loss or an undesirable outcome with respect to volatility of actual earnings in relation to expected earnings, capital adequacy or liquidity. Organizational design and governance processes ensure that our Group Risk Management (GRM) function is independent from the businesses it supports.

We manage our risks by ensuring that business activities and transactions provide an appropriate balance of return for the risks assumed and remain within our risk appetite, which is collectively managed across RBC, through adherence to our Enterprise Risk Appetite Framework. Our major risk categories include credit, market, liquidity, insurance, operational, regulatory compliance, strategic, reputation, legal and regulatory environment, competitive, and systemic risks.



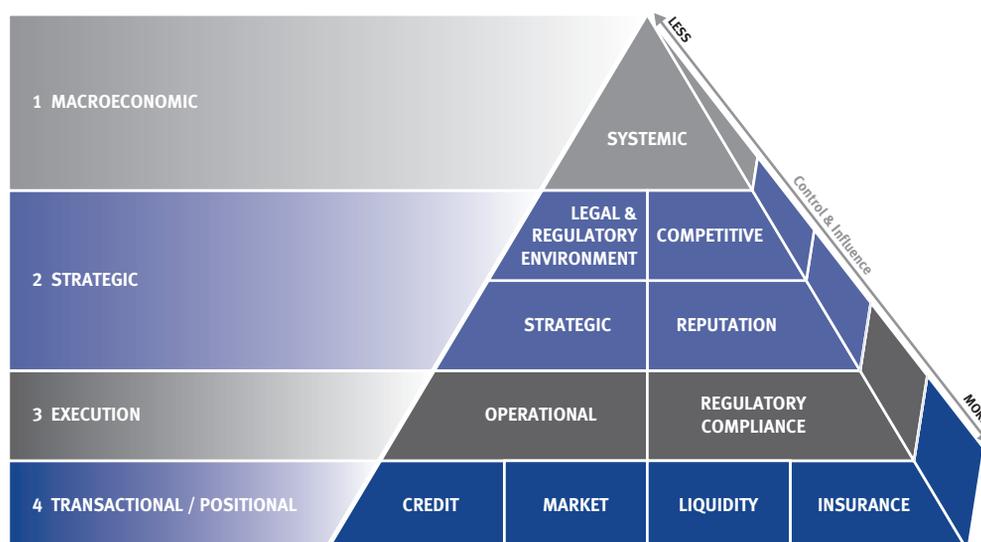
2017 Accomplishments

Throughout 2017, we have:

- Enabled growth while ensuring top and emerging risks remained within our risk appetite;
- Maintained strong credit quality with total PCL ratio of 21 bps and GIL ratio of 46 bps, down 8 bps and 27 bps from last year, respectively;
- Maintained strong capital and liquidity ratios, well above regulatory requirements;
- Avoided major operational risk events;
- Enhanced stress testing capabilities and risk analysis frameworks;
- Continued to strengthen our risk conduct and culture practices; and
- Expanded our risk organization for the U.S. region.

Risk pyramid

Our risk pyramid identifies and categorizes our principal risks and provides a common language and discipline for the identification and assessment of risk in existing businesses, new businesses, products or initiatives, and acquisitions and alliances. It is maintained by GRM and reviewed regularly to ensure all key risks are reflected and ranked appropriately. The placement of the principal risks within the risk pyramid is a function of two primary criteria: risk drivers and level of control and influence.



Risk Drivers

Risk drivers are key factors that would have a strong influence on whether or not one or more of our risks will materialize, which include the following:

1. **Macroeconomic:** Adverse changes in the macroeconomic environment can lead to a partial or total collapse of the real economy or the financial system in any of the regions in which we operate. Examples include deterioration in the Canadian housing market, abrupt changes in the geopolitical environment, or a severe economic slowdown in China. Resultant impacts can materialize as loss of revenue, as well as realization of credit, market or operational risk losses.
2. **Strategic:** Business strategy is a major driver of our risk appetite and the strategic choices and capital allocations we make determine how our risk profile changes. Examples include acquisitions, responding to the threats posed by non-traditional competitors and responding to proposed changes in the regulatory framework. These choices also impact our revenue mix, affecting our exposure to earnings volatility and loss absorption capacity.
3. **Execution:** The complexity and scope of our operations across the globe exposes us to operational and regulatory compliance risks, including fraud, anti-money laundering, cybersecurity and conduct/fiduciary risk.
4. **Transactional/Positional:** This driver of risk presents a more traditional risk perspective. This involves the risk of credit or market losses arising from the lending transactions and balance sheet positions we undertake every day.

Control and Influence

The risk categories are organized vertically from the top of the pyramid to its base according to the relative degree of control and influence we are considered to have over each risk.

The risk categories along the base level of our risk pyramid are those over which we have the greatest level of control and influence. We understand these risks and earn revenue by taking them. These are credit, market, liquidity and insurance risks. Operational risk and regulatory compliance risk, while still viewed as risks over which we have a greater level of control and influence, are ranked higher on the pyramid than the other more controllable risks. This ranking acknowledges the level of controllability associated with people, systems and external events.

Systemic risk is placed at the top of our risk pyramid, and is generally considered the least controllable type of risk arising from the business environment in which we operate. However, we have in place measures for mitigating the impacts of systemic risk such as our diversified business model and funding sources, financial crisis management strategies and protocols, stress testing programs, and product and geographic diversification. Legal and regulatory environment and competitive risks, which can be viewed as somewhat controllable, can be influenced through our role as a corporate entity, and as an active participant in the Canadian and global financial services industry.

Top and emerging risks

Our view of risks is not static. An important component of our enterprise risk management approach is to ensure that continuously evolving top risks and emerging risks are appropriately identified, managed, and incorporated into existing risk management assessment, measurement, monitoring and escalation processes.

These practices ensure management is forward-looking in its assessment of risks to the organization. Identification of top and emerging risks occurs in the course of business development and as part of the execution of risk oversight responsibilities by GRM, Finance, Corporate Treasury, Global Compliance and other control functions.

A top risk is an identified risk that could have a material adverse effect on our financial results, reputation, business model, or strategy in the short to medium term.

Top Risks	Description
<p>Global Uncertainty</p> 	<p>Global uncertainty remained a key risk during 2017. The U.S. administration continues to advocate policy changes related to trade, financial regulation and taxation, which add to overall global uncertainty and volatility. The Canadian economy faces additional risks from the uncertain outcome of negotiations of the North American Free Trade Agreement (NAFTA) and from the U.S. government's posture on financial regulation and tax reform. Concerns remain around the social, political and economic impacts of the changing political landscape in Europe, especially the impact of mass immigration, Brexit negotiations, and the Catalan referendum. Concerns over a possible economic slowdown in China have increased in light of mixed economic data. Global tensions have also increased due to North Korea's military activities.</p>
<p>Canadian Housing and Household Indebtedness</p> 	<p>The housing market is a top concern for the Canadian financial system. Housing prices remain elevated in the Greater Toronto Area and Greater Vancouver Area and affordability remains stretched. We are actively monitoring the impact of recent Government of Ontario measures implemented in an attempt to help cool the housing market. As the BoC embarks on a path of gradual rate tightening, the rising interest rate environment adds an additional level of uncertainty since elevated household indebtedness is a key risk. Increasing indebtedness could have material negative credit quality implications for our consumer lending portfolios, including residential mortgages, credit lines, indirect lending, credit cards, automotive lending and other personal loans.</p>
<p>Information Technology and Cyber Risks</p> 	<p>Information technology and cyber risks continue to be key risks, not only for the financial services sector, but for other industries in Canada and around the globe. The volume and sophistication of cyber-attacks continue to increase and could result in business interruptions, service disruptions, theft of intellectual property and confidential information, litigation and reputational damage. We continue to develop advancements in cyber defence capabilities in an effort to support our business model, protect our systems and enhance the experience of our clients on a global basis by employing industry best practices and collaborating with peers and experts to provide our customers with confidence in their financial transactions. The adoption of emerging technologies, such as cloud computing, artificial intelligence and robotics, call for continued focus and investment to manage our risks effectively.</p>
<p>Regulatory Changes</p> 	<p>We operate in multiple jurisdictions, and the continued expansion of the breadth and depth of regulations may lead to declining profitability and slower response to market needs. Financial reforms coming on stream in multiple jurisdictions may have material impacts on our businesses and could affect their strategies.</p>

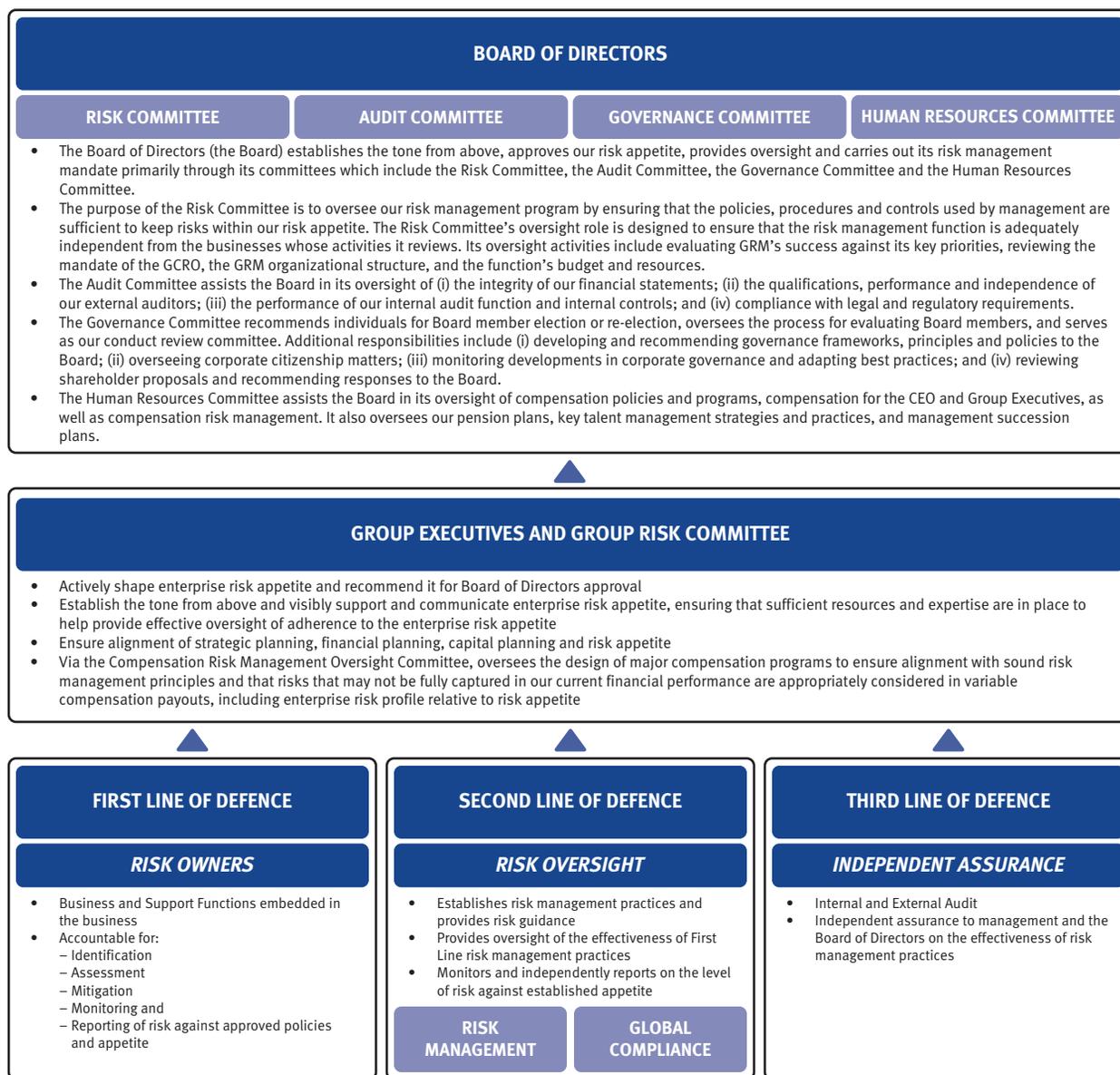
An emerging risk is one that could materially impact our financial results, reputation, business model, or strategy, but is not well understood and has not yet materialized. We are actively monitoring our emerging risks, which include the following:

- Technological innovation and non-traditional competitors;
- Global environmental policy and climate change;
- Changes in consumer behavior;
- End of quantitative easing and the implication for global liquidity.

Under the oversight of the Board of Directors and senior management, the Enterprise Risk Management Framework provides an overview of our enterprise-wide programs for managing risk, including identifying, assessing, measuring, controlling, monitoring and reporting on the significant risks that face the organization. While our risk appetite encompasses “what” risks we are able and willing to take, our risk conduct and culture articulates “how” we expect to take those risks.

Risk governance

The risk governance model is well-established. The Board of Directors oversees the implementation of our risk management framework, while employees at all levels of the organization are responsible for managing the day-to-day risks that arise in the context of their mandate. As shown below, we use the three lines of defence governance model to manage risks across the enterprise.



Risk appetite

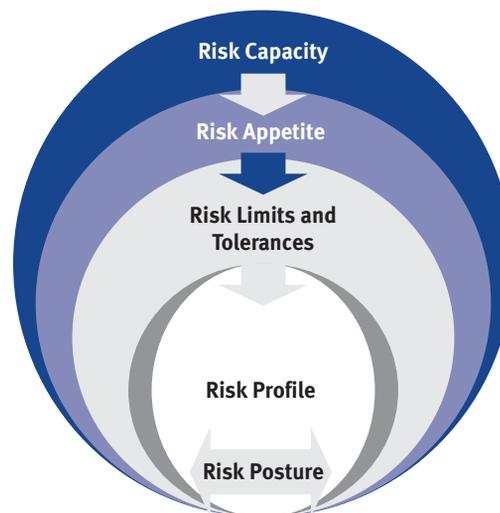
Our risk appetite is the amount and type of risk that we are able and willing to accept in the pursuit of our business objectives. The goal in managing risk is to protect us from an unacceptable loss or an undesirable outcome with respect to earnings volatility, capital adequacy or liquidity, while supporting and enabling our overall business strategy.

Our approach to articulating our risk appetite is focused around three key concepts:

1. The amount of “earnings at risk” that is determined to be acceptable over an economic cycle and including periods of moderate stress, using an expected future loss lens and considering potential revenue and expense contributions to earnings volatility;
2. The amount of “capital at risk” that is determined to be acceptable under severe and very severe stress, using an unexpected future loss lens; and
3. Ensuring adequate liquidity in times of stress.

Our Enterprise Risk Appetite Framework has several major components as follows:

- Define our risk capacity by identifying regulatory constraints that restrict our ability to accept risk.
- Establish and regularly confirm our risk appetite, comprised of strategic drivers and self-imposed constraints that define the maximum amount of risk we are willing to accept given our financial strength, corporate objectives and business strategies.
- Set risk limits and tolerances for management to ensure that risk-taking activities are within our risk appetite.
- Regularly measure and evaluate our risk profile, representing the risks we are exposed to, relative to our risk appetite, and ensure appropriate action is taken to prevent our risk profile from surpassing our risk appetite.
- Assess our risk posture to confirm whether our strategic priorities entail taking on more risk over a one-year time frame, using a scale of contracting, stable or expanding.



We are in the business of taking risk; however, we balance the risk-reward trade-off to ensure the long-term viability of the organization by remaining within our risk appetite. Our risk appetite is articulated in several complementary qualitative and quantitative risk appetite statements.

Risk Appetite Statements	
Qualitative Statements	Quantitative Statements
<ul style="list-style-type: none"> • Undertake only risks we understand. Make thoughtful and future-focused risk decisions. • Make decisions that balance risk with sustainable and stable business growth. • Maintain a healthy control environment to protect our stakeholders and meet regulatory and legal requirements. • Avoid activities that compromise our Purpose, Vision, Values, Goals and Code of Conduct. • Never compromise our reputation and the trust of our clients for profits. • Maintain financial resilience and operational readiness for extreme events, to protect our stakeholders, financial markets and the broader economy. 	<ul style="list-style-type: none"> • Manage exposure to future losses and volatility of earnings. • Avoid excessive concentrations of risk. • Maintain low exposure to future losses under periods of stress. • Ensure sound management of liquidity and funding risk. • Ensure sound management of regulatory compliance risk and operational risk. • Ensure capital adequacy by maintaining capital ratios in excess of rating agency and regulatory expectations. • Maintain strong credit ratings and risk profile in the top half of our peer group.

Our risk appetite statements are structured in such a way that they can be applied at the enterprise, business segment, business unit and legal entity levels. Risk appetite is aligned with our business strategies, capital, financial and funding plans. We also ensure that the business strategy aligns with the enterprise and business segment level risk appetite.

Risk measurement

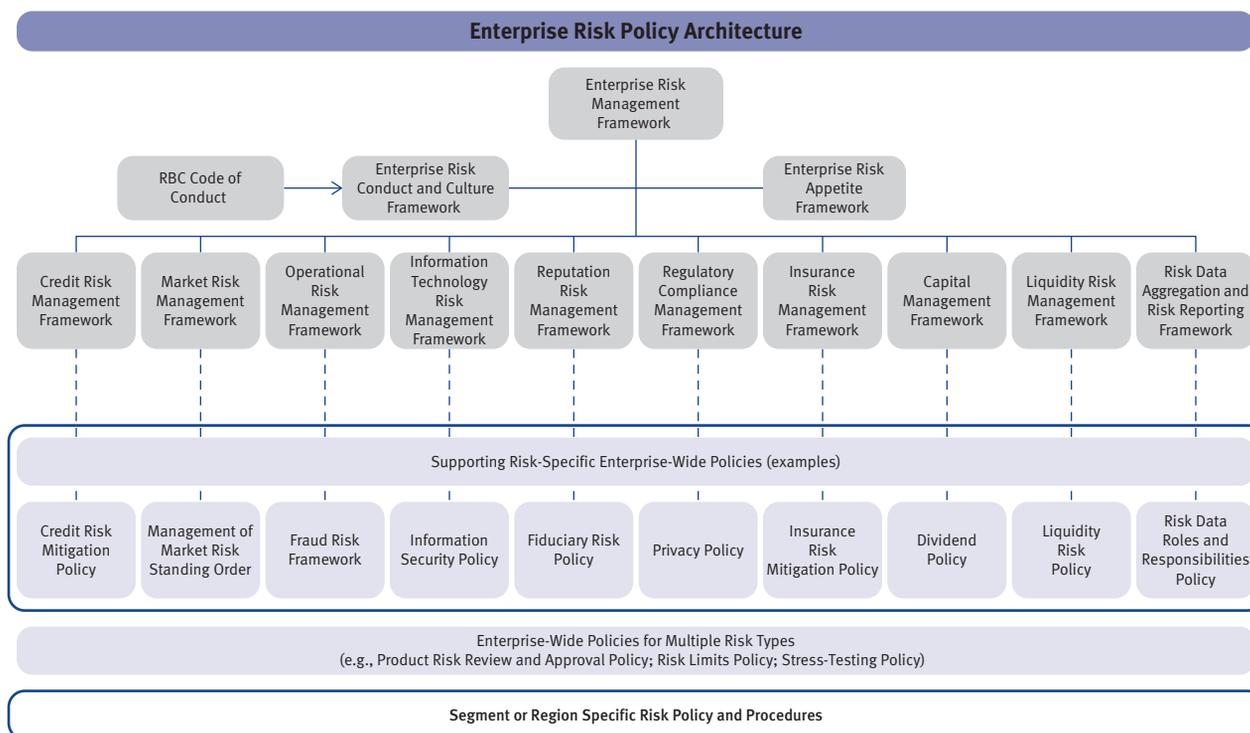
Our ability to measure risks is a key component of our enterprise-wide risk and capital management processes. Certain measurement methodologies are common to a number of risk types, while others only apply to a single risk type. While quantitative risk measurement is important, we also place reliance on qualitative factors. For those risk types that are difficult to quantify, we place greater emphasis on qualitative risk factors and assessment of activities to gauge the overall level of risk to ensure that they are within our risk appetite. In addition, judgmental risk measures are developed, and techniques such as stress testing, and scenario and sensitivity analyses can also be used to assess and measure risks. Our primary methods for measuring risk include:

- *Quantifying expected loss* which is used to assess earnings at risk and is a representation of losses that are statistically expected to occur in the normal course of business in a given time period;
- *Quantifying unexpected loss* which is used to assess capital at risk under stressed conditions and is a statistical estimate of the amount by which actual earnings depart from the expected, over a specified time horizon;
- *Stress testing* which examines potential impacts arising from exceptional but plausible events; and
- *Backtesting* which is performed on a quarterly basis by comparing the realized values to the parameter estimates that are currently used to ensure the parameters remain appropriate for regulatory and economic capital calculations.

Risk control

Our enterprise-wide risk management approach is supported by a comprehensive set of risk controls.

These risk controls are defined in our Enterprise Risk Management and Risk-Specific Frameworks, which lay the foundation for the development and communication of policies, establishment of formal risk review and approval processes, and the establishment of delegated authorities and limits. The implementation of robust risk controls enables the optimization of risk and return on both a portfolio and a transactional basis.



The approval hierarchy for risk frameworks and policy documents:

- Board of Directors or Board Committees**
- Senior Management Committees** (e.g., Policy Review Committee, Asset Liability Committee) for most policies. Board or Board Committee approval is required in some instances (e.g., RBC Code of Conduct, Dividend Policy)
- Generally within businesses or Corporate support Committees.** Group Risk Management approval required if there are significant risk implications

Risk review and approval processes

Risk review and approval processes are established by GRM based on the nature, size and complexity of the risk involved. In general, the risk review and approval process involves a formal review and approval by an individual, group or committee that is independent from the originator. The approval responsibilities are governed by delegated authorities based on the following categories: transactions, structured credit, projects and initiatives, and new products and services.

Authorities and limits

The Risk Committee of the Board of Directors delegates credit, market and insurance risk authorities to the President & Chief Executive Officer (CEO) and the Group Credit Risk Officer (GCRO). The delegated authorities allow these officers to approve single name, geographic (country and region) and industry sector exposures within defined parameters to manage concentration risk, establish underwriting and inventory limits for trading and investment banking activities and set market risk tolerances.

The Board of Directors also delegates liquidity risk authorities to the President & CEO, Chief Financial Officer (CFO) and GCRO. These limits act as a key risk control designed to ensure that reliable and cost-effective sources of cash or its equivalent are available to satisfy our current and prospective commitments.

Reporting

Enterprise and business segment level risk monitoring and reporting are critical components of our enterprise risk management program and support the ability of senior management and the Board of Directors to effectively perform their risk management and oversight responsibilities. In addition, we publish a number of external reports on risk matters to comply with regulatory requirements. On a quarterly basis, we provide to senior management and the Board of Directors the Enterprise Risk Report which includes a comprehensive review of our risk profile relative to our risk appetite, concentrations and limit usage, stress testing results, portfolio quality and focuses on the range of risks we face along with an analysis of the related issues and trends. On an annual basis, we provide a benchmarking review which compares our performance to peers across a variety of risk metrics and includes a composite risk scorecard providing an objective measure of our ranking relative to the peer group. In addition to our regular risk monitoring, other risk specific presentations are provided to and discussed with senior management and the Board of Directors on top and emerging risks or changes in our risk profile.

Stress testing

Stress testing examines potential impacts arising from exceptional but plausible adverse events, and is an important component of our risk management framework. Stress testing results are used in:

- Monitoring our risk profile relative to our risk appetite in terms of earnings and capital at risk;
- Setting limits;

- Identifying key risks to and potential shifts in our capital and liquidity levels, and our financial position;
- Enhancing our understanding of available mitigating actions in response to adverse events; and
- Assessing the adequacy of our target capital and liquidity levels.

Our enterprise-wide stress tests evaluate key balance sheet, income statement, leverage, capital, and liquidity impacts arising from risk exposures and changes in earnings. The results are used by the Group Risk Committee (GRC), the Board of Directors and senior management risk committees to understand our performance drivers under stress, and review stressed capital, leverage, and liquidity ratios against regulatory thresholds and internal targets. The results are also incorporated into our Internal Capital Adequacy Assessment Process (ICAAP) and capital plan analyses.

We annually evaluate a number of enterprise-wide stress scenarios over a multi-year horizon, featuring a range of severities. Our Board of Directors reviews the recommended scenarios, and GRM leads the scenario assessment process. Results from across the organization are integrated to develop an enterprise-wide view of the impacts, with input from subject matter experts in GRM, Corporate Treasury, Finance, and Economics. Recent scenarios evaluated include global recessions, protectionism, isolationism, and real estate price corrections, as well as credit spread and commodity shocks.

Ongoing stress testing and scenario analyses within specific risk types such as market risk, liquidity risk, structural interest rate risk, retail and wholesale credit risk, operational risk, and insurance risk supplement and support our enterprise-wide analyses. Results from these risk-specific programs are used in a variety of decision-making processes including risk limit setting, portfolio composition evaluation, risk appetite articulation, and business strategy implementation.

In addition to ongoing enterprise-wide and risk specific stress testing programs, we also use ad hoc and reverse stress testing to deepen our knowledge of the risks we face. Ad hoc stress tests are one-off analyses used to investigate developing conditions or stress a particular portfolio in more depth. Reverse stress tests, starting with a severe outcome and aiming to reverse-engineer scenarios that might lead to it, are used in risk identification and understanding of risk/return boundaries.

In addition to internal stress tests, we participate in a number of regulator-required stress test exercises, on a periodic basis, across several jurisdictions.

Risk conduct and culture

We define our risk conduct and culture as a shared set of behavioural norms that sustain our core values and enables us to proactively identify, understand and act upon our risks, thereby protecting our clients, safeguarding our shareholders' value, and supporting the integrity, soundness and resilience of financial markets.

Risk behaviour expectations are in place and articulated through:

- Our Values;
- Code of Conduct;
- Risk management principles;
- Risk appetite statements;
- Regulatory conduct rules, practices and policies;
- Performance management processes; and
- The Risk Conduct and Culture Framework.

We align with the Financial Stability Board's four fundamental Risk Culture practices. Our Risk Culture practices include:

- Tone from above;
- Accountability;
- Effective challenge; and
- Incentives and performance management.

These practices are largely grounded in our existing risk management and human resource disciplines and protocols, and, when combined with the elements of effective leadership and values, provide a base from which the resulting risk conduct and culture can be assessed, monitored, sustained and subject to ongoing enhancement.

We hold ourselves to the highest standards of conduct to build the trust of our clients, investors, colleagues and community. The desired outcomes from effective risk conduct and culture practices align with our values and support our risk appetite statements:



The shaded text along with the tables specifically marked with an asterisk (*) in the following sections of the MD&A represent our disclosures on credit, market and liquidity and funding risks in accordance with IFRS 7, *Financial Instruments: Disclosures*, and include discussion on how we measure our risks and the objectives, policies and methodologies for managing these risks. Therefore, these shaded text and marked tables represent an integral part of our 2017 Annual Consolidated Financial Statements.

Credit risk is the risk of loss associated with an obligor's potential inability or unwillingness to fulfill its contractual obligations on a timely basis. Credit risk may arise directly from the risk of default of a primary obligor (e.g., issuer, debtor, counterparty, borrower or policyholder), or indirectly from a secondary obligor (e.g., guarantor or reinsurer). Credit risk includes counterparty credit risk from both trading and non-trading activities.

The responsibility for managing credit risk is shared broadly following the three lines of defence governance model. The Board of Directors, through its Risk Committee, delegates credit risk approval authorities to the President & CEO and GCRO. Credit transactions in excess of these authorities must be approved by the Risk Committee. To facilitate day-to-day business operations, the GCRO has been empowered to further delegate credit risk approval authorities to individuals within GRM, the business segments, and Corporate Support as necessary.

We balance our risk and return by setting the following objectives for the management of credit risk:

- Ensuring credit quality is not compromised for growth;
- Mitigating credit risks in transactions, relationships and portfolios;
- Using RBC's credit risk rating and scoring systems or other approved credit risk assessment or rating methodologies, policies and tools;
- Pricing appropriately for the credit risk taken;
- Detecting and preventing inappropriate credit risk through effective systems and controls;
- Applying consistent credit risk exposure measurements;
- Ongoing credit risk monitoring and administration;
- Transferring credit risk to third parties where appropriate through approved credit risk mitigation techniques (e.g., sale, hedging, insurance, securitization); and
- Avoiding activities that are inconsistent with RBC's Values, Code of Conduct or policies.

We maintain a Credit Risk Framework and supporting policies that are designed to clearly define roles and responsibilities, acceptable practices, limits and key controls. The Credit Risk Framework describes the principles, methodologies, systems, roles and responsibilities, reports and controls that exist for managing credit risk within RBC.

Credit risk measurement

We quantify credit risk, at both the individual obligor and portfolio levels, to manage expected credit losses in order to limit earnings volatility and minimize unexpected losses.

We employ a variety of risk measurement methodologies to measure and quantify credit risk for our wholesale and retail credit portfolios. The wholesale portfolio is comprised of businesses, sovereigns, public sector entities, banks and other financial institutions, as well as certain individuals and small businesses. The retail portfolio is comprised of residential mortgages, personal loans, credit cards, and small business loans. Our credit risk rating systems are designed to assess and quantify the risk inherent in credit activities in an accurate and consistent manner. The resulting ratings and scores are then used for both client- and transaction-level risk decision making and as key inputs for our risk measurement and capital calculations.

Measurement of regulatory and economic capital

In measuring credit risk to determine regulatory capital, two principal approaches are available: Internal Ratings Based Approach (IRB) and Standardized Approach. Most of our credit risk exposure is measured under the IRB.

Under the Standardized Approach, used primarily for our Caribbean banking operations and City National, risk weights prescribed by the OSFI are used to calculate risk-weighted assets (RWA) for credit risk exposure.

Economic capital, which is our internal quantification of risks, is used for performance measurement, limit setting and internal capital adequacy.

The key parameters that form the basis of our credit risk measures for both regulatory and economic capital are:

- Probability of default (PD): An estimated percentage that represents the likelihood of default within a given time period of an obligor for a specific rating grade or for a particular pool of exposure.
- Exposure at default (EAD): An amount expected to be owed by an obligor at the time of default.
- Loss given default (LGD): An estimated percentage of EAD that is not expected to be recovered during the collections and recovery process.

These parameters are determined based primarily on historical experience from internal credit risk rating systems in accordance with supervisory standards, and are independently validated and updated on a regular basis.

Each credit facility is assigned an LGD rate that is largely driven by factors that impact the extent of losses anticipated in the event the obligor defaults. These factors mainly include seniority of debt, collateral security, and the industry sector in which the obligor operates. Estimated LGD rates draw primarily on internal loss experience. Where we have limited internal loss data, we also refer to appropriate external data to supplement the estimation process. LGD rates are estimated to reflect conditions that might be expected to prevail in a period of an economic downturn, with additional conservatism added to reflect data limitations and statistical uncertainties identified in the estimation process.

EAD is estimated based on the current exposure to the obligor and the possible future changes in that exposure driven by factors such as the nature of the credit commitment. As with LGD, rates are estimated to reflect an economic downturn, with added conservatism to reflect data and statistical uncertainties identified in the modelling process.

Estimates of PD, LGD and EAD are updated, and then validated and back-tested by an independent validation team within the bank, on an annual basis. In addition, quarterly monitoring and back-testing is performed by the estimation team. These ratings and risk measurements are used to determine our expected losses as well as economic and regulatory capital, setting of risk limits, portfolio management and product pricing.

Gross credit risk exposure

Gross credit risk exposure is calculated based on the definitions provided under the Basel III framework. Under this method, EAD is calculated before taking into account any collateral and is inclusive of an estimate of potential future changes to that credit exposure. Gross credit risk is categorized into either lending-related and other, or trading-related.

Lending-related and other includes:

- Loans and acceptances outstanding, undrawn commitments, and other exposures, including contingent liabilities such as letters of credit and guarantees, available-for-sale (AFS) debt securities and deposits with financial institutions. Undrawn commitments represent an estimate of the contractual amount that may be drawn upon at the time of default of an obligor.

Trading-related credit includes:

- Repo-style transactions, which include repurchase and reverse repurchase agreements and securities lending and borrowing transactions. For repo-style transactions, gross exposure represents the amount at which securities were initially financed, before taking into account collateral.
- Derivative amounts which represent the credit equivalent amount, defined by OSFI as the replacement cost plus an add-on amount for potential future credit exposure.

Credit risk assessment

Wholesale credit risk

The wholesale credit risk rating system is designed to measure the credit risk inherent in our wholesale credit activities.

Each obligor is assigned a borrower risk rating (BRR), reflecting an assessment of the credit quality of the obligor. Each BRR has a PD calibrated against it. The BRR differentiates the riskiness of obligors and represents our evaluation of the obligor's ability and willingness to meet its contractual obligations on time over a three year time horizon. The assignment of BRRs is based on the evaluation of the obligor's business risk and financial risk and is based on fundamental credit analysis. The determination of the PD associated with each BRR relies primarily on internal default history since the early 2000s. PD estimates are designed to be a conservative reflection of our experience across the economic cycle including periods of economic downturn.

Our rating system is designed to stratify obligors into 22 grades. The following table aligns the relative rankings of our 22-grade internal risk ratings with the ratings used by S&P and Moody's.

Ratings	PD Bands	BRR	S&P	Moody's	Description
1	0.009%	1+	AAA	Aaa	Investment Grade
2	0.013%	1H	AA+	Aa1	
3	0.025%	1M	AA	Aa2	
4	0.028%	1L	AA-	Aa3	
5	0.045%	2+H	A+	A1	
6	0.066%	2+M	A	A2	
7	0.086%	2+L	A-	A3	
8	0.168%	2H	BBB+	Baa1	
9	0.205%	2M	BBB	Baa2	
10	0.268%	2L	BBB-	Baa3	
11	0.434%	2-H	BB+	Ba1	Non-investment Grade
12	0.702%	2-M	BB	Ba2	
13	1.135%	2-L	BB-	Ba3	
14	2.288%	3+H	B+	B1	
15	3.701%	3+M	B	B2	
16	5.985%	3+L	B-	B3	
17	9.680%	3H	CCC+	Caa1	
18	12.556%	3M	CCC	Caa2	
19	20.306%	3L	CCC-	Caa3	
20	32.840%	4	CC	Ca	
21	100%	5	C	C	Impaired
22	100%	6	Bankruptcy	Bankruptcy	

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

Counterparty credit risk

Counterparty credit risk is the risk that a party with whom the bank has entered into a financial or non-financial contract will fail to fulfill its contractual agreement and default on the obligation. It is measured not only by its current value, but also by how this value can move as market conditions change. Counterparty credit risk usually occurs in trading-related derivative and repo-style transactions. Derivative transactions include financial (e.g., forwards, futures, swaps and options) and non-financial (e.g., precious metal and commodities) derivatives. For further details on our derivative instruments and credit risk mitigation, refer to Note 8 of our 2017 Annual Consolidated Financial Statements.

Wrong-way risk

Wrong-way risk is the risk that exposure to a counterparty or obligor is adversely correlated with the credit quality of that counterparty. There are two types of wrong-way risk:

- Specific Wrong-Way Risk, which exists when our exposure to a particular counterparty is positively and highly correlated with the probability of default of the counterparty due to the nature of our transactions with them (e.g., loan collateralized by shares or debt issued by the counterparty or a related party); and

- General Wrong-Way Risk, which exists when there is a positive correlation between the probability of default of counterparties and general macroeconomic or market factors. This typically occurs with derivatives (e.g., the size of the exposure increases) or with collateralized transactions (e.g., the value of the collateral declines).

Retail credit risk

Credit scoring is the primary risk rating system for assessing obligor and transaction risk for retail exposures. Scoring models use internal and external data to assess and “score” borrowers, predict future performance and manage limits for existing loans and collection activities. Credit scores are one of the factors employed in the acquisition of new clients and management of existing clients. The credit score of the borrower is used to assess the predicted risk and revenue for each independent acquisition or account management action, leading to an automated decision or guidance for an adjudicator. Credit scoring improves credit decision quality, adjudication timeframes, consistency in the credit decision process and facilitates risk-based pricing.

Our retail risk rating system is two-dimensional, whereby assessment of internal ratings is based both on PD, which is a borrower risk dimension, and on LGD, which is a facility-specific risk dimension.

The following table maps PD bands to various risk levels:

Internal ratings map*		Table 47
PD bands	Description	
0.000% – 1.718%	Low risk	
1.719% – 6.430%	Medium risk	
6.431% – 99.99%	High risk	
100%	Impaired/Default	

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

Credit risk mitigation

Credit risk mitigation policies are an integral component of our Credit Risk Framework and set out the minimum requirements for the mitigation of credit risk.

Structuring of transactions

Specific credit policies and procedures set out the requirements for structuring transactions. Risk mitigants include the use of guarantees, collateral, seniority, loan-to-value requirements and covenants. Product-specific guidelines set out appropriate product structuring as well as client and guarantor criteria.

Collateral

We often require obligors to pledge collateral as security when we advance credit. The extent of risk mitigation provided by collateral depends on the amount, type and quality of the collateral taken. Specific requirements relating to collateral valuation and management are set out in our credit risk management policies. The types of collateral used to secure credit or trading facilities within the bank are varied. For example, the majority of our securities financing and over-the-counter (OTC) derivatives activities are secured by cash and liquid government securities such as Organisation for Economic Co-operation and Development (OECD) securities. Wholesale lending is often secured by pledges of the assets of a business, such as accounts receivable, inventory, operating assets and commercial real estate. In our Canadian Banking business and Wealth Management segment, collateral typically consists of a pledge over a real estate property, or a portfolio of debt securities and equities trading on a recognized exchange.

- We employ a risk-based approach to property valuation. Property valuation methods include automated valuation models (AVM) and appraisals. An AVM is a tool that estimates the value of a property by reference to market data including sales of comparable properties and price trends specific to the Metropolitan Statistical Area in which the property being valued is located. Using a risk-based approach, we also employ appraisals which can include drive-by or full on-site appraisals.
- We continue to actively manage our entire mortgage portfolio and perform stress testing, based on a combination of increasing unemployment, rising interest rates and a downturn in real estate markets.
- We are compliant with regulatory requirements that govern residential mortgage underwriting practices, including loan-to-value parameters and property valuation requirements.

Credit risk approval

The Board of Directors and its committees, the Group Executive (GE), the GRC and other senior management risk committees work together to ensure a Credit Risk Framework and supporting policies, processes and procedures exist to manage credit risk and approve related credit risk limits. Reports are distributed to the Board of Directors, the GRC, and senior executives to keep them informed of our risk profile, including trending information and significant credit risk issues and shifts in exposures to ensure appropriate actions can be taken where necessary. Our enterprise-wide credit risk policies set out the minimum requirements for the management of credit risk in a variety of borrower, transactional and portfolio management contexts.

Product approval

- Proposals for credit products and services are comprehensively reviewed and approved under a risk assessment framework. New, amended and existing products must be reviewed relative to all risks in our risk pyramid, including credit risk. All products must be reviewed on a periodic basis, with high risk products being reviewed more frequently.

Credit limits

- Concentration risk is defined as the risk arising from large exposures to borrowers aggregated under one or more single names, industry sectors, countries or credit products within a portfolio that are highly correlated such that their ability to meet contractual obligations could be similarly affected by changes in economic, political or other risk drivers.

- We manage credit exposures and limits to ensure alignment with our risk appetite, to maintain our target business mix and to ensure that there is no undue risk concentration. Credit concentration limits are reviewed on a regular basis after taking into account business, economic, financial and regulatory environments.
- Credit limits are established at the following levels: single name limits (notional and economic capital), underwriting risk limits, leveraged lending limits, geographic (country and region) limits (notional and economic capital), industry sector limits (notional and economic capital), and product and portfolio limits, where deemed necessary.

Credit risk administration

Credit provisioning and allowances

We maintain an Allowance for Credit Losses at an appropriate level to cover identified credit losses in the portfolio as well as losses for loans not yet identified as impaired. In determining the appropriate level of Allowance for Credit Losses, we utilize both quantitative and qualitative assessments using current and historical credit information in accordance with IAS 39 *Financial Instruments: Recognition and Measurement* (IAS 39).

Loan forbearance

In our overall management of borrower relationships, economic or legal reasons may necessitate forbearance to certain clients with respect to the original terms and conditions of their loans. We have specialized groups and formalized policies that direct the management of delinquent or defaulted borrowers. We strive to identify borrowers in financial difficulty early and modify their loan terms in order to maximize collection and to avoid foreclosure, repossession, or other legal remedies. In these circumstances, a borrower may be granted concessions that would not otherwise be considered. Examples of such concessions to retail borrowers may include rate reduction, principal forgiveness, and term extensions. Concessions to wholesale borrowers may include restructuring the agreements, modifying the original terms of the agreement and/or relaxation of covenants. For both retail and wholesale loans, the appropriate remediation techniques are based on the individual borrower's situation, RBC's policy and the customer's willingness and capacity to meet the new arrangement.

Gross credit risk exposure by portfolio, sector and geography*

Table 48

(Millions of Canadian dollars)	As at											
	October 31 2017						October 31 2016					
	Lending-related and other			Trading-related			Lending-related and other			Trading-related		
	Loans and acceptances						Loans and acceptances					
	Outstanding	Undrawn commitments (1)	Other (2)	Repo-style transactions	Derivatives (3)	Total exposure (4)	Outstanding	Undrawn commitments (1)	Other (2)	Repo-style transactions	Derivatives (3)	Total exposure (4)
By portfolio												
Residential mortgages	\$ 270,348	\$ 818	\$ 269	\$ –	\$ –	\$ 271,435	\$ 254,998	\$ 1,063	\$ 214	\$ –	\$ –	\$ 256,275
Personal	92,294	88,120	176	–	–	180,590	93,466	82,527	145	–	–	176,138
Credit cards	18,035	21,826	–	–	–	39,861	17,128	24,571	–	–	–	41,699
Small business (5)	4,493	6,888	6	–	–	11,387	3,878	6,188	5	–	–	10,071
Retail	\$ 385,170	\$ 117,652	\$ 451	\$ –	\$ –	\$ 503,273	\$ 369,470	\$ 114,349	\$ 364	\$ –	\$ –	\$ 484,183
Business (5)												
Agriculture	\$ 7,380	\$ 1,338	\$ 78	\$ –	\$ 63	\$ 8,859	\$ 6,515	\$ 1,310	\$ 74	\$ –	\$ 109	\$ 8,008
Automotive	8,248	6,026	376	–	417	15,067	7,279	5,785	567	–	497	14,128
Consumer goods	11,387	8,872	605	–	525	21,389	10,052	9,562	756	–	551	20,921
Energy												
Oil & Gas	6,743	10,322	1,810	–	960	19,835	6,259	10,747	1,656	–	1,198	19,860
Utilities	5,614	14,867	3,689	37	1,347	25,554	7,680	13,694	3,496	–	1,748	26,618
Financing products	6,556	2,062	425	730	628	10,401	8,840	2,649	421	494	611	13,015
Forest products	911	635	85	–	16	1,647	1,099	561	85	–	27	1,772
Health services	6,998	4,602	1,800	1	522	13,923	7,763	4,085	1,684	–	469	14,001
Holding and investments	8,803	929	566	–	203	10,501	7,195	2,270	637	–	279	10,381
Industrial products	5,581	7,533	447	–	692	14,253	5,508	7,757	546	–	632	14,443
Mining & metals	1,113	3,816	1,027	–	101	6,057	1,455	3,640	1,135	–	144	6,374
Non-bank financial services	10,744	14,263	15,597	329,214	38,477	408,295	8,408	13,149	15,830	249,732	41,381	328,500
Other services	14,757	7,529	4,024	950	654	27,914	11,582	9,848	10,049	1,410	1,525	34,414
Real estate & related	46,197	11,267	1,603	3	443	59,513	40,419	11,215	1,847	4	499	53,984
Technology & media	8,890	14,129	633	305	2,456	26,413	11,019	14,758	873	470	1,832	28,952
Transportation & environment	5,950	5,712	3,300	–	841	15,803	6,060	4,393	3,603	–	1,637	15,693
Other sectors	4,570	17	4,694	3,018	563	12,862	7,568	755	5,856	882	507	15,568
Sovereign (5)	11,362	11,406	110,581	35,228	14,356	182,933	10,581	6,972	84,017	38,707	17,319	157,596
Bank (5)	4,261	1,423	132,644	106,346	23,735	268,409	1,930	1,815	119,324	104,314	25,600	252,983
Wholesale	\$ 176,065	\$ 126,748	\$ 283,984	\$ 475,832	\$ 86,999	\$ 1,149,628	\$ 167,212	\$ 124,965	\$ 252,456	\$ 396,013	\$ 96,565	\$ 1,037,211
Total exposure	\$ 561,235	\$ 244,400	\$ 284,435	\$ 475,832	\$ 86,999	\$ 1,652,901	\$ 536,682	\$ 239,314	\$ 252,820	\$ 396,013	\$ 96,565	\$ 1,521,394
By geography (6)												
Canada	\$ 458,963	\$ 156,249	\$ 100,740	\$ 68,279	\$ 24,018	\$ 808,249	\$ 430,616	\$ 151,481	\$ 81,800	\$ 76,094	\$ 27,647	\$ 767,638
U.S.	73,137	64,439	79,782	258,883	14,333	490,574	76,481	69,006	81,168	208,759	14,315	449,729
Europe	13,979	17,934	80,319	87,158	43,312	242,702	14,886	15,367	74,547	71,722	48,318	224,840
Other International	15,156	5,778	23,594	61,512	5,336	111,376	14,699	3,460	15,305	39,438	6,285	79,187
Total Exposure	\$ 561,235	\$ 244,400	\$ 284,435	\$ 475,832	\$ 86,999	\$ 1,652,901	\$ 536,682	\$ 239,314	\$ 252,820	\$ 396,013	\$ 96,565	\$ 1,521,394

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

- (1) Undrawn commitments represent an estimate of the contractual amount that may be drawn upon at the time of default of an obligor.
- (2) Includes credit equivalent amounts for contingent liabilities such as letters of credit and guarantees, outstanding amounts for AFS debt securities, deposits with financial institutions and other assets.
- (3) Credit equivalent amount after factoring in master netting agreements.
- (4) Gross credit risk exposure is before allowance for loan losses. Exposures under Basel III asset classes of qualifying revolving retail and other retail are largely included within Personal and Credit cards, while home equity lines of credit are included in Personal.
- (5) For further information, refer to Note 5 of our 2017 Annual Consolidated Financial Statements.
- (6) Geographic profile is based on country of residence of the borrower.

2017 vs. 2016

Total gross credit risk exposure increased \$132 billion or 9% from last year, primarily due to growth in repo-style transactions, cash and due from banks, interest-bearing deposits with banks, as well as loans & acceptances. These increases were partially offset by a decrease in derivative exposures and the impact of foreign exchange translation.

Retail exposure increased \$19 billion or 4%, largely driven by volume growth in residential mortgages and personal loans, partially offset by a decrease in credit cards related to undrawn commitments.

Wholesale exposure increased \$112 billion or 11%, primarily attributable to growth in repo-style transactions, cash and due from banks, interest-bearing deposits with banks largely reflecting higher deposits with central banks, as well as loans and acceptances. These increases were partially offset by a decrease in derivative exposures and the impact of foreign exchange translation. Wholesale loan utilization remained stable compared to the prior year at 39%.

The geographic mix of our gross credit risk exposure remained relatively unchanged from the prior year. Our exposure in Canada, the U.S., Europe and Other International was 49%, 30%, 15% and 6%, respectively (October 31, 2016 – 50%, 30%, 15% and 5%, respectively).

Our exposure in Canada increased \$41 billion or 5% compared to the prior year, primarily due to growth in business loans and acceptances, and residential mortgages.

Our exposure in the U.S. increased \$41 billion or 9% compared to the prior year, mainly due to repo-style transactions largely attributable to higher client and business activities, partially offset by the impact of foreign exchange translation.

Our exposure in Europe increased \$18 billion or 8% compared to the prior year, primarily due to growth in repo-style transactions and increased deposits with central banks.

Our exposure in Other International increased \$32 billion or 41% compared to the prior year, primarily due to growth in repo style transactions and increased deposits with central banks.

Loans and acceptances outstanding and undrawn commitments* (1)

Table 49

(Millions of Canadian dollars)	As at												
	October 31 2017						October 31 2016 (2)						
	Low risk	Medium risk	High risk	Impaired	Standardized and Non-Rated	Total	Low risk (3)	Medium risk	High risk	Impaired (3)	Standardized and Non-Rated (3), (4)	Total	
Retail (5)													
Residential mortgages	\$ 221,911	\$ 12,388	\$ 2,383	\$ 284	\$ 34,200	\$ 271,166	\$ 209,532	\$ 12,750	\$ 2,090	\$ 337	\$ 22,197	\$ 246,906	
Personal	161,484	12,238	2,736	193	3,763	180,414	158,498	10,624	2,768	222	1,421	173,533	
Credit cards	31,883	5,320	1,396	–	1,262	39,861	34,116	5,342	1,437	–	642	41,537	
Small business	7,770	1,908	433	31	1,239	11,381	5,822	1,201	1,671	36	1,336	10,066	
	\$ 423,048	\$ 31,854	\$ 6,948	\$ 508	\$ 40,464	\$ 502,822	\$ 407,968	\$ 29,917	\$ 7,966	\$ 595	\$ 25,596	\$ 472,042	

(Millions of Canadian dollars)	As at							
	October 31 2017				October 31 2016 (2)			
	Investment grade	Non-investment grade	Impaired	Total	Investment grade	Non-investment grade	Impaired	Total
Wholesale (6)								
Business	\$ 108,733	\$ 164,256	\$ 1,372	\$ 274,361	\$ 107,510	\$ 132,967	\$ 2,339	\$ 242,816
Sovereign	21,457	1,311	–	22,768	15,939	786	–	16,725
Bank	3,519	2,165	–	5,684	1,881	943	2	2,826
Total	\$ 133,709	\$ 167,732	\$ 1,372	\$ 302,813	\$ 125,330	\$ 134,696	\$ 2,341	\$ 262,367

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

- (1) This table represents our retail and wholesale loans and acceptances outstanding and undrawn commitments by portfolio and risk category. The amounts in the table are before allowance for impaired loans.
- (2) City National exposures of \$41.6 billion are excluded as at October 31, 2016.
- (3) Amounts have been revised from those previously presented.
- (4) Under the standardized approach, credit risk exposure is based on risk weights prescribed by OSFI.
- (5) Includes undrawn commitments of \$1.0 billion, \$88.1 billion, \$21.8 billion, and \$6.9 billion for Residential mortgages, Personal, Credit cards and Small business, respectively (October 31, 2016 – \$1.0 billion, \$82.4 billion, \$24.6 billion and \$6.2 billion, respectively).
- (6) Includes undrawn commitments of \$113.9 billion, \$11.4 billion, and \$1.4 billion for Business, Sovereign and Bank, respectively (October 31, 2016 – \$111.3 billion, \$7.0 billion, and \$1.2 billion, respectively).

2017 vs. 2016

Growth in retail exposures was largely attributable to volume growth in residential mortgages and personal loans. Growth in wholesale exposures mainly reflects increased volumes in non-investment grade categories across various industry sectors, slightly offset by the impact of foreign exchange.

(Millions of Canadian dollars)	October 31 2017									October 31 2016
	Asset type				Client type				Total	Total
	Loans Outstanding	Securities (3)	Repo-style transactions	Derivatives	Financials	Sovereign	Corporate			
U.K.	\$ 7,925	\$ 10,428	\$ 909	\$ 1,241	\$ 8,050	\$ 4,871	\$ 7,582	\$ 20,503	\$ 17,956	
Germany	1,626	12,308	1	260	6,686	5,001	2,508	14,195	11,273	
France	615	9,650	2	453	1,909	8,249	562	10,720	8,398	
Total U.K., Germany, France	\$ 10,166	\$ 32,386	\$ 912	\$ 1,954	\$ 16,645	\$ 18,121	\$ 10,652	\$ 45,418	\$ 37,627	
Ireland	\$ 412	\$ 30	\$ 100	\$ 44	\$ 142	\$ 12	\$ 432	\$ 586	\$ 880	
Italy	105	116	–	5	143	9	74	226	120	
Portugal	–	16	–	1	1	–	16	17	16	
Spain	359	404	–	14	408	–	369	777	446	
Total Peripheral (4)	\$ 876	\$ 566	\$ 100	\$ 64	\$ 694	\$ 21	\$ 891	\$ 1,606	\$ 1,462	
Luxembourg (5)	\$ 939	\$ 5,541	\$ 2	\$ 85	\$ 507	\$ 5,029	\$ 1,031	\$ 6,567	\$ 6,054	
Netherlands (5)	895	2,304	26	246	2,493	–	978	3,471	3,904	
Norway	239	4,169	–	5	3,889	247	277	4,413	3,945	
Sweden	109	4,599	5	13	3,017	1,585	124	4,726	4,168	
Switzerland	413	2,813	168	139	847	2,579	107	3,533	2,271	
Other	1,262	2,160	7	81	735	1,601	1,174	3,510	2,982	
Total Other Europe	\$ 3,857	\$ 21,586	\$ 208	\$ 569	\$ 11,488	\$ 11,041	\$ 3,691	\$ 26,220	\$ 23,324	
Net exposure to Europe (6), (7)	\$ 14,899	\$ 54,538	\$ 1,220	\$ 2,587	\$ 28,827	\$ 29,183	\$ 15,234	\$ 73,244	\$ 62,413	

- (1) Geographic profile is based on country of risk, which reflects our assessment of the geographic risk associated with a given exposure. Typically, this is the residence of the borrower.
- (2) Exposures are calculated on a fair value basis and net of collateral, which includes \$77.7 billion against repo-style transactions (October 31, 2016 – \$64.0 billion) and \$12.6 billion against derivatives (October 31, 2016 – \$15.7 billion).
- (3) Securities include \$20.0 billion of trading securities (October 31, 2016 – \$11.1 billion), \$19.7 billion of deposits (October 31, 2016 – \$12.3 billion), and \$14.8 billion of AFS securities (October 31, 2016 – \$15.9 billion).
- (4) Gross credit risk exposure to peripheral Europe is comprised of Ireland \$19.3 billion (October 31, 2016 – \$18.9 billion), Italy \$0.4 billion (October 31, 2016 – \$0.3 billion), Portugal \$nil (October 31, 2016 – \$0.1 billion), and Spain \$1.0 billion (October 31, 2016 – \$1.1 billion).
- (5) Amounts have been revised from those previously presented.
- (6) Excludes \$2.7 billion (October 31, 2016 – \$1.9 billion) of exposures to supranational agencies.
- (7) Reflects \$1.4 billion of mitigation through credit default swaps, which are largely used to hedge single name exposures and market risk (October 31, 2016 – \$1.5 billion).

2017 vs. 2016

Net credit risk exposure to Europe increased \$10.8 billion from last year, largely driven by increased exposure to Germany, U.K., France, and Switzerland. Our net exposure to peripheral Europe, which includes Ireland, Italy, Portugal and Spain remained minimal, with total outstanding exposure increasing \$0.1 billion during the year to \$1.6 billion.

Our European corporate loan book is managed on a global basis with underwriting standards reflecting the same approach to the use of our balance sheet as we have applied in both Canada and the U.S. PCL taken on this portfolio during the year was not material. The gross impaired loans ratio of this loan book was 100 bps, slightly down from 110 bps in the prior year.

Residential mortgages and home equity lines of credit (insured vs. uninsured)

Residential mortgages and home equity lines of credit are secured by residential properties. The following table presents a breakdown by geographic region:

Residential mortgages and home equity lines of credit **Table 51**

(Millions of Canadian dollars, except percentage amounts)	As at October 31, 2017					
	Residential mortgages (1)					Home equity lines of credit (2)
	Insured (3)		Uninsured		Total	Total
	Region (4)					
Canada						
Atlantic provinces	\$ 7,670	57%	\$ 5,848	43%	\$ 13,518	\$ 1,986
Quebec	15,089	48	16,557	52	31,646	3,964
Ontario	42,610	39	66,549	61	109,159	16,823
Alberta	21,820	58	15,702	42	37,522	6,950
Saskatchewan and Manitoba	9,305	54	7,932	46	17,237	2,627
B.C. and territories	17,169	37	29,521	63	46,690	8,620
Total Canada (5)	\$ 113,663	44%	\$ 142,109	56%	\$ 255,772	\$ 40,970
U.S.	1	–	11,448	100	11,449	1,557
Other International	9	–	3,091	100	3,100	1,992
Total International	\$ 10	–%	\$ 14,539	100%	\$ 14,549	\$ 3,549
Total	\$ 113,673	42%	\$ 156,648	58%	\$ 270,321	\$ 44,519

(Millions of Canadian dollars, except percentage amounts)	As at October 31, 2016					
	Residential mortgages (1)					Home equity lines of credit (2)
	Insured (3)		Uninsured		Total	Total
	Region (4)					
Canada						
Atlantic provinces	\$ 7,633	59%	\$ 5,409	41%	\$ 13,042	\$ 2,034
Quebec	14,432	50	14,429	50	28,861	4,060
Ontario	43,314	43	58,016	57	101,330	16,512
Alberta	21,746	58	15,429	42	37,175	7,066
Saskatchewan and Manitoba	8,897	54	7,730	46	16,627	2,682
B.C. and territories	17,657	40	27,024	60	44,681	8,739
Total Canada (5)	\$ 113,679	47%	\$ 128,037	53%	\$ 241,716	\$ 41,093
U.S.	2	–	10,012	100	10,014	1,464
Other International	13	–	3,171	100	3,184	2,442
Total International	\$ 15	–%	\$ 13,183	100%	\$ 13,198	\$ 3,906
Total	\$ 113,694	45%	\$ 141,220	55%	\$ 254,914	\$ 44,999

(1) The residential mortgages amounts exclude our third-party mortgage-backed securities (MBS) of \$27 million (2016 – \$84 million).

(2) Home equity lines of credit include revolving and non-revolving loans.

(3) Insured residential mortgages are mortgages whereby our exposure to default is mitigated by insurance through the Canada Mortgage and Housing Corporation (CMHC) or other private mortgage default insurers.

(4) Region is based upon address of the property mortgaged. The Atlantic provinces are comprised of Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick, and B.C. and territories are comprised of British Columbia, Nunavut, Northwest Territories and Yukon.

(5) Total consolidated residential mortgages in Canada of \$256 billion (2016 – \$242 billion) is largely comprised of \$231 billion (2016 – \$217 billion) of residential mortgages and \$6 billion (2016 – \$6 billion) of mortgages with commercial clients, of which \$4 billion (2016 – \$3 billion) are insured mortgages, both in Canadian Banking, and \$19 billion (2016 – \$19 billion) of residential mortgages in Capital Markets held for securitization purposes.

Home equity lines of credit are uninsured and reported within the personal loan category. As at October 31, 2017, home equity lines of credit in Canadian Banking were \$41 billion (2016 – \$41 billion). Approximately 98% of these home equity lines of credit (2016 – 98%) are secured by a first lien on real estate, and only 7% (2016 – 7%) of the total homeline clients pay the scheduled interest payment only.

Residential mortgages portfolio by amortization period

The following table provides a summary of the percentage of residential mortgages that fall within the remaining amortization periods based upon current customer payment amounts, which incorporate payments larger than the minimum contractual amount and/or higher frequency of payments:

Residential mortgages portfolio by amortization period				Table 52		
Amortization period	As at					
	October 31 2017			October 31 2016		
	Canada	U.S. and Other International	Total	Canada	U.S. and Other International	Total
≤ 25 years	73%	43%	71%	74%	40%	72%
> 25 years ≤ 30 years	24	57	26	25	58	27
> 30 years ≤ 35 years	3	–	3	1	2	1
Total	100%	100%	100%	100%	100%	100%

Average loan-to-value (LTV) ratio for newly originated and acquired uninsured residential mortgages and homeline products

The following table provides a summary of our average LTV ratio for newly originated and acquired uninsured residential mortgages and homeline products by geographic region:

Average LTV ratio		Table 53			
	October 31 2017		October 31 2016		
	Uninsured		Uninsured		
	Residential mortgages (1)	Homeline products (2)	Residential mortgages (1)	Homeline products (2)	
Region (3)					
Atlantic provinces	74%	74%	73%	74%	
Quebec	72	73	71	74	
Ontario	70	67	70	69	
Alberta	73	72	73	72	
Saskatchewan and Manitoba	74	74	74	74	
B.C. and territories	69	65	68	65	
U.S.	73	n.m.	72	n.m.	
Other International	62	n.m.	63	n.m.	
Average of newly originated and acquired for the year (4), (5)	70%	68%	71%	69%	
Total Canadian Banking residential mortgages portfolio (6)	53%	49%	54%	51%	

(1) Residential mortgages exclude residential mortgages within the homeline products.

(2) Homeline products are comprised of both residential mortgages and home equity lines of credit.

(3) Region is based upon address of the property mortgaged. The Atlantic provinces are comprised of Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick, and B.C. and territories are comprised of British Columbia, Nunavut, Northwest Territories and Yukon.

(4) The average LTV ratio for newly originated and acquired uninsured residential mortgages and homeline products is calculated on a weighted basis by mortgage amounts at origination.

(5) For newly originated mortgages and homeline products, LTV is calculated based on the total facility amount for the residential mortgage and homeline product divided by the value of the related residential property.

(6) Weighted by mortgage balances and adjusted for property values based on the Teranet – National Bank National Composite House Price Index.

n.m. not meaningful

Credit quality performance

Provision for (recovery of) credit loss		Table 54	
(Millions of Canadian dollars, except percentage amounts)	2017	2016	
Personal & Commercial Banking	\$ 1,054	\$	1,122
Wealth Management	34		48
Capital Markets	62		327
Corporate Support and Other (1)	–		49
Total PCL	\$ 1,150	\$	1,546
Canada (2)			
Residential mortgages	\$ 33	\$	42
Personal	413		459
Credit cards	426		435
Small business	32		34
Retail	904		970
Wholesale	95		213
PCL on impaired loans	999		1,183
U.S. (2), (3)			
Retail	\$ 3	\$	1
Wholesale	117		227
PCL on impaired loans	120		228
Other International (2), (3)			
Retail	\$ 25	\$	41
Wholesale	6		44
PCL on impaired loans	31		85
PCL on loans not yet identified as impaired	–		50
Total PCL	\$ 1,150	\$	1,546
PCL ratio			
Total PCL ratio	0.21%		0.29%
PCL on impaired loans ratio	0.21%		0.28%
Personal & Commercial Banking	0.26%		0.29%
Canadian Banking	0.26%		0.29%
Caribbean Banking	0.44%		0.53%
Wealth Management	0.07%		0.10%
PCL ratio – loans	0.07%		0.08%
PCL ratio – acquired credit-impaired loans	0%		0.02%
Capital Markets	0.07%		0.37%

(1) PCL in Corporate Support and Other primarily comprised of PCL for loans not yet identified as impaired. For further information, refer to the How we measure and report our business segments section.

(2) Geographic information is based on residence of borrower.

(3) Includes acquired credit-impaired loans.

2017 vs. 2016

Total PCL decreased \$396 million, or 26% from the prior year. The PCL ratio of 21 bps improved 8 bps.

PCL in Personal & Commercial Banking decreased \$68 million or 6% mainly due to lower provisions in our Canadian personal lending portfolios. The PCL ratio of 26 bps improved 3 bps.

PCL in Wealth Management decreased \$14 million or 29%, mainly due to a recovery in International Wealth Management. This factor was partially offset by higher provisions in U.S. Wealth Management (including City National).

PCL in Capital Markets decreased \$265 million or 81%, primarily due to lower provisions, including higher recoveries, primarily in the oil & gas sector, partially offset by higher provisions in the real estate and related sector.

PCL in Corporate Support and Other decreased \$49 million, as the prior year included PCL for loans not yet identified as impaired.

Gross impaired loans (GIL)

Table 55

(Millions of Canadian dollars, except percentage amounts)	2017	2016
Personal & Commercial Banking	\$ 1,500	\$ 1,651
Wealth Management (1)	549	710
Capital Markets	527	1,524
Investor & Treasury Services	–	2
Corporate Support and Other	–	16
Total GIL	\$ 2,576	\$ 3,903
Canada (2)		
Retail	\$ 559	\$ 642
Wholesale	426	522
GIL	985	1,164
U.S. (1), (2)		
Retail	\$ 59	\$ 56
Wholesale	736	1,736
GIL	795	1,792
Other International (2)		
Retail	\$ 345	\$ 380
Wholesale	451	567
GIL	796	947
Total GIL	\$ 2,576	\$ 3,903
Impaired loans, beginning balance	\$ 3,903	\$ 2,285
Classified as impaired during the period (new impaired) (3)	2,269	3,673
Net repayments (3)	(1,192)	(946)
Amounts written off	(1,425)	(1,523)
Other (3), (4)	(979)	414
Impaired loans, balance at end of period	\$ 2,576	\$ 3,903
GIL ratio (5)		
Total GIL ratio	0.46%	0.73%
Personal & Commercial Banking	0.36%	0.43%
Canadian Banking	0.24%	0.27%
Caribbean Banking	6.33%	7.56%
Wealth Management	1.04%	1.44%
GIL ratio – loans	0.56%	0.59%
GIL ratio – acquired credit-impaired loans	0.48%	0.85%
Capital Markets	0.63%	1.73%

(1) Includes \$256 million (2016 – \$418 million) related to acquired credit-impaired loans. For further details refer to Notes 2 and 5 of our 2017 Annual Consolidated Financial Statements.

(2) Geographic information is based on residence of borrower.

(3) Certain GIL movements for Canadian Banking retail and wholesale portfolios are generally allocated to New impaired, as Return to performing status, Net repayments, Sold, and Exchange and other movements amounts are not reasonably determinable. Certain GIL movements for Caribbean Banking retail and wholesale portfolios are generally allocated to Net repayments and New impaired, as Return to performing status, Sold, and Exchange and other movements amounts are not reasonably determinable.

(4) Includes Return to performing status during the year, Recoveries of loans and advances previously written off, Sold, and Exchange and other movements.

(5) GIL as a % of related loans and acceptances.

2017 vs. 2016

Total GIL decreased \$1,327 million or 34% from the prior year, and the total GIL ratio of 46 bps improved 27 bps, largely reflecting lower impaired loans in our Capital Markets, Wealth Management and Personal & Commercial Banking portfolios. Total GIL also includes acquired credit-impaired loans (ACI) of \$256 million related to City National, which contributed 5 bps to the GIL ratio. For further details on ACI loans, refer to Notes 2 and 5 of our 2017 Annual Consolidated Financial Statements.

GIL in Personal & Commercial Banking decreased \$151 million or 9%, and the GIL ratio of 36 bps improved 7 bps, mainly due to lower impaired loans in our Caribbean portfolios, partially offset by higher impaired loans in our Canadian commercial lending portfolios.

GIL in Wealth Management decreased \$161 million or 23%, mainly reflecting repayments in U.S. Wealth Management (including City National).

GIL in Capital Markets decreased \$997 million or 65%, primarily due to lower impaired loans reflecting loans returning to performing status, and repayments in the oil & gas sector, partially offset by higher impaired loans in the real estate and related sector.

Allowance for credit losses (ACL)
Table 56

(Millions of Canadian dollars)	2017	2016
Allowance for impaired loans		
Personal & Commercial Banking	\$ 497	\$ 520
Wealth Management ⁽¹⁾	80	73
Capital Markets	160	216
Investor & Treasury Services	–	–
Corporate Support and Other	–	–
Total allowance for impaired loans	\$ 737	\$ 809
Canada ⁽²⁾		
Retail	\$ 141	\$ 160
Wholesale	124	119
Allowance for impaired loans	265	279
U.S. ^{(1), (2)}		
Retail	\$ 1	\$ 2
Wholesale	150	177
Allowance for impaired loans	151	179
Other International ⁽²⁾		
Retail	\$ 168	\$ 180
Wholesale	153	171
Allowance for impaired loans	321	351
Total allowance for impaired loans	\$ 737	\$ 809
Allowance for loans not yet identified as impaired	1,513	1,517
Total ACL	\$ 2,250	\$ 2,326

(1) Effective Q1 2016, includes ACL related to acquired credit-impaired loans from our acquisition of City National.

(2) Geographic information is based on residence of borrower.

2017 vs. 2016

Total ACL decreased \$76 million or 3% from a year ago, largely due to lower ACL in Capital Markets and Personal & Commercial Banking.

For further details, refer to Notes 2 and 5 of our 2017 Annual Consolidated Financial Statements.

Market risk

Market risk is defined to be the impact of market prices upon our financial condition. This includes potential gains or losses due to changes in market determined variables such as interest rates, credit spreads, equity prices, commodity prices, foreign exchange rates and implied volatilities.

The measures of financial condition impacted by market risk are as follows:

1. Positions whose revaluation gains and losses are reported in Revenue, which includes:
 - a) Changes in the fair value of instruments classified or designated as fair value through profit and loss (FVTPL), including impaired securities, and
 - b) Hedge ineffectiveness.
2. CET1 capital, which includes:
 - a) All of the above, plus
 - b) Changes in the fair value of AFS securities where revaluation gains and losses are reported as other comprehensive income,
 - c) Changes in the Canadian dollar value of investments in foreign subsidiaries, net of hedges, due to foreign exchange translation, and
 - d) Remeasurements of employee benefit plans; this includes pension fund assets underperforming in the market resulting in a deficit and volatility between the pension liabilities and the fund assets, and/or estimated actuarial parameters not being realized such that pension liabilities exceed pension fund assets.
3. CET1 ratio, which includes:
 - a) All of the above, plus
 - b) Changes in risk-weighted assets (RWA) resulting from changes in traded market risk factors, and
 - c) Changes in the Canadian dollar value of RWA due to foreign exchange translation.
4. The economic value of the Bank, which includes:
 - a) Points 1 and 2 above, plus
 - b) Changes in the value of other non-trading positions whose value is a function of market risk factors.

Market risk controls – FVTPL positions

As an element of the Enterprise Risk Appetite Framework, the Board of Directors approves our overall market risk constraints. GRM creates and manages the control structure for FVTPL positions which ensures that business is conducted consistent with Board requirements. The Market and Trading Credit Risk function within GRM is responsible for creating and managing the controls and governance procedures that ensure that risk taken is consistent with risk appetite constraints set by the Board. These controls include limits on probabilistic measures of potential loss such as Value-at-Risk and Stressed Value-at-Risk as defined below:

Value-at-Risk (VaR) is a statistical measure of potential loss for a financial portfolio computed at a given level of confidence and over a defined holding period. We measure VaR at the 99th percentile confidence level for price movements over a one-day holding period using historic simulation of the last two years of equally weighted historic market data. These calculations are updated daily with current risk positions, with the exception of certain less material positions that are not actively traded and are updated on at least a monthly basis.

Stressed Value-at-Risk (SVaR) is calculated in an identical manner as VaR with the exception that it is computed using a fixed historical one-year period of extreme volatility and its inverse rather than the most recent two-year history. The stress period used is the interval from September 2008 through August 2009. SVaR is calculated daily for all portfolios, with the exception of certain less material positions that are not actively traded and are updated on at least a monthly basis.

VaR and SVaR are statistical estimates based on historical market data and should be interpreted with knowledge of their limitations – which include the following:

- VaR and SVaR will not be predictive of future losses if the realized market movements differ significantly from the historical periods used to compute them.
- VaR and SVaR project potential losses over a one-day holding period and do not project potential losses for risk positions held over longer time periods.
- VaR and SVaR are measured using positions at close of business and do not include the impact of trading activity over the course of a day.

We validate our VaR and SVaR measures through a variety of means – including subjecting the models to vetting and validation by a group independent of the model developers and by back-testing the VaR against daily marked-to-market revenue to identify and examine events in which actual outcomes in trading revenue exceed the VaR projections.

Stress Tests – Our market risk stress testing program is used to identify and control risk due to large changes in market prices and rates. We conduct stress testing daily on positions that are marked-to-market. The stress tests simulate both historical and hypothetical events which are severe and long term in duration. Historical scenarios are taken from actual market events over the last 30 years and range in duration up to 90 days. Examples include the equity market crash of 1987 and the global financial crisis of 2008. Hypothetical scenarios are designed to be forward looking at potential future market stresses, and are designed to be severe but plausible. We are constantly evaluating and refining these scenarios as market conditions change. Stress results are calculated assuming an instantaneous revaluation of our positions with no management action.

These measures are computed on all positions that are FVTPL for financial reporting purposes, with the exception of those in a designated hedging relationship and those in our insurance businesses.

Market risk measures – FVTPL positions

VaR and SVaR

The following table presents our Market risk VaR and Market risk SVaR figures for 2017 and 2016.

Market risk VaR*		Table 57							
(Millions of Canadian dollars)	2017				2016				
	As at	For the year ended October 31			As at	For the year ended October 31			
	Oct. 31	Average	High	Low	Oct. 31	Average	High	Low	
Equity	\$ 10	\$ 12	\$ 26	\$ 6	\$ 13	\$ 16	\$ 32	\$ 7	
Foreign exchange	3	4	6	3	5	5	8	3	
Commodities	3	3	6	2	5	3	5	2	
Interest rate (1)	16	17	25	13	18	21	32	14	
Credit specific (2)	4	4	5	4	4	5	7	4	
Diversification (3)	(18)	(18)	n.m.	n.m.	(21)	(17)	n.m.	n.m.	
Market risk VaR	\$ 18	\$ 22	\$ 35	\$ 15	\$ 24	\$ 33	\$ 53	\$ 20	
Market risk Stressed VaR	\$ 43	\$ 53	\$ 95	\$ 34	\$ 46	\$ 82	\$ 150	\$ 41	

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

(1) General credit spread risk and funding spread risk associated with uncollateralized derivatives are included under interest rate VaR.

(2) Credit specific risk captures issuer-specific credit spread volatility.

(3) Market risk VaR is less than the sum of the individual risk factor VaR results due to portfolio diversification.

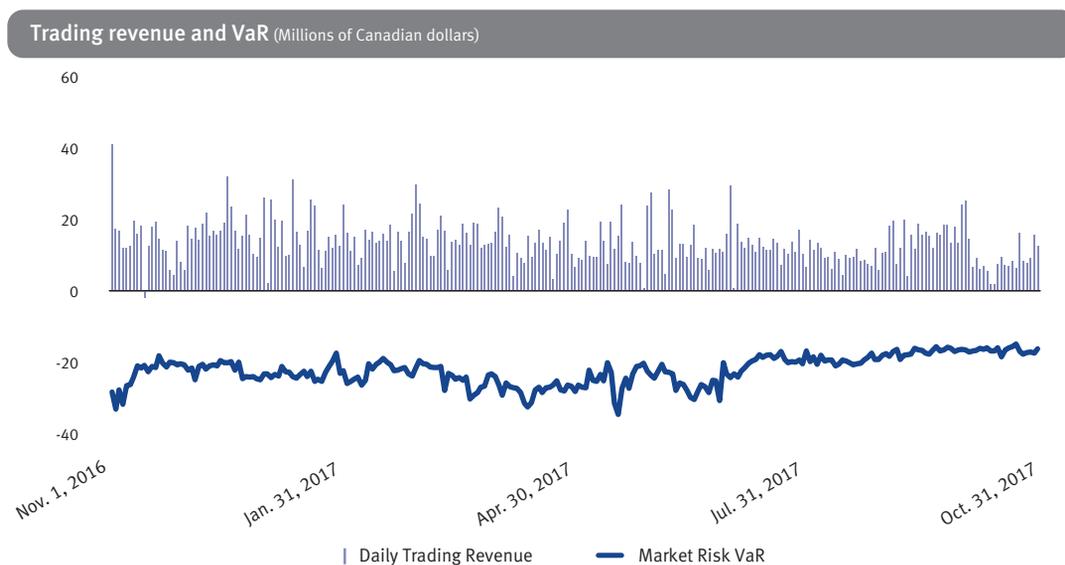
n.m. not meaningful

2017 vs. 2016

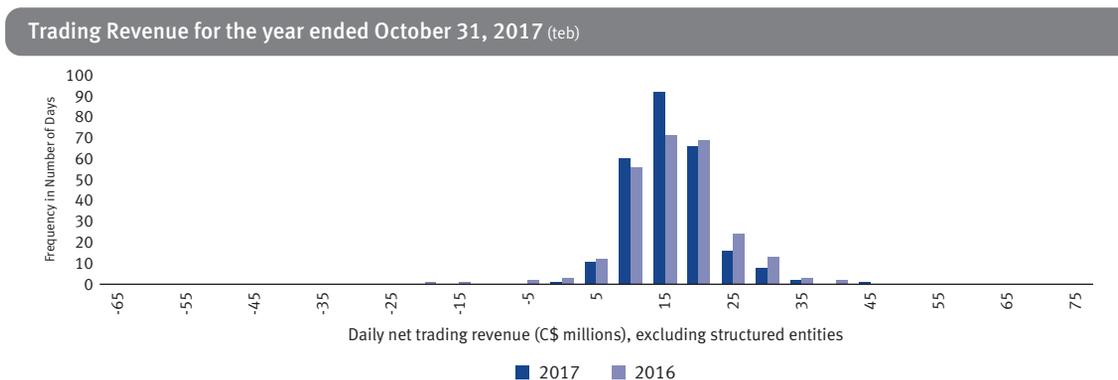
Average market risk VaR of \$22 million decreased \$11 million from the prior year. Reduced average equity exposures were observed in 2017 due to lower than expected client-driven activity in rising equity markets, with volatility reaching historical lows. Furthermore, exposures in fixed income and securitized product portfolios have been maintained at lower levels on average. This follows portfolio reductions in 2016 as reflected in the interest rate and credit specific risk metrics. The impact of foreign exchange translation also contributed to the decrease.

Average SVaR of \$53 million decreased \$29 million from the prior year, largely driven by reduced equity exposures and the impact of foreign exchange translation as noted above, and the winding down of certain legacy trading portfolios in 2016.

The following chart displays a bar graph of our daily trading profit and loss and a line graph of our daily market risk VaR. We incurred 1 day of losses totalling \$2 million in 2017 compared to 7 days of losses totalling \$63 million in 2016, with none of the losses exceeding VaR.



The following chart displays the distribution of daily trading profit and loss in 2017. The only daily reported loss during the year was \$2 million on November 14, 2016. The largest reported profit was \$41 million with an average daily profit of \$14 million.



Market risk measures for other FVTPL positions – Assets and liabilities of RBC Insurance

We offer a range of insurance products to clients and hold investments to meet the future obligations to policyholders. The investments which support actuarial liabilities are predominantly fixed income assets designated as FVTPL. Consequently, changes in the fair values of these assets are recorded in investment income in the consolidated statements of income and are largely offset by changes in the fair value of the actuarial liabilities, the impact of which is reflected in insurance policyholder benefits and claims. As at October 31, 2017, we had liabilities with respect to insurance obligations of \$9.7 billion, up from \$9.2 billion in the prior year, and trading securities of \$7.7 billion in support of the liabilities, up from \$7.2 billion last year.

Market risk controls – Structural Interest Rate Risk (SIRR) positions⁽¹⁾

The interest rate risk arising from traditional banking products, such as deposits and loans, is referred to as SIRR and is subject to limits and controls. SIRR measures also include related hedges as well as the interest rate risk from securities held for liquidity management. Factors contributing to SIRR include the mismatch between asset and liability repricing dates, relative changes in asset and liability rates, and other product features that could affect the expected timing of cash flows, such as options to pre-pay loans or redeem term deposits prior to contractual maturity.

The Board of Directors approves the risk appetite for SIRR, and the Asset-Liability Committee (ALCO), along with GRM, provides ongoing governance of SIRR measurement and management through risk policies, limits, operating standards and other controls. SIRR reports are reviewed regularly by GRM, ALCO, the Group Risk Committee, the Risk Committee of the Board and the Board of Directors.

Details on the non-trading risks included in SIRR are outlined in Table 59.

⁽¹⁾ SIRR positions include impact of derivatives in hedge accounting relationships and AFS securities used for interest rate risk management.

SIRR measurement

To monitor and control SIRR, we assess two primary metrics, 12-month Net Interest Income (NII) risk and Economic Value of Equity (EVE) risk, under a range of market shocks and scenarios. Market scenarios include currency-specific parallel and non-parallel yield curve changes and interest rate volatility shocks.

In measuring NII risk, detailed structural balance sheets and income statements are dynamically simulated to determine the impact of market stress scenarios on projected NII. Assets, liabilities and off-balance sheet positions are simulated using monthly time steps over a one-year horizon. The simulations incorporate product maturities, renewals and growth along with prepayment and redemption behaviour. Product pricing and volumes are forecast based on past experience and expectations for a given market stress scenario. EVE risk captures the market value sensitivity of structural positions to changes in longer-term rates. In measuring EVE risk, deterministic (single-scenario) and stochastic (multiple-scenario) valuation techniques are applied to detailed spot position data. NII and EVE risks are measured for a range of market risk stress scenarios which include extreme but plausible changes in market rates and volatilities. These SIRR measures do not include the benefit of management actions.

Management of NII and EVE risk is complementary and supports our efforts to generate a sustainable high-quality NII stream. NII and EVE risks for specific units are measured daily, weekly or monthly depending on its materiality, complexity and hedge strategy.

A number of assumptions affecting cash flows, product re-pricing and the administration of rates underlie the models used to measure NII and EVE risk. The key assumptions pertain to the expected funding profile for mortgage rate commitments, fixed rate loan prepayment behaviour, term deposit redemption behaviour, and the treatment of non-maturity deposits. All assumptions are derived empirically based on historical client behaviour and product pricing with consideration of future behavioural changes. All models and assumptions used to measure SIRR are subject to independent oversight by GRM.

Market risk measures – Structural Interest Rate Sensitivities

The following table shows the potential before-tax impact of an immediate and sustained 100 bps and 200 bps increase or decrease in interest rates on projected 12-month NII and EVE for our structural balance sheet, assuming no subsequent hedging. Rate floors are applied within the declining rates scenarios, with floor levels set based on rate changes experienced globally. Interest rate risk measures are based upon interest rate exposures at a specific time and continuously change as a result of business activities and management actions.

Market risk – SIRR measures*

Table 58

(Millions of Canadian dollars)	2017						2016	
	EVE risk			NII risk (1)			EVE risk	NII risk (1)
	Canadian dollar impact	U.S. dollar impact (2)	Total	Canadian dollar impact	U.S. dollar impact (2)	Total		
Before-tax impact of:								
100bps increase in rates	\$ (1,105)	\$ (110)	\$ (1,215)	\$ 269	\$ 182	\$ 451	\$ (1,377)	\$ 420
100bps decrease in rates	962	(324)	638	(385)	(219)	(604)	644	(465)
Before-tax impact of:								
200bps increase in rates	(2,199)	(308)	(2,507)	472	353	825	(2,883)	711
200bps decrease in rates	1,943	(940)	1,003	(647)	(360)	(1,007)	664	(467)

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

(1) Represents the 12-month NII exposure to an instantaneous and sustained shift in interest rates.

(2) Represents the impact on the SIRR portfolios held in our City National and U.S. banking operations.

As at October 31, 2017, an immediate and sustained -100 bps shock would have had a negative impact to our NII of \$604 million, up from \$465 million last year. An immediate and sustained +100 bps shock at the end of October 31, 2017 would have had a negative impact to the Bank's EVE of \$1,215 million, down from \$1,377 million reported last year. The year-over-year NII sensitivity to rate increases was positioned marginally higher. Under the declining rate scenarios, NII risk has increased primarily as a result of higher rates, which allows rates to decline further under the down shock scenario. During 2017, NII and EVE risks remained well within approved limits.

Market risk measures for other material non-trading portfolios

AFS securities

We held \$75.9 billion of securities classified as AFS as at October 31, 2017, compared to \$69.9 billion as at October 31, 2016. We hold debt securities designated as AFS primarily as investments, as well as to manage liquidity risk and hedge interest rate risk in our non-trading banking balance sheet. Certain legacy debt portfolios are also classified as AFS. Changes in the value of these securities are reported in other comprehensive income. As at October 31, 2017, our portfolio of AFS securities exposes us to interest rate risk of a pre-tax change in value of \$9.8 million as measured by the change in the value of the securities for a one basis point parallel increase in yields. The portfolio also exposes us to credit spread risk of a pre-tax change in value of \$25.0 million, as measured by the change in value for a one basis point widening of credit spreads. The value of the AFS securities included in our SIRR measure as at October 31, 2017 was \$36.4 billion. Our AFS securities also include equity exposures of \$1.2 billion as at October 31, 2017, down from \$1.6 billion in the prior year.

Derivatives related to non-trading activity

Derivatives are also used to hedge market risk exposures unrelated to our trading activity. In aggregate, derivative assets not related to trading activity of \$3.2 billion as at October 31, 2017 were down from \$5.1 billion last year, and derivative liabilities of \$3.2 billion as at October 31, 2017 were down from \$4.1 billion last year.

Non-trading derivatives in hedge accounting relationships

The derivative assets and liabilities described above include derivative assets in a designated hedge accounting relationship of \$1.3 billion as at October 31, 2017, down from \$2.4 billion as at October 31, 2016, and derivative liabilities of \$1.5 billion as at October 31, 2017, down from \$1.8 billion last year. These derivative assets and liabilities are included in our SIRR measure and other internal non-trading market risk measures. We use interest rate swaps to manage our AFS securities and structural interest rate risk. To the extent these swaps are considered effective, changes in their fair value are recognized in other comprehensive income. The interest rate risk for the swaps designated as cash flow hedges, measured as the change in the fair value of the derivatives for a one basis point parallel increase in yields, was \$7.7 million as of October 31, 2017 compared to \$5.2 million as of October 31, 2016.

Interest rate swaps are also used to hedge changes in the fair value of certain fixed-rate instruments. Changes in fair value of the hedged instruments that are related to interest rate movements and the corresponding interest rate swaps are reflected in the consolidated statement of income.

We also use foreign exchange derivatives to manage our exposure to equity investments in subsidiaries that are denominated in foreign currencies, particularly the U.S. dollar, British pound, and Euro. Changes in the fair value of these hedges and the cumulative translation adjustment related to our structural foreign exchange risk are reported in other comprehensive income.

Other non-trading derivatives

Derivatives, including interest rate swaps and foreign exchange derivatives, that are not in designated hedge accounting relationships are used to manage other non-trading exposures. Changes in the fair value of these derivatives are reflected in the consolidated statement of income. Derivative assets of \$1.9 billion as at October 31, 2017 were down from \$2.7 billion as at October 31, 2016, and derivative liabilities of \$1.7 billion as at October 31, 2017 were down from \$2.3 billion last year.

Non-trading foreign exchange rate risk

Foreign exchange rate risk is the potential adverse impact on earnings and economic value due to changes in foreign currency rates. Our revenue, expenses and income denominated in currencies other than the Canadian dollar are subject to fluctuations as a result of changes in the value of the average Canadian dollar relative to the average value of those currencies. Our most significant exposure is to the U.S. dollar, due to our operations in the U.S. and other activities conducted in U.S. dollars. Other significant exposures are to the British pound and the Euro, due to our activities conducted internationally in these currencies. A strengthening or weakening of the Canadian dollar compared to the U.S. dollar, British pound and the Euro could reduce or increase, as applicable, the translated value of our foreign currency denominated revenue, expenses and earnings and could have a significant effect on the results of our operations. We are also exposed to foreign exchange rate risk arising from our investments in foreign operations. For unhedged equity investments, when the Canadian dollar appreciates against other currencies, the unrealized translation losses on net foreign investments decreases our shareholders' equity through the other components of equity and decreases the translated value of the Risk-weighted Assets (RWA) of the foreign currency-denominated asset. The reverse is true when the Canadian dollar depreciates against other currencies. Consequently, we consider these impacts in selecting an appropriate level of our investments in foreign operations to be hedged.

Our overall trading and non-trading market risk objectives, policies and methodologies have not changed significantly from 2016.

Linkage of market risk to selected balance sheet items

The following table provides the linkages between selected balance sheet items with positions included in our trading market risk and non-trading market risk disclosures, which illustrates how we manage market risk for our assets and liabilities through different risk measures:

Linkage of market risk to selected balance sheet items		Table 59			
		As at October 31, 2017			
		Market risk measure			
(Millions of Canadian dollars)		Balance sheet amount	Traded risk (1)	Non-traded risk (2)	Non-traded risk primary risk sensitivity
Assets subject to market risk					
Cash and due from banks (3)	\$ 28,407	\$ –	\$ 28,407		Interest rate
Interest-bearing deposits with banks (4)	32,662	20,792	11,870		Interest rate
Securities					
Trading (5)	127,657	119,815	7,842		Interest rate, credit spread
Available-for-sale (6)	90,722	–	90,722		Interest rate, credit spread, equity
Assets purchased under reverse repurchase agreements and securities borrowed (7)	220,977	141,532	79,445		Interest rate
Loans					
Retail (8)	385,170	7,638	377,532		Interest rate
Wholesale (9)	159,606	4,217	155,389		Interest rate
Allowance for loan losses	(2,159)	–	(2,159)		Interest rate
Segregated fund net assets (10)	1,216	–	1,216		Interest rate
Derivatives	95,023	91,791	3,232		Interest rate, foreign exchange
Other assets (11)	68,545	2,006	66,539		Interest rate
Assets not subject to market risk (12)	5,027				
Total assets	\$ 1,212,853	\$ 387,791	\$ 820,035		
Liabilities subject to market risk					
Deposits (13)	\$ 789,635	\$ 78,194	\$ 711,441		Interest rate
Segregated fund liabilities (14)	1,216	–	1,216		Interest rate
Other					
Obligations related to securities sold short	30,008	30,008	–		
Obligations related to assets sold under repurchase agreements and securities loaned (15)	143,084	136,371	6,713		Interest rate
Derivatives	92,127	88,919	3,208		Interest rate, foreign exchange
Other liabilities (16)	65,565	4,275	61,290		Interest rate
Subordinated debentures	9,265	–	9,265		Interest rate
Liabilities not subject to market risk (17)	7,525				
Total liabilities	\$ 1,138,425	\$ 337,767	\$ 793,133		
Total equity	\$ 74,428				
Total liabilities and equity	\$ 1,212,853				

(1) Traded risk includes positions that are classified or designated as FVTPL and positions whose revaluation gains and losses are reported in revenue. Market risk measures of VaR and SVaR and stress testing are used as risk controls for traded risk.

(2) Non-traded risk includes positions used in the management of the SIRR and other non-trading portfolios. Other material non-trading portfolios include positions from RBC Insurance and AFS securities not included in SIRR.

The following footnotes provide additional information on the Non-traded risk amounts:

(3) Cash and due from banks includes \$15,895 million included in SIRR. An additional \$12,512 million is included in other risk controls.

(4) Interest-bearing deposits with banks of \$11,870 million are included in SIRR.

(5) Trading securities include \$7,706 million in securities for asset/liability management of RBC Insurance. An additional \$136 million is included in other risk controls.

(6) Includes AFS securities of \$75,877 million and held-to-maturity securities of \$14,845 million. \$51,269 million of the total securities are included in SIRR. An additional \$1,946 million are held by RBC Insurance. The remaining \$37,507 million are captured in other internal non-trading market risk reporting.

(7) Assets purchased under reverse repurchase agreements include \$32,541 million reflected in SIRR. An additional \$46,904 million is included in other risk controls.

(8) Retail loans include \$366,928 million reflected in SIRR and \$241 million is used for asset/liability management of RBC Insurance. An additional \$10,363 million is included in other risk controls.

(9) Wholesale loans include \$153,829 million reflected in SIRR. An additional \$1,560 million is used for asset/liability management of RBC Insurance.

(10) Investments for the account of segregated fund holders are included in RBC Insurance risk measures.

(11) Other assets include \$37,999 million reflected in SIRR and \$2,428 million is used for asset/liability management of RBC Insurance. An additional \$26,112 million is included in other risk controls.

(12) Assets not subject to market risk include \$5,027 million of physical and other assets.

(13) Deposits include \$650,841 million reflected in SIRR. The remaining \$60,600 million are captured in other internal non-trading market risk reporting.

(14) Insurance and investment contracts for the account of segregated fund holders are included in RBC Insurance risk measures.

(15) Obligations related to assets sold under repurchase agreements and securities loaned include \$6,713 million included in other risk controls.

(16) Other liabilities include \$36,019 million reflected in SIRR and \$10,318 million of RBC Insurance liabilities. An additional \$14,953 million is included in other risk controls.

(17) Liabilities not subject to market risk include \$7,525 million of payroll related and other liabilities.

As at October 31, 2016 (1)

(Millions of Canadian dollars)	Balance sheet amount	Market risk measure		Non-traded risk primary risk sensitivity
		Traded risk (2)	Non-traded risk (3)	
Assets subject to market risk				
Cash and due from banks (4)	\$ 14,929	\$ –	\$ 14,929	Interest rate
Interest-bearing deposits with banks (5)	27,851	16,058	11,793	Interest rate
Securities				
Trading (6)	151,292	144,001	7,291	Interest rate, credit spread
Available-for-sale (7)	84,801	–	84,801	Interest rate, credit spread, equity
Assets purchased under reverse repurchase agreements and securities borrowed (8)	186,302	121,692	64,610	Interest rate
Loans				
Retail (9)	369,470	9,081	360,389	Interest rate
Wholesale (10)	154,369	2,341	152,028	Interest rate
Allowance for loan losses	(2,235)	–	(2,235)	Interest rate
Segregated fund net assets (11)	981	–	981	Interest rate
Derivatives	118,944	113,862	5,082	Interest rate, foreign exchange
Other assets (12)	68,363	1,440	66,923	Interest rate
Assets not subject to market risk (13)	5,191			
Total assets	\$ 1,180,258	\$ 408,475	\$ 766,592	
Liabilities subject to market risk				
Deposits (14)	\$ 757,589	\$ 81,986	\$ 675,603	Interest rate
Segregated fund liabilities (15)	981	–	981	Interest rate
Other				
Obligations related to securities sold short	50,369	50,369	–	
Obligations related to assets sold under repurchase agreements and securities loaned (16)	103,441	88,863	14,578	Interest rate
Derivatives	116,550	112,500	4,050	Interest rate, foreign exchange
Other liabilities (17)	62,625	5,439	57,186	Interest rate
Subordinated debentures	9,762	–	9,762	Interest rate
Liabilities not subject to market risk (18)	7,329			
Total liabilities	\$ 1,108,646	\$ 339,157	\$ 762,160	
Total equity	\$ 71,612			
Total liabilities and equity	\$ 1,180,258			

(1) Amounts have been revised from those previously presented.

(2) Traded risk includes positions that are classified or designated as FVTPL and positions whose revaluation gains and losses are reported in revenue. Market risk measures of VaR and SVaR and stress testing are used as risk controls for traded risk.

(3) Non-traded risk includes positions used in the management of the SIRR and other non-trading portfolios. Other material non-trading portfolios include positions from RBC Insurance and AFS securities not included in SIRR.

The following footnotes provide additional information on the Non-traded risk amounts:

(4) Cash and due from banks includes \$12,644 million included in SIRR. An additional \$2,285 million is included in other risk controls.

(5) Interest-bearing deposits with banks of \$11,793 million are included in SIRR.

(6) Trading securities include \$7,171 million in securities for asset/liability management of RBC Insurance. An additional \$120 million is included in other risk controls.

(7) Includes AFS securities of \$69,922 million and held-to-maturity securities of \$14,879 million. \$51,239 million of the total securities are included in SIRR. An additional \$1,901 million are held by RBC Insurance. The remaining \$31,661 million are captured in other internal non-trading market risk reporting.

(8) Assets purchased under reverse repurchase agreements include \$24,838 million reflected in SIRR. An additional \$39,772 million is included in other risk controls.

(9) Retail loans include \$350,019 million reflected in SIRR and \$251 million is used for asset/liability management of RBC Insurance. An additional \$10,119 million is included in other risk controls.

(10) Wholesale loans include \$150,619 million reflected in SIRR. An additional \$1,409 million is used for asset/liability management of RBC Insurance.

(11) Investments for the account of segregated fund holders are included in RBC Insurance risk measures.

(12) Other assets include \$39,272 million reflected in SIRR and \$2,463 million is used for asset/liability management of RBC Insurance. An additional \$25,188 million is included in other risk controls.

(13) Assets not subject to market risk include \$5,191 million of physical and other assets.

(14) Deposits include \$644,812 million reflected in SIRR. The remaining \$30,791 million are captured in other internal non-trading market risk reporting.

(15) Insurance and investment contracts for the account of segregated fund holders are included in RBC Insurance risk measures.

(16) Obligations related to assets sold under repurchase agreements and securities loaned include \$14,578 million included in other risk controls.

(17) Other liabilities include \$35,526 million reflected in SIRR and \$9,900 million of RBC Insurance liabilities. An additional \$11,760 million is included in other risk controls.

(18) Liabilities not subject to market risk include \$7,329 million of payroll related and other liabilities.

Liquidity and funding risk

Liquidity and funding risk (liquidity risk) is the risk that we may be unable to generate sufficient cash or its equivalents in a timely and cost-effective manner to meet our commitments as they come due. Liquidity risk arises from mismatches in the timing and value of on-balance sheet and off-balance sheet cash flows.

Our liquidity profile is structured to ensure that we have sufficient liquidity to satisfy current and prospective commitments in both normal and stressed business and liquidity environments. To achieve these goals, we operate under a comprehensive Liquidity Risk Management Framework (LRMF) and Pledging Policy. We also employ several liquidity risk mitigation strategies that include:

- An appropriate balance between the level of exposure allowed under our risk appetite and the cost of risk mitigation;
- Broad funding access, including preserving and promoting a reliable base of core client deposits and ongoing access to diversified sources of wholesale funding;
- A comprehensive liquidity stress testing program, contingency, recovery and resolution planning and status monitoring to ensure sufficiency of unencumbered marketable securities and demonstrated capacities to monetize specific asset classes;
- Governance of pledging activity through limits and liquid asset buffers for potential pledging activity;
- Timely and granular risk measurement information;
- Transparent liquidity transfer pricing and cost allocation; and
- A rigorous first and second line of defense governance model.

Risk control

Our liquidity risk objectives, policies and methodologies are reviewed regularly, and updated to reflect changing market conditions and business mix, to align with local regulatory developments and to position ourselves for the phase-in of Basel III regulatory liquidity standards. We continue to maintain liquidity and funding that is appropriate for the execution of our strategy. Liquidity risk remains well within our risk appetite.

The Board of Directors annually approves the delegation of liquidity risk authorities to senior management. The Risk Committee of the Board annually approves the LRMF and the Pledging Policy and is responsible for their oversight. The Board of Directors, the Risk Committee of the Board, the GRC and the ALCO regularly review reporting on our enterprise-wide liquidity position and status. The GRC, the Policy Review Committee (PRC) and/or the ALCO also review liquidity documents prepared for the Board of Directors or its committees.

- The PRC annually approves the Liquidity Risk Policy (LRP), which establishes minimum risk control elements in accordance with the Board-approved risk appetite and the LRMF.
- The ALCO annually approves the Liquidity Contingency Plan (LCP) and provides strategic direction and oversight to Corporate Treasury, other functions, and business segments on the management of liquidity.

These policies are supported by operational, desk and product-level policies that implement risk control elements, such as parameters, methodologies, management limits and authorities that govern the measurement and management of liquidity. Stress testing is also employed to assess the robustness of the control framework and inform liquidity contingency plans.

Risk measurement

Liquidity risk is measured by applying scenario-based assumptions against our assets and liabilities and off-balance sheet commitments to derive expected cash flow profiles over varying time horizons. For instance, government bonds can be quickly and reliably monetized without significant loss of value to generate cash inflow prior to their contractual maturity, and similarly, relationship demand deposits can be deemed as having little risk of short-term cash outflow, although depositors have the contractual right to redeem on demand. Risk methodologies and underlying assumptions are periodically reviewed and validated to ensure alignment with our operating environment, expected economic and market conditions, rating agency preferences, regulatory requirements and accepted practices.

To manage liquidity risk within our liquidity risk appetite, we set limits on various metrics reflecting a range of time horizons and severity of stress conditions and develop contingency, recovery and resolution plans. Our liquidity risk measurement and control activities are divided into three categories as follows:

Structural (longer-term) liquidity risk

To guide our secured and unsecured wholesale term funding activities, we employ an internal metric to focus on the structural alignment between long-term illiquid assets and longer-term funding sourced from wholesale investors and core relationship deposits.

Tactical (shorter-term) liquidity risk

To address more immediate cash flow risks we may experience in times of stress, we use short-term net cash flow limits, in conjunction with stress testing, to contain risk within the risk appetite at branch, subsidiary and currency levels. Net cash flow positions are derived from the application of internally generated risk assumptions and parameters to known and anticipated cash flows for all material unencumbered assets, liabilities and off-balance sheet activities. Encumbered assets are not considered a source of available liquidity. We also control tactical liquidity by adhering to enterprise-wide and unit-specific prescribed regulatory standards, such as LCR.

Contingency liquidity risk

Contingency liquidity risk planning assesses the impact of and our intended responses to sudden stressful events. Our LCP, maintained and administered by Corporate Treasury, guides our actions and responses to liquidity crises. This plan establishes a Liquidity Crisis Team, led by Corporate Treasury, and consisting of senior representatives with relevant subject matter expertise from key business segments, Group Risk Management, Finance, and Operations. This team contributes to the development of stress tests and funding plans and meets regularly to assess our liquidity status, conduct stress tests and review liquidity contingency preparedness.

Our stress tests, which include elements of scenario and sensitivity analyses, measure our prospective exposure to global, country-specific and RBC-specific events over a period of several weeks. Different levels of severity are considered for each type of crisis with some scenarios reflecting multiple notch downgrades to our credit ratings.

The contingency liquidity risk planning process identifies contingent funding needs (e.g., draws on committed credit and liquidity lines, demands for more collateral and deposit run-off) and sources (e.g., contingent liquid asset sales and incremental wholesale funding capacity) under various stress scenarios, and as a result, informs requirements for our earmarked contingent unencumbered liquid asset pools.

Our contingent liquid asset pools consist of diversified, highly rated and liquid marketable securities, overnight government reverse repos, and deposits with central banks. These portfolios are subject to minimum asset quality levels and, as appropriate, other strict eligibility guidelines (e.g., maturity, diversification and eligibility for central bank advances) to maximize ready access to cash in emergencies. These securities, when added to other unencumbered liquid assets that we hold as a result of capital markets or other activities, combine to populate our liquidity reserve and asset encumbrance disclosures provided below.

Liquidity reserve and asset encumbrance

The following tables provide summaries of our liquidity reserve and asset encumbrance. In both tables, unencumbered assets represent, for the most part, a ready source of funding that can be accessed quickly. For the purpose of constructing the following tables, encumbered assets include: (i) bank-owned liquid assets that are either pledged as collateral (e.g., repo financing and derivative pledging) or not freely available due to regulatory or internal policy requirements (e.g., earmarked to satisfy mandatory reserve or local capital adequacy requirements and to maintain continuous access to payment and settlement systems); (ii) securities received as collateral from securities financing and derivative transactions which have either been re-hypothecated where permissible (e.g., to obtain financing through repos or to cover securities sold short) or have no liquidity value since re-hypothecation is prohibited; and (iii) illiquid assets that have been securitized and sold into the market or that have been pledged as collateral in support of structured term funding vehicles. As per our liquidity management framework and practice, we do not include encumbered assets as a source of available liquidity in measuring liquidity risk. Unencumbered assets are the difference between total and encumbered assets from both on- and off-balance sheet sources.

Liquidity reserve

In the liquidity reserve table, available liquid assets consist of on-balance sheet cash and securities holdings, as well as securities received as collateral from securities financing (reverse repos and off-balance sheet collateral swaps) and derivative transactions, and constitute the preferred source for quickly accessing liquidity. The other component of our liquidity reserve consists primarily of uncommitted and undrawn central bank credit facilities that could be accessed under exceptional circumstances, provided certain pre-conditions could be met and where advances could be supported by eligible assets (e.g., certain unencumbered loans) not included in the liquid assets category.

The liquidity reserve is mainly affected by routine flows of client banking activity where liquid asset portfolios adjust to the change in cash balances, and additionally from capital markets activities where business strategies and client flows may also affect the addition or subtraction of liquid assets in the overall calculation of the liquidity reserve. Corporate Treasury also affects liquidity reserves through the management of funding issuances where reserves absorb timing mismatches between debt issuances and deployment into business activities.

Liquidity reserve

Table 60

	As at October 31, 2017				
	Bank-owned liquid assets (1)	Securities received as collateral from securities financing and derivative transactions	Total liquid assets	Encumbered liquid assets	Unencumbered liquid assets
(Millions of Canadian dollars)					
Cash and holding at central banks	\$ 46,581	\$ –	\$ 46,581	\$ 2,045	\$ 44,536
Deposits in other banks available overnight	4,004	–	4,004	203	3,801
Securities issued or guaranteed by sovereigns, central banks or multilateral development banks (2)	303,003	27,534	330,537	187,465	143,072
Other securities	142,272	44,487	186,759	77,696	109,063
Liquidity assets eligible at central banks (not included above) (3)	436	–	436	–	436
Undrawn credit lines granted by central banks (4)	12,007	–	12,007	–	12,007
Other assets eligible as collateral for discount (5)	94,207	–	94,207	–	94,207
Other liquid assets (6)	19,520	–	19,520	19,520	–
Total liquid assets	\$ 622,030	\$ 72,021	\$ 694,051	\$ 286,929	\$ 407,122

	As at October 31, 2016				
	Bank-owned liquid assets (1)	Securities received as collateral from securities financing and derivative transactions	Total liquid assets	Encumbered liquid assets	Unencumbered liquid assets
(Millions of Canadian dollars)					
Cash and holding at central banks	\$ 31,771	\$ –	\$ 31,771	\$ 1,781	\$ 29,990
Deposits in other banks available overnight	1,679	–	1,679	262	1,417
Securities issued or guaranteed by sovereigns, central banks or multilateral development banks (2), (3)	281,313	28,564	309,877	154,105	155,772
Other securities	146,269	34,386	180,655	72,765	107,890
Liquidity assets eligible at central banks (not included above) (4)	600	–	600	–	600
Undrawn credit lines granted by central banks (5)	13,558	–	13,558	–	13,558
Other assets eligible as collateral for discount (6)	141,888	–	141,888	–	141,888
Other liquid assets (7)	23,307	–	23,307	23,307	–
Total liquid assets	640,385	\$ 62,950	\$ 703,335	\$ 252,220	\$ 451,115

	As at	
	October 31 2017	October 31 2016
(Millions of Canadian dollars)		
Royal Bank of Canada	\$ 204,999	\$ 264,522
Foreign branches	63,283	53,006
Subsidiaries	138,840	133,587
Total unencumbered liquid assets	\$ 407,122	\$ 451,115

(1) The Bank-owned liquid assets amount includes securities owned outright by the Bank as well as collateral received through reverse repurchase transactions.

(2) Includes liquid securities issued by provincial governments and U.S. government-sponsored entities working under U.S. Federal government's conservatorship (e.g., Federal National Mortgage Association and Federal Home Loan Mortgage Corporation).

(3) Amounts have been revised from those previously presented.

(4) Includes Auction Rate Securities.

(5) Includes loans that qualify as eligible collateral for the discount window facility available to us at the Federal Reserve Bank of New York (Federal Reserve Bank). Amounts are face value and would be subject to collateral margin requirements applied by the Federal Reserve Bank to determine collateral value/borrowing capacity. Access to the discount window borrowing program is conditional on meeting requirements set by the Federal Reserve Bank and borrowings are typically expected to be infrequent and due to uncommon occurrences requiring temporary accommodation.

(6) Represents our unencumbered Canadian dollar non-mortgage loan book (at face value) that could, subject to satisfying conditions precedent to borrowing and application of prescribed collateral margin requirements, be pledged to the Bank of Canada for advances under its Emergency Lending Assistance (ELA) program. ELA and other central bank facilities are not considered sources of available liquidity in our normal liquidity risk profile but could in extraordinary circumstances, where normal market liquidity is seriously impaired, allow us and other banks to monetize assets eligible as central bank collateral to meet requirements and mitigate further market liquidity disruption.

(7) Represents pledges related to OTC and exchange-traded derivative transactions.

2017 vs. 2016

Total liquid assets decreased \$23.6 billion or 3%, primarily due to a reduction in non-mortgage loans that qualify to be pledged under the ELA program due to the change of the eligibility criteria by the BoC. This decline was partially offset by higher balances of cash and holdings at central banks.

Asset encumbrance

The table below provides a summary of cash, securities and other assets, distinguishing between those that are encumbered assets and those available for sale or use as collateral in secured funding transactions. Other assets, such as mortgages and credit card receivables can also be monetized, although over a longer timeframe than that required for marketable securities. As at October 31, 2017, our Unencumbered assets available as collateral comprised 33% of our total assets (October 31, 2016 – 38%).

Asset encumbrance

Table 61

(Millions of Canadian dollars)	As at									
	October 31 2017					October 31 2016				
	Encumbered		Unencumbered			Encumbered		Unencumbered		
	Pledged as collateral	Other (1)	Available as collateral (2)	Other (3)	Total	Pledged as collateral	Other (1)	Available as collateral (2)	Other (3)	Total
Cash and due from banks	\$ 6	\$ 2,039	\$ 26,362	\$ –	\$ 28,407	\$ –	\$ 1,781	\$ 13,148	\$ –	\$ 14,929
Interest-bearing deposits with banks	–	204	32,458	–	32,662	–	262	27,589	–	27,851
Securities										
Trading	51,344	–	74,922	1,391	127,657	66,734	–	83,219	1,339	151,292
Available-for-sale	3,184	–	86,442	1,096	90,722	2,858	–	78,966	2,977	84,801
Assets purchased under reverse repurchase agreements and securities borrowed (4), (5)	222,128	23,131	74,950	–	320,209	166,449	20,450	82,749	–	269,648
Loans										
Retail										
Mortgage securities	35,861	–	32,589	–	68,450	34,624	–	35,591	–	70,215
Mortgage loans	38,504	–	14,737	148,657	201,898	40,293	–	12,796	131,694	184,783
Non-mortgage loans	8,776	–	65,449	40,597	114,822	10,422	–	100,612	3,438	114,472
Wholesale	3,713	–	27,637	128,256	159,606	3,477	–	41,445	109,447	154,369
Allowance for loan losses	–	–	–	(2,159)	(2,159)	–	–	–	(2,235)	(2,235)
Segregated fund net assets	–	–	–	1,216	1,216	–	–	–	981	981
Other – Derivatives	–	–	–	95,023	95,023	–	–	–	118,944	118,944
– Others (6)	19,520	–	–	54,052	73,572	23,307	–	–	50,247	73,554
Total assets	\$ 383,036	\$ 25,374	\$ 435,546	\$ 468,129	\$ 1,312,085	\$ 348,164	\$ 22,493	\$ 476,115	\$ 416,832	\$ 1,263,604

- (1) Includes assets restricted from use to generate secured funding due to legal or other constraints.
- (2) Includes loans that could be used to collateralize central bank advances. Our unencumbered Canadian dollar non-mortgage loan book (at face value) could, subject to satisfying conditions for borrowing and application of prescribed collateral margin requirements, be pledged to the Bank of Canada for advances under its ELA program. We also lodge loans that qualify as eligible collateral for the discount window facility available to us at the Federal Reserve Bank of New York. ELA and other central bank facilities are not considered sources of available liquidity in our normal liquidity risk profile. However, banks could monetize assets meeting central bank collateral criteria during periods of extraordinary and severe disruption to market-wide liquidity.
- (3) Other unencumbered assets are not subject to any restrictions on their use to secure funding or as collateral but would not be considered readily available since they may not be acceptable at central banks or for other lending programs.
- (4) Includes bank-owned liquid assets and securities received as collateral from off-balance sheet securities financing, margin lending, and derivative transactions. Includes \$21.7 billion (2016: \$19.5 billion) of collateral received through reverse repurchase transactions that cannot be rehypothecated in its current legal form.
- (5) Amounts have been revised from those previously presented.
- (6) The Pledged as collateral amounts relate to OTC and exchange-traded derivative transactions.

Funding

Funding strategy

Core funding, comprising capital, longer-term wholesale liabilities and a diversified pool of personal and, to a lesser extent, commercial and institutional deposits, is the foundation of our structural liquidity position.

Deposit and funding profile

As at October 31, 2017, relationship-based deposits, which are the primary source of funding for retail loans and mortgages, were \$525 billion or 54% of our total funding (October 31, 2016 – \$506 billion or 55%). The remaining portion is comprised of short- and long-term wholesale funding.

Funding for highly liquid assets consists primarily of short-term wholesale funding that reflects the monetization period of those assets. Long-term wholesale funding is used mostly to fund less liquid wholesale assets and to support liquidity asset buffers.

For further details on our wholesale funding, refer to the Composition of wholesale funding tables below.

Long-term debt issuance

During 2017, we continued to experience more favourable unsecured wholesale funding access and pricing compared to many of our global peers. We also continued to expand our unsecured long-term funding base by selectively issuing, either directly or through our subsidiaries, \$22.3 billion of term funding in various currencies and markets. Total unsecured long-term funding outstanding decreased \$2.7 billion from the prior year due to maturities.

We primarily use residential mortgage and credit card securitization programs as alternative sources of funding and for liquidity and asset/liability management purposes. Our total secured long-term funding includes outstanding mortgage-backed securities (MBS) sold, covered bonds that are collateralized with residential mortgages, and securities backed by credit card receivables.

Compared to 2016, our outstanding MBS sold decreased \$271 million. Our covered bonds and securitized credit card receivables decreased \$2.7 billion and \$2.3 billion, respectively.

For further details, refer to the Off-balance sheet arrangements section.

(Millions of Canadian dollars)	As at	
	October 31 2017	October 31 2016
Unsecured long-term funding	\$ 96,112	\$ 98,827
Secured long-term funding	64,758	69,971
Commercial mortgage-backed securities sold	1,366	1,297
Subordinated debentures	9,362	9,597
	\$ 171,598	\$ 179,692

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

Our wholesale funding activities are well-diversified by geography, investor segment, instrument, currency, structure and maturity. We maintain an ongoing presence in different funding markets, which allows us to continuously monitor market developments and trends, identify opportunities and risks, and take appropriate and timely actions. We operate longer-term debt issuance registered programs. The following table summarizes these programs with their authorized limits by geography.

Programs by geography

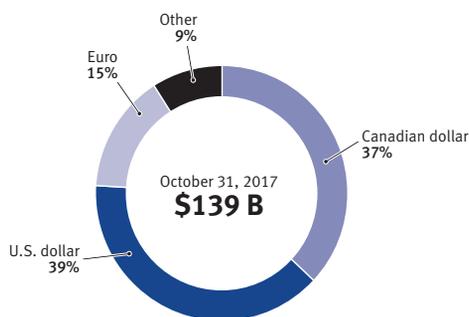
Table 63

Canada	U.S.	Europe/Asia
<ul style="list-style-type: none"> Canadian Shelf Program – \$25 billion 	<ul style="list-style-type: none"> SEC Shelf Program – US\$40 billion SEC Registered Covered Bond Program – US\$15 billion (1) 	<ul style="list-style-type: none"> European Debt Issuance Program – US\$40 billion Global Covered Bond Program – €32 billion Japanese Issuance Programs – ¥1 trillion

(1) Subject to the €32 billion Global Covered Bond Program limit. Upon the enactment of U.S. SEC Regulation AB II on November 23, 2016, we are not currently able to issue new series of SEC-registered covered bonds under the existing program.

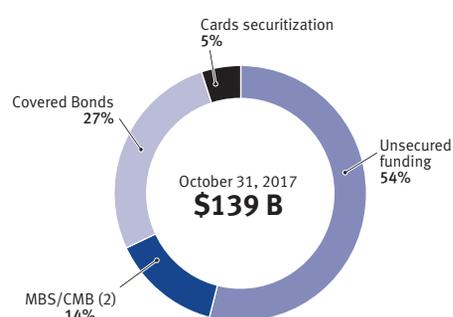
We also raise long-term funding using Canadian Deposit Notes, Canadian NHA MBS, Canada Mortgage Bonds, credit card receivable-backed securities, Kangaroo Bonds (issued in the Australian domestic market by foreign firms) and Yankee Certificates of Deposit (issued in the U.S. domestic market by foreign firms). We continuously evaluate opportunities to expand into new markets and untapped investor segments since diversification expands our wholesale funding flexibility, minimizes funding concentration and dependency, and generally reduces financing costs. As presented in the following charts, our current long-term debt profile is well-diversified by both currency and product. Maintaining competitive credit ratings is also critical to cost-effective funding.

Long-term debt (1) – funding mix by currency of issuance (\$139 billion as at October 31, 2017)



(1) Based on original term to maturity greater than 1 year

Long-term debt (1) – funding mix by product (\$139 billion as at October 31, 2017)



(1) Based on original term to maturity greater than 1 year
 (2) Mortgage-backed securities and Canada Mortgage Bonds

The following table provides our composition of wholesale funding based on remaining term to maturity:

Composition of wholesale funding ⁽¹⁾

Table 64

(Millions of Canadian dollars)	As at October 31, 2017							
	Less than 1 month	1 to 3 months	3 to 6 months	6 to 12 months	Less than 1 year sub-total	1 year to 2 years	2 years and greater	Total
Deposits from banks ⁽²⁾	\$ 5,054	\$ 39	\$ 47	\$ 13	\$ 5,153	\$ –	\$ –	\$ 5,153
Certificates of deposit and commercial paper	1,092	8,801	14,194	13,501	37,588	1,549	39	39,176
Asset-backed commercial paper ⁽³⁾	997	1,385	4,300	5,555	12,237	–	–	12,237
Senior unsecured medium-term notes ⁽⁴⁾	–	2,625	3,402	16,691	22,718	17,311	38,695	78,724
Senior unsecured structured notes ⁽⁵⁾	188	192	980	1,545	2,905	1,332	6,270	10,507
Mortgage securitization	–	571	1,310	1,549	3,430	4,094	12,650	20,174
Covered bonds/asset-backed securities ⁽⁶⁾	–	2,685	1,777	6,179	10,641	10,017	23,925	44,583
Subordinated liabilities	–	–	–	–	–	1,106	8,256	9,362
Other ⁽⁷⁾	4,669	2,005	173	1,488	8,335	5	5,344	13,684
Total	\$ 12,000	\$ 18,303	\$ 26,183	\$ 46,521	\$ 103,007	\$ 35,414	\$ 95,179	\$ 233,600
Of which:								
– Secured	\$ 5,265	\$ 5,541	\$ 7,388	\$ 13,283	\$ 31,477	\$ 14,111	\$ 36,575	\$ 82,163
– Unsecured	6,735	12,762	18,795	33,238	71,530	21,303	58,604	151,437

(Millions of Canadian dollars)	As at October 31, 2016							
	Less than 1 month	1 to 3 months	3 to 6 months	6 to 12 months	Less than 1 year sub-total	1 year to 2 years	2 years and greater	Total
Deposits from banks ⁽²⁾	\$ 1,375	\$ 80	\$ 30	\$ 38	\$ 1,523	\$ –	\$ –	\$ 1,523
Certificates of deposit and commercial paper	3,072	8,950	10,692	5,199	27,913	1,220	54	29,187
Asset-backed commercial paper ⁽³⁾	1,503	1,600	3,551	2,923	9,577	–	–	9,577
Senior unsecured medium-term notes ⁽⁴⁾	1,135	9,140	7,582	7,282	25,139	18,156	43,073	86,368
Senior unsecured structured notes ⁽⁵⁾	141	305	213	554	1,213	1,871	6,493	9,577
Mortgage securitization	–	686	514	1,435	2,635	3,432	14,378	20,445
Covered bonds/asset-backed securities ⁽⁶⁾	–	1,674	626	5,834	8,134	10,700	30,692	49,526
Subordinated liabilities	–	–	–	128	128	–	9,469	9,597
Other ⁽⁷⁾	1,173	2,053	43	738	4,007	13	5,073	9,093
Total	\$ 8,399	\$ 24,488	\$ 23,251	\$ 24,131	\$ 80,269	\$ 35,392	\$ 109,232	\$ 224,893
Of which:								
– Secured	\$ 2,502	\$ 5,528	\$ 4,691	\$ 10,192	\$ 22,913	\$ 14,132	\$ 45,071	\$ 82,116
– Unsecured	5,897	18,960	18,560	13,939	57,356	21,260	64,161	142,777

(1) Excludes bankers' acceptances and repos.

(2) Only includes deposits raised by treasury. Excludes deposits associated with services we provide to these banks (e.g., custody, cash management).

(3) Only includes consolidated liabilities, including our collateralized commercial paper program.

(4) Includes deposit notes.

(5) Includes notes where the payout is tied to movements in foreign exchange, commodities and equities.

(6) Includes credit card, auto and mortgage loans.

(7) Includes tender option bonds (secured) of \$5,168 million (October 31, 2016 – \$2,567 million), bearer deposit notes (unsecured) of \$3,342 million (October 31, 2016 – \$1,652 million) and other long-term structured deposits (unsecured) of \$5,176 million (October 31, 2016 – \$4,874 million).

Credit ratings

Our ability to access unsecured funding markets and to engage in certain collateralized business activities on a cost-effective basis are primarily dependent upon maintaining competitive credit ratings. Credit ratings and outlooks provided by rating agencies reflect their views and methodologies. Ratings are subject to change, based on a number of factors including, but not limited to, our financial strength, competitive position, liquidity and other factors not completely within our control.

The following table presents our major credit ratings⁽¹⁾:

Credit ratings		Table 65		
As at November 28, 2017				
	Short-term debt	Senior long-term debt	Outlook	
Moody's ⁽²⁾	P-1	A1	negative	
Standard & Poor's ⁽³⁾	A-1+	AA-	negative	
Fitch Ratings ⁽⁴⁾	F1+	AA	stable	
DBRS ⁽⁵⁾	R-1(high)	AA	stable	

- (1) Credit ratings are not recommendations to purchase, sell or hold a financial obligation inasmuch as they do not comment on market price or suitability for a particular investor. Ratings are determined by the rating agencies based on criteria established from time to time by them, and are subject to revision or withdrawal at any time by the rating organization.
- (2) On May 10, 2017, Moody's lowered our senior long-term debt rating one notch, along with our large Canadian peers, due to Moody's change to Canada's macroeconomic profile. Moody's also affirmed our negative outlook.
- (3) On June 6, 2016, S&P revised our outlook to negative from stable.
- (4) On October 27, 2017, Fitch Ratings revised our outlook to stable from negative.
- (5) On July 31, 2017, DBRS revised our outlook to stable from negative.

Additional contractual obligations for rating downgrades

We are required to deliver collateral to certain counterparties in the event of a downgrade to our current credit rating. The following table presents the additional collateral obligations required at the reporting date in the event of a one-, two- or three-notch downgrade to our credit ratings. These additional collateral obligations are incremental requirements for each successive downgrade and do not represent the cumulative impact of multiple downgrades. The amounts reported change periodically as a result of several factors, including the transfer of trading activity to centrally cleared financial market infrastructures and exchanges, the expiration of transactions with downgrade triggers, the imposition of internal limitations on new agreements to exclude downgrade triggers, as well as normal course mark-to-market of positions with collateralized counterparties moving from a negative to a positive position. There is no outstanding senior debt issued in the market that contains rating triggers that would lead to early repayment of principal.

Additional contractual obligations for rating downgrades

Table 66

	As at					
	October 31 2017			October 31 2016		
	One-notch downgrade	Two-notch downgrade	Three-notch downgrade	One-notch downgrade	Two-notch downgrade	Three-notch downgrade
(Millions of Canadian dollars)						
Contractual derivatives funding or margin requirements	\$ 61	\$ 102	\$ 307	\$ 487	\$ 117	\$ 501
Other contractual funding or margin requirements ⁽¹⁾	231	100	–	293	473	–

- (1) Includes GICs issued by our municipal markets business out of New York.

Liquidity Coverage Ratio (LCR)

The LCR is a Basel III metric that measures the sufficiency of high-quality liquid assets (HQLA) available to meet liquidity needs over a 30-day period in an acute stress scenario. The Basel Committee on Banking Supervision (BCBS) and OSFI regulatory minimum coverage level for LCR is currently 100%.

OSFI requires Canadian banks to disclose the LCR using the standard Basel disclosure template and calculated using the average of daily LCR positions during the quarter.

Liquidity coverage ratio ⁽¹⁾

Table 67

	For the three-months ended			
	October 31 2017		October 31 2016	
	Total unweighted value (average) ⁽²⁾	Total weighted value (average)	Total unweighted value (average) ⁽²⁾	Total weighted value (average)
(Millions of Canadian dollars, except percentage amounts)				
High-quality liquid assets				
Total high-quality liquid assets (HQLA)		211,735		207,541
Cash outflows				
Retail deposits and deposits from small business customers, of which:				
<i>Stable deposits</i> ⁽³⁾	243,794	19,118	224,518	17,372
<i>Less stable deposits</i>	75,160	2,255	72,570	2,177
<i>Less stable deposits</i>	168,634	16,863	151,948	15,195
Unsecured wholesale funding, of which:	260,993	117,451	234,455	99,877
<i>Operational deposits (all counterparties) and deposits in networks of cooperative banks</i> ⁽⁴⁾	106,980	25,775	106,040	25,491
<i>Non-operational deposits</i>	137,475	75,138	113,719	59,690
<i>Unsecured debt</i>	16,538	16,538	14,696	14,696
Secured wholesale funding		18,735		26,069
Additional requirements, of which:	229,048	74,047	226,706	67,106
<i>Outflows related to derivative exposures and other collateral requirements</i>	61,901	41,364	59,910	34,299
<i>Outflows related to loss of funding on debt products</i>	7,108	7,108	5,364	5,364
<i>Credit and liquidity facilities</i>	160,039	25,575	161,432	27,443
Other contractual funding obligations ⁽⁵⁾	26,252	26,252	30,951	30,951
Other contingent funding obligations ⁽⁶⁾	429,706	6,902	448,854	6,814
Total cash outflows		262,505		248,189
Cash inflows				
Secured lending (e.g., reverse repos)	138,867	28,062	126,615	31,978
Inflows from fully performing exposures	11,626	8,310	10,559	7,042
Other cash inflows	51,878	51,878	45,207	45,207
Total cash inflows		88,250		84,227
		Total adjusted value		Total adjusted value
Total HQLA		211,735		207,541
Total net cash outflows		174,255		163,962
Liquidity coverage ratio		122%		127%

(1) The LCR is calculated in accordance with OSFI's LAR guideline, which, in turn, reflects liquidity-related requirements issued by the BCBS. Effective in the first quarter of 2017, OSFI requires Canadian banks to disclose the LCR based on the average of daily positions during the quarter. Previously, the disclosed LCR was based on the average month-end positions during the quarter. The LCR for the quarter ended October 31, 2017 is calculated as an average of 63 daily positions.

(2) With the exception of other contingent funding obligations, unweighted inflow and outflow amounts are items maturing or callable in 30 days or less. Other contingent funding obligations also include debt securities with remaining maturity greater than 30 days.

(3) As defined by the BCBS, stable deposits from retail and small business customers are deposits that are insured and are either held in transactional accounts or the bank has an established relationship with the client making the withdrawal unlikely.

(4) Operational deposits from non-retail and non-small and medium-sized enterprise customers are deposits which clients need to keep with the bank in order to facilitate their access and ability to use payment and settlement systems primarily for clearing, custody and cash management activities.

(5) Other contractual funding obligations primarily include outflows from unsettled securities trades and outflows from obligations related to securities sold short.

(6) Other contingent funding obligations include outflows related to other off-balance sheet facilities that carry low LCR runoff factors (0% – 5%).

We manage our LCR position within a target range that reflects our liquidity risk tolerance and takes into account business mix, asset composition and funding capabilities. The range is subject to periodic review in light of changes to internal requirements and external developments.

We maintain HQLAs in major currencies with dependable market depth and breadth. Our treasury management practices ensure that the levels of HQLA are actively managed to meet target LCR objectives. Our Level 1 assets, as calculated according to OSFI LAR and the BCBS LCR requirements, represent 82% of total HQLA. These assets consist of cash, placements with central banks and highly rated securities issued or guaranteed by governments, central banks and supranational entities.

LCR captures cash flows from on- and off-balance sheet activities that are either expected or could potentially occur within 30 days in an acute stress scenario. Cash outflows result from the application of withdrawal and non-renewal factors to demand and term deposits, differentiated by client type (wholesale, retail and small- and medium-sized enterprises). Cash outflows also arise from business activities that create contingent funding and collateral requirements, such as repo funding, derivatives, short sales of securities and the extension of credit and liquidity commitments to clients. Cash inflows arise primarily from maturing secured loans, interbank loans and non-HQLA securities.

LCR does not reflect any market funding capacity that we believe would be available in a stress situation. All maturing wholesale debt is assigned 100% outflow in the LCR calculation.

Q4 2017 vs. Q4 2016

The average LCR for the quarter ended October 31, 2017 of 122% was generally consistent with prior quarters and translates into a surplus of approximately \$37 billion. Compared to the prior year, the average LCR decreased 5%, mainly due to expected balance sheet growth and optimization of surplus liquidity.

Contractual maturities of financial assets, financial liabilities and off-balance sheet items

The following tables provide remaining contractual maturity profiles of all our assets, liabilities, and off-balance sheet items at their carrying value (e.g., amortized cost or fair value) at the balance sheet date. Off-balance sheet items are allocated based on the expiry date of the contract.

Details of contractual maturities and commitments to extend funds are a source of information for the management of liquidity risk. Among other purposes, these details form a basis for modelling a behavioural balance sheet with effective maturities to calculate liquidity risk measures. For further details, refer to the Risk measurement section.

Contractual maturities of financial assets, financial liabilities and off-balance sheet items

Table 68

(Millions of Canadian dollars)	As at October 31, 2017									Total
	Less than 1 month	1 to 3 months	3 to 6 months	6 to 9 months	9 to 12 months	1 year to 2 years	2 years to 5 years	5 years and greater	With no specific maturity	
Assets										
Cash and deposits with banks	\$ 58,675	\$ 27	\$ 22	\$ 4	\$ -	\$ -	\$ -	\$ -	\$ 2,341	\$ 61,069
Securities										
Trading (1)	88,083	9	72	3	12	91	61	6,374	32,952	127,657
Available-for-sale	1,748	4,690	4,145	2,552	1,545	9,608	24,445	40,772	1,217	90,722
Assets purchased under reverse repurchase agreements and securities borrowed	106,342	47,726	26,207	13,696	14,327	6,624	-	-	6,055	220,977
Loans (net of allowance for loan losses)	15,228	16,024	23,572	27,220	24,086	104,059	206,201	40,028	86,199	542,617
Other										
Customers' liability under acceptances	10,825	5,541	77	-	-	11	5	-	-	16,459
Derivatives	5,619	10,004	4,530	3,290	2,849	9,351	19,459	39,919	2	95,023
Other financial assets	24,577	767	523	90	88	183	184	1,697	1,243	29,352
Total financial assets	\$ 311,097	\$ 84,788	\$ 59,148	\$ 46,855	\$ 42,907	\$ 129,927	\$ 250,355	\$ 128,790	\$ 130,009	\$ 1,183,876
Other non-financial assets	1,820	1,204	92	337	229	745	1,814	986	21,750	28,977
Total assets	\$ 312,917	\$ 85,992	\$ 59,240	\$ 47,192	\$ 43,136	\$ 130,672	\$ 252,169	\$ 129,776	\$ 151,759	\$ 1,212,853
Liabilities and equity										
Deposits (2)										
Unsecured borrowing	\$ 40,373	\$ 24,425	\$ 33,825	\$ 35,891	\$ 30,641	\$ 34,737	\$ 48,980	\$ 14,709	\$ 429,152	\$ 692,733
Secured borrowing	1,156	3,989	6,289	5,799	4,064	10,178	20,495	7,659	-	59,629
Covered bonds	-	1,898	1,107	1,331	4,862	7,118	19,732	1,225	-	37,273
Other										
Acceptances	10,825	5,541	77	-	-	11	5	-	-	16,459
Obligations related to securities sold short	30,008	-	-	-	-	-	-	-	-	30,008
Obligations related to assets sold under repurchase agreements and securities loaned	98,409	32,026	4,374	-	93	-	12	-	8,170	143,084
Derivatives	5,765	9,436	4,787	3,388	3,038	9,410	16,924	39,378	1	92,127
Other financial liabilities	25,137	1,118	466	222	296	138	366	3,532	574	31,849
Subordinated debentures	-	-	-	-	-	106	207	8,952	-	9,265
Total financial liabilities	\$ 211,673	\$ 78,433	\$ 50,925	\$ 46,631	\$ 42,994	\$ 61,698	\$ 106,721	\$ 75,455	\$ 437,897	\$ 1,112,427
Other non-financial liabilities	835	3,910	312	135	180	2,747	920	9,170	7,789	25,998
Equity	-	-	-	-	-	-	-	-	74,428	74,428
Total liabilities and equity	\$ 212,508	\$ 82,343	\$ 51,237	\$ 46,766	\$ 43,174	\$ 64,445	\$ 107,641	\$ 84,625	\$ 520,114	\$ 1,212,853
Off-balance sheet items										
Financial guarantees	\$ 511	\$ 2,986	\$ 1,428	\$ 2,768	\$ 1,279	\$ 1,792	\$ 6,450	\$ 1,486	\$ 46	\$ 18,746
Lease commitments	63	125	182	181	181	720	1,471	2,859	-	5,782
Commitments to extend credit	4,532	4,000	7,735	12,105	9,198	26,719	141,732	15,260	7,176	228,457
Other credit-related commitments	526	801	1,185	1,521	1,274	412	749	246	101,863	108,577
Other commitments	38	-	-	-	-	-	-	-	442	480
Total off-balance sheet items	\$ 5,670	\$ 7,912	\$ 10,530	\$ 16,575	\$ 11,932	\$ 29,643	\$ 150,402	\$ 19,851	\$ 109,527	\$ 362,042

- (1) Trading debt securities classified as fair value through profit or loss have been included in the less than 1 month category as there is no expectation to hold these assets to their contractual maturity.
- (2) A major portion of relationship-based deposits are repayable on demand or at short notice on a contractual basis while, in practice, these customer balances form a core base for our operations and liquidity needs, as explained in the preceding Deposit and funding profile.

As at October 31, 2016

(Millions of Canadian dollars)	Less than 1 month	1 to 3 months	3 to 6 months	6 to 9 months	9 to 12 months	1 year to 2 years	2 years to 5 years	5 years and greater	With no specific maturity	Total
Assets										
Cash and deposits with banks	\$ 38,931	\$ 342	\$ 2	\$ -	\$ 192	\$ -	\$ -	\$ -	\$ 3,313	\$ 42,780
Securities										
Trading (1)	98,843	5	18	-	24	40	117	6,183	46,062	151,292
Available-for-sale	1,648	4,854	2,011	1,810	1,687	8,869	25,709	36,587	1,626	84,801
Assets purchased under reverse repurchase agreements and securities borrowed	81,801	42,092	24,771	14,988	11,090	3,380	303	-	7,877	186,302
Loans (net of allowance for loan losses)	15,526	13,154	16,863	21,512	23,120	109,075	198,054	38,887	85,413	521,604
Other										
Customers' liability under acceptances	8,362	4,403	73	3	-	-	2	-	-	12,843
Derivatives	8,443	10,367	4,800	3,355	3,511	12,794	26,563	49,099	12	118,944
Other financial assets	28,659	741	484	222	62	43	38	414	1,372	32,035
Total financial assets	\$ 282,213	\$ 75,958	\$ 49,022	\$ 41,890	\$ 39,686	\$ 134,201	\$ 250,786	\$ 131,170	\$ 145,675	\$ 1,150,601
Other non-financial assets	1,259	887	130	295	237	2,579	1,824	2,991	19,455	29,657
Total assets	\$ 283,472	\$ 76,845	\$ 49,152	\$ 42,185	\$ 39,923	\$ 136,780	\$ 252,610	\$ 134,161	\$ 165,130	\$ 1,180,258
Liabilities and equity										
Deposits (2)										
Unsecured borrowing	\$ 30,680	\$ 35,333	\$ 35,540	\$ 16,684	\$ 23,586	\$ 34,044	\$ 55,239	\$ 15,123	\$ 415,130	\$ 661,359
Secured borrowing	1,545	4,788	4,947	5,700	2,290	7,256	20,660	8,569	-	55,755
Covered bonds	-	-	-	-	3,348	9,376	24,936	2,815	-	40,475
Other										
Acceptances	8,362	4,403	73	3	-	-	2	-	-	12,843
Obligations related to securities sold short	50,369	-	-	-	-	-	-	-	-	50,369
Obligations related to assets sold under repurchase agreements and securities loaned (3)	61,170	31,499	1,568	-	756	8	21	-	8,419	103,441
Derivatives	7,334	10,904	5,809	3,939	2,976	13,562	25,945	46,081	-	116,550
Other financial liabilities	22,700	2,212	375	125	218	154	290	4,762	482	31,318
Subordinated debentures	-	-	-	-	-	-	115	9,647	-	9,762
Total financial liabilities	\$ 182,160	\$ 89,139	\$ 48,312	\$ 26,451	\$ 33,174	\$ 64,400	\$ 127,208	\$ 86,997	\$ 424,031	\$ 1,081,872
Other non-financial liabilities	863	3,692	276	155	154	1,199	2,466	9,408	8,561	26,774
Equity	-	-	-	-	-	-	-	-	71,612	71,612
Total liabilities and equity	\$ 183,023	\$ 92,831	\$ 48,588	\$ 26,606	\$ 33,328	\$ 65,599	\$ 129,674	\$ 96,405	\$ 504,204	\$ 1,180,258
Off-balance sheet items										
Financial guarantees	\$ 736	\$ 2,255	\$ 1,897	\$ 3,199	\$ 1,251	\$ 3,010	\$ 6,403	\$ 79	\$ 56	\$ 18,886
Lease commitments	62	123	184	181	177	661	1,528	2,131	-	5,047
Commitments to extend credit	3,723	5,481	9,783	7,190	12,074	31,384	132,092	18,284	3,220	223,231
Other credit-related commitments	433	791	1,420	1,339	1,158	678	758	306	90,241	97,124
Other commitments	477	63	-	-	-	-	-	-	-	540
Total off-balance sheet items	\$ 5,431	\$ 8,713	\$ 13,284	\$ 11,909	\$ 14,660	\$ 35,733	\$ 140,781	\$ 20,800	\$ 93,517	\$ 344,828

- (1) Trading debt securities classified as fair value through profit or loss have been included in the less than 1 month category as there is no expectation to hold these assets to their contractual maturity.
- (2) A major portion of relationship-based deposits are repayable on demand or at short notice on a contractual basis while, in practice, these customer balances form a core base for our operations and liquidity needs, as explained in the preceding Deposit and funding profile.
- (3) Amounts have been revised from those previously presented.

Contractual maturities of financial liabilities and off-balance sheet items – undiscounted basis

The following tables provide remaining contractual maturity analysis of our financial liabilities and off-balance sheet items. The amounts disclosed in the following table are the contractual undiscounted cash flows of all financial liabilities (e.g., par value or amount payable upon maturity). The amounts do not reconcile directly with those in our consolidated balance sheets as the table incorporates only cash flows relating to payments on maturity and do not recognize premiums, discounts or mark-to-market adjustments recognized in the instruments' carrying values as at the balance sheet date. Financial liabilities are based upon the earliest period in which they are required to be paid. For off-balance sheet items, the undiscounted cash flows potentially payable under financial guarantees and commitments to extend credit are classified on the basis of the earliest date they can be called.

(Millions of Canadian dollars)	As at October 31, 2017					
	On demand	Within 1 year	1 year to 2 years	2 years to 5 years	5 years and greater	Total
Financial liabilities						
Deposits (1)	\$ 372,108	\$ 253,825	\$ 52,026	\$ 89,456	\$ 22,280	\$ 789,695
Other						
Acceptances	–	16,443	10	6	–	16,459
Obligations related to securities sold short	–	30,009	–	–	–	30,009
Obligations related to assets sold under repurchase agreements and securities loaned	8,171	134,904	–	12	–	143,087
Other liabilities	1,124	26,730	78	261	3,553	31,746
Subordinated debentures	–	–	106	207	8,952	9,265
	381,403	461,911	52,220	89,942	34,785	1,020,261
Off-balance sheet items						
Financial guarantees (2)	\$ 18,569	\$ 177	\$ –	\$ –	\$ –	\$ 18,746
Lease commitments	–	732	720	1,471	2,859	5,782
Commitments to extend credit (2)	187,078	41,369	9	1	–	228,457
	205,647	42,278	729	1,472	2,859	252,985
Total financial liabilities and off-balance sheet items	\$ 587,050	\$ 504,189	\$ 52,949	\$ 91,414	\$ 37,644	\$ 1,273,246

(Millions of Canadian dollars) (3)	As at October 31, 2016					
	On demand	Within 1 year	1 year to 2 years	2 years to 5 years	5 years and greater	Total
Financial liabilities						
Deposits (1)	\$ 358,254	\$ 221,852	\$ 50,293	\$ 100,295	\$ 25,422	\$ 756,116
Other						
Acceptances	–	12,842	–	1	–	12,843
Obligations related to securities sold short	–	50,366	–	–	–	50,366
Obligations related to assets sold under repurchase agreements and securities loaned	8,420	95,005	8	21	–	103,454
Other liabilities	445	24,198	112	289	4,761	29,805
Subordinated debentures	–	–	–	115	9,646	9,761
	367,119	404,263	50,413	100,721	39,829	962,345
Off-balance sheet items						
Financial guarantees (2)	\$ 18,689	\$ 197	\$ –	\$ –	\$ –	\$ 18,886
Lease commitments	–	727	661	1,528	2,131	5,047
Commitments to extend credit (2)	181,496	41,671	5	59	–	223,231
	200,185	42,595	666	1,587	2,131	247,164
Total financial liabilities and off-balance sheet items	\$ 567,304	\$ 446,858	\$ 51,079	\$ 102,308	\$ 41,960	\$ 1,209,509

* This table represents an integral part of our 2017 Annual Consolidated Financial Statements.

- (1) A major portion of relationship-based deposits are repayable on demand or at short notice on a contractual basis while, in practice, these customer balances form a core base for our operations and liquidity needs, as explained in the preceding Deposit and funding profile.
- (2) We believe that it is highly unlikely that all or substantially all of these guarantees and commitments will be drawn or settled within one year, and contracts may expire without being drawn or settled. The management of the liquidity risk associated with potential extensions of funds is outlined in the preceding Risk measurement section.
- (3) Amounts have been revised from those previously presented.

Insurance risk

Insurance risk refers to the potential financial loss that may arise where the amount, timing and/or frequency of benefit payments under insurance and reinsurance contracts are different than expected. Insurance risk is distinct from those risks covered by other parts of our risk management framework (e.g., credit, market and operational risk) where those risks are ancillary to, or accompany the risk transfer. The four insurance sub-risks are: morbidity, mortality, longevity and travel risk.

Our Insurance Risk Framework provides an overview of our processes and tools for identifying, assessing, managing, mitigating and reporting on the insurance risks that face the organization. These are also supported by our robust three lines of defence governance structure.

Execution risk drivers

Operational risk

Operational risk is the risk of loss or harm resulting from people, inadequate or failed internal processes and systems or from external events.

Operational risk is inherent in all our activities, including the practices and controls used to manage other risks. Failure to manage operational risk can result in direct or indirect financial loss, reputational impact, regulatory censure, or failure in the management of other risks such as credit or market risk.

Our management of operational risk follows our established three lines of defence governance model. This model encompasses the organizational roles and responsibilities for a co-ordinated enterprise-wide approach for the management of operational risk. For further details, refer to the Risk management – Enterprise risk management section.

Operational Risk Framework

We have put in place an Enterprise Operational Risk Framework, which is founded on the principles of our Enterprise Risk Management Framework and sets out the processes to identify, assess, manage, monitor and report operational risk. The processes are established through the following core programs:

- *Internal events* – Internal events are specific instances where operational risk leads to or could have led to an unintended, identifiable impact. The internal events program provides a structured and consistent approach for collecting and analyzing internal event data to facilitate the analysis of the operational risk events affecting us.
- *External events* – External events are operational risk events that affect institutions other than RBC. External event monitoring and analysis is critical to gain awareness of operational risk experience within the industry and to identify emerging industry trends.
- *Business Environment and Internal Control Factors (BEICF) Assessments* – BEICF Assessments are conducted to improve business decision-making by gaining awareness of the key risks and the strengths and vulnerabilities of internal controls. Key BEICF Assessment processes include: risk and control self-assessments conducted at both enterprise and business levels; change initiatives and new/amended product assessments conducted to ensure understanding of the risk and reward trade-off for initiatives (e.g., new products, acquisitions, changes in business processes, implementation of new technology, etc.) and that we do not assume risks not aligned with our risk appetite.
- *Scenario analysis* – Scenario analysis is a structured and disciplined process for making reasonable assessments of infrequent, yet plausible, severe operational risk events. Understanding how vulnerable we are to such “tail risks” identifies mitigating actions and informs the determination of related operational risk thresholds as part of the articulation of operational risk appetite.
- *BEICF monitoring* – BEICF monitoring is conducted on an ongoing basis through key risk indicators (KRIs) and other assurance/monitoring programs (e.g., business unit monitoring, second line of defence monitoring, audit results, etc.).

Conclusions from the operational risk programs enable learning based on “what has happened to us, could it happen again elsewhere in RBC and what controls do we need to amend or implement,” support the articulation of operational risk appetite and are used to inform the overall level of exposure to operational risk, which defines our operational risk profile. The profile includes significant operational risk exposures, potential new and emerging exposures and trends, and overall conclusions on the control environment and risk outlook. We proactively identify and investigate corporate insurance opportunities to mitigate and reduce potential future impacts of operational risk.

We consider risk/reward decisions in striking the balance between accepting potential losses versus incurring costs of mitigation, the expression of which is in the form of our operational risk appetite. Our operational risk appetite is established at the board level and cascaded throughout each of our business segments.

Management reports have been implemented at various levels in order to support proactive management of operational risk and transparency of risk exposures. Reports are provided on a regular basis and provide detail on the main drivers of the risk status and trend for each of our business segments and RBC overall. In addition, changes to the operational risk profile that are not aligned to our business strategy or operational risk appetite are identified and discussed.

Our operations expose us to many different operational risks, which may adversely affect our businesses and financial results. The following list is not exhaustive, as other factors could also adversely affect our results.

Risk	Description
<p>Information Technology and Cyber Risks</p> 	<p>We use information technology for business operations and the enablement of strategic business goals and objectives. Information technology risk is the risk to our business associated with the use, ownership, operation, involvement, influence and adoption of information technology within the enterprise. It consists of information technology related events (e.g., cybersecurity incidents, including data breaches) that could have a material adverse impact on our business. Such events could result in business interruption, service disruptions, theft of intellectual property and confidential information, litigation and reputational damage. To manage our information technology risk, we have established an enterprise-wide Information Technology Risk Management Framework and we continue to develop advancements in cyber defence capabilities to support our business model and protect our clients.</p>
<p>Third Party Risk</p> 	<p>Failing to effectively manage our service providers may expose us to service disruptions, regulatory action, financial loss, litigation or reputational damage. Third-party and outsourcing risk has received increased oversight from regulators and attention from the media. We formalized and standardized our expectations of our suppliers with a principles-based supplier code of conduct to ensure their behaviour aligns with our standards in the following key areas: business integrity, responsible business practices, responsible treatment of individuals, and the environment.</p>
<p>Processing and Execution Risk</p> 	<p>Processing and execution risk is the risk of failure to effectively design, implement and execute a process. Exposure to this risk is global, existing in all of our locations and operations, and in our employee's actions. Examples of processing and execution events range from selecting the wrong interest rates, duplicating wire payment instructions, processing a foreign exchange transaction incorrectly, underinsuring a property and incorrectly investing funds. The potential impacts of such events include financial loss, legal and regulatory consequences and reputational damage. When identified, these situations are assessed, analyzed and mitigating actions are undertaken.</p>
<p>Fraud Risk</p> 	<p>Fraud risk is defined as the risk of intentional unauthorized activities designed to obtain benefits either from us or assets under our care, or using our products. Fraud can be initiated by one or more parties who can include employees, potential or existing clients, agents, suppliers or outsourcers, or other external parties. We have extensive professional resources allocated for the recovery of lost assets and the improvement of loss avoidance through both enhanced intelligence and aggressive pursuit of those who attack enterprise assets.</p>
<p>Model Risk</p> 	<p>The use of models plays an important role in many of our business activities. We use a variety of models for many purposes, including the valuation of financial products, risk measurement and management of different types of risk. Model risk is the risk of error in the design, development, implementation or subsequent use of models. We have established an enterprise-wide Model Risk Management Policy, including principles, policies and procedures, roles and responsibilities to manage model risk. One of the key factors in the policy to mitigate model risk is independent validation.</p>

Operational risk capital

We received approval from OSFI on May 10, 2016 for the use of the Advance Measurement Approach (AMA) for operational risk capital measurement subject to the application of a Standardized Approach (TSA) floor. We commenced reflecting operational risk capital under the AMA in the third quarter of 2016. As such, we currently perform parallel runs of the TSA and the AMA of determining operational risk capital. Under TSA, operational risk capital is determined based on an OSFI-established percentage of 3 years' average gross income for pre-determined industry standardized business activities. Under AMA, operational risk capital is determined by using our internal Operational Risk Measurement System, which includes internal loss experience, external loss experience, scenario analysis, and Business Environment Internal Control Factors. RBC Bank (Georgia), RBC Caribbean, and City National will continue using TSA. RBC Insurance (including insurance recoveries) is not in the scope of operational risk capital calculations. We do not account for mitigation through insurance or any other risk transfer mechanism in our AMA model.

Operational risk loss events

During 2017, we did not experience any material operational risk loss event. For further details on our contingencies, including litigation, refer to Notes 25 and 26 of our 2017 Annual Consolidated Financial Statements.

Regulatory compliance risk

Regulatory compliance risk is the risk of potential non-conformance with laws, rules, regulations and prescribed practices in any jurisdiction in which we operate. Issues regarding compliance with laws and regulations can arise in a number of areas in a large complex financial institution such as RBC, and are often the result of inadequate or failed internal processes, people or systems.

Laws and regulations are in place to protect the financial and other interests of our clients, investors and the public. As a large-scale global financial institution, we are subject to numerous laws and to extensive and evolving regulation by governmental agencies, supervisory authorities and self-regulatory organizations in Canada, the U.S., Europe and other jurisdictions in which we operate. In recent years, such regulation has become increasingly extensive and complex. In addition, the enforcement of regulatory matters has intensified. Recent resolution of such matters involving other global financial institutions have involved the payment of substantial penalties, agreements with respect to future operation of their business, actions with respect to relevant personnel and guilty pleas with respect to criminal charges.

Operating in this increasingly complex regulatory environment and intense regulatory enforcement environment, we are and have been subject to a variety of legal proceedings, including civil claims and lawsuits, criminal charges, regulatory examinations, investigations, audits and requests for information by various governmental regulatory agencies and law enforcement authorities in various jurisdictions, and we anticipate that our ongoing business activities will give rise to such matters in the future. Changes to laws, including tax laws, regulations or regulatory policies, as well as the changes in how they are interpreted, implemented or enforced, could adversely affect us, for example, by lowering barriers to entry in the businesses in which we operate, increasing our costs of compliance or limiting our activities and ability to execute our strategic plans. Further, there is no assurance that we always will be or will be deemed to be in compliance with laws, regulations or regulatory policies. Accordingly, it is possible that we could receive a judicial or regulatory judgment or decision that results in fines, damages, penalties, and other costs or injunctions, criminal convictions or loss of licences or registrations that would damage our reputation and negatively impact our ability to conduct some of our businesses and our earnings. In addition, we are subject to litigation arising in the ordinary course of our business and the adverse resolution of any litigation could have a significant adverse effect on our results or could give rise to significant reputational damage, which in turn could impact our future business prospects.

Global compliance has developed a Regulatory Compliance Management Framework designed to manage and mitigate the regulatory compliance risks associated with failing to comply with, or adapt to, current and changing laws and regulations in the jurisdictions in which we operate.

Regulatory compliance risk includes the regulatory risks associated with financial crime (which includes, but is not limited to, money laundering, bribery and sanctions), privacy, market conduct, consumer protection, business conduct and prudential requirements. Specific compliance policies, procedures and supporting frameworks have been developed to manage regulatory compliance risk.

Strategic risk drivers

Strategic risk

Strategic risk is the risk that the enterprise or particular business areas will make inappropriate strategic choices, or will be unable to successfully implement selected strategies or related plans and decisions. Business strategy is the major driver of our risk profile and consequently the strategic choices we make in terms of business mix determine how our risk profile changes.

Responsibility for selecting and successfully implementing business strategies is mandated to the individual heads of the businesses. Oversight of strategic risk is the responsibility of the heads of the business segments and their operating committees, the Enterprise Strategy Office, Group Executive, and the Board of Directors. The Enterprise Strategy group supports the management of strategic risk through the strategic planning process (articulated within our Enterprise Strategic Planning Policy) ensuring alignment across our business, financial, capital and risk planning.

Our annual business portfolio review and project approval request processes help identify and mitigate strategic risk by ensuring strategies for new initiatives, lines of business, and the enterprise as a whole align with our risk appetite and risk posture. GRM provides oversight of strategic risk by providing independent review of these processes, establishing enterprise risk frameworks, and independently monitoring and reporting on the level of risk established against our risk appetite metrics in accordance with the three lines of defence governance model.

For details on the key strategic priorities for our business segments, refer to the Business segment results section.

Reputation risk

Reputation risk is the risk that an activity undertaken by an organization or its representatives will impair its image in the community or lower public confidence in it, resulting in the loss of business, legal action or increased regulatory oversight.

Reputation risk can arise from a number of events and primarily occurs in connection with credit risk, regulatory, legal and operational risks and failure to maintain strong risk conduct. Operational failures and non-compliance with laws and regulations can have a significant reputational impact on us.

Our Reputation Risk Framework provides an overview of our approach to the management of this risk. It focuses on our organizational responsibilities, and controls in place to mitigate reputation risks.

The following principles guide our management of reputation risk:

- We must operate with integrity at all times in order to sustain a strong and positive reputation.
- Protecting our reputation is the responsibility of all our employees, including senior management, and this responsibility extends to the Board of Directors.

Legal and regulatory environment risk

Legal and regulatory environment risk is the risk that new or modified laws and regulations, and the interpretation or application of those laws and regulations, will negatively impact the way in which we operate, both in Canada and abroad. The full impact of some of these changes on our business will not be known until final rules are implemented and market practices have developed in response. We continue to respond to these and other developments and are working to minimize any potential adverse business or economic impact. The following provides a high-level summary of some of the key regulatory changes that have potential to increase our operational, compliance, and technology costs and to impact our profitability, as well as to potentially increase the cost and complexity of our operations.

Canadian Housing Market and Consumer Debt

The Government of Canada (GoC) continues to express concerns with the level and sustainability of Canadian household debt. A number of measures to address these concerns have been introduced by both the federal government and a number of provinces, including changes to federal mortgage rules (e.g. changes to OSFI B-20 Guideline). Going forward, other initiatives continue to be explored, such as an assessment by the Department of Finance on a lender risk-sharing model.

Payments Issues

The federal government is engaged in several initiatives that could have an impact on the payment system in Canada. This includes the following: an ongoing review of the interchange framework; a consultation process on the regulatory framework for the retail payments system in Canada; and initiatives under consideration by Payments Canada to modernize the payments system in Canada.

Other Regulatory Initiatives Impacting Financial Services in Canada

The federal government continues to assess a number of issues relating to consumer protection. Previously withdrawn legislative proposals to update the consumer protection framework and to clarify federal jurisdiction in this area continue to be reviewed by the government. In addition, federal regulatory agencies are also undertaking a review of sales practices at Canadian banks and will be providing reports to the government on these issues. Provincial consumer protection initiatives are also being monitored to assess their possible implications from a financial services perspective.

Other regulatory initiatives include a review of the deposit insurance framework by the Department of Finance and the Canada Deposit Insurance Corporation, consultations by the Financial Consumer Agency of Canada on indirect auto lending, and initiatives by the Canadian Securities Administrators to regulate market conduct activities relating to OTC derivatives products.

Negotiations on North American Free Trade Agreement (NAFTA)

Canada, Mexico and the United States are currently engaged in negotiations on potential changes to NAFTA. The existing chapters in NAFTA such as those relating to financial services, cross-border trade, and temporary entry rules, could be changed as a result of these discussions. In addition, there may be efforts made to update the agreement to address new areas like electronic commerce. While the outcome of the negotiations remain unclear, changes to NAFTA may adversely affect certain of our businesses, either directly or indirectly through adverse effects on portions of the Canadian and U.S. economies.

United States Regulatory Initiatives

Policymakers are beginning to consider financial regulatory reforms that could result in reduced cost and complexity of U.S. regulations. These include possible reforms to the Volcker rule that could simplify compliance requirements regarding proprietary trading activity and investments in private equity and hedge funds; revisions to the new fiduciary rule that could have implications for financial services firms, investors and markets; potential changes to the framework for the regulation of OTC derivatives; and ongoing adjustments to key aspects of the capital, leverage, liquidity, and oversight framework in the U.S. (e.g. foreign bank organization rules; comprehensive capital analysis and review requirements; single counterparty credit limits; total loss absorbing capacity rules). In addition, U.S. policymakers are considering reforms to the tax code that could be beneficial in terms of lowering corporate tax rates; however, they are also considering measures to raise revenues to pay for those lower rates, including measures that could target the financial sector and many of its employees, such as: reductions in the deductibility of interest on corporate debt, of mortgage interest, and of state and local taxes; revisions to the tax exemption for interest on municipal debt; changes to tax credits for low-income housing and renewable fuels; changes to the tax treatment of derivatives; and a large-bank tax and/or financial transactions tax. The impact of the Tax Reform Framework, if enacted, could include a reduction in our deferred tax asset and tax reductions on future earnings. Congress may opt for a more modest, and less costly, package of reforms.

Regulatory Capital and Related Requirements

We continue to monitor and prepare for developments related to regulatory capital. The Basel Committee on Banking Supervision (BCBS) has issued a number of proposed revisions and new measures that would reform the manner in which banks calculate, measure and report regulatory capital and related risks, including with respect to the use of banks' own internal risk models. The impact of these proposals on us will depend on the final standards adopted by the BCBS and how these standards are implemented by our regulators. For further details on regulatory capital and related requirements, refer to the Capital Management section.

Canadian Bail-in Regime

Bail-in regimes are being implemented in a number of jurisdictions in an effort to limit taxpayer exposure to losses of a failing institution and ensure the institution's shareholders and creditors remain responsible for bearing such losses. On June 22, 2016, legislation came into force, amending certain federal statutes pertaining to banks to create a bank recapitalization or "bail-in" regime for the six domestic systemically important banks (D-SIBs) in Canada. On June 16, 2017, the Department of Finance announced the publication of draft regulations under the Canada Deposit Insurance Corporation (CDIC) Act and the Bank Act, which provide key details of the conversion, issuance and compensation regimes for bail-in instruments issued by D-SIBs. The proposed regulations provide that, pursuant to the CDIC Act, in circumstances when the Superintendent of Financial Institutions has determined that a bank may no longer be viable, the Governor in Council may, upon a recommendation of the Minister of Finance that he or she is of the opinion that it is in the public interest to do so, grant an order directing the CDIC to convert all or a portion of certain shares and liabilities of that bank into common shares. These changes are not expected to have a material impact on our cost of long-term unsecured funding.

Total Loss Absorbing Capacity (TLAC)

On June 16, 2017, OSFI released a draft guideline on TLAC, which will apply to Canada's D-SIBs as part of the Federal Government's bail-in regime. The draft guideline is consistent with the TLAC standard released on November 9, 2015 by the FSB for institutions designated as global systemically important banks (G-SIBs), but tailored to the Canadian context. The standards are intended to address the sufficiency of a systemically important bank's loss absorbing capacity in supporting its recapitalization in the event of its failure. TLAC is defined as the aggregate of Tier 1 capital, Tier 2 capital, and other TLAC instruments, which allow conversion in whole or in part into common shares under the CDIC Act and meet all of the eligibility criteria under the guideline. We are expected to comply with the disclosure requirements beginning the first quarter of 2019 and the remaining TLAC standard requirements by November 1, 2021. The final guidance is expected to be issued in 2018. We do not anticipate any challenges in meeting these TLAC requirements.

Step-In Risk

On October 25, 2017, the BCBS finalized its guidelines on the identification and management of step-in risk. Step-in risk is the risk that a bank may provide financial support to an unconsolidated entity beyond their contractual obligations, should the entity experience financial distress,

in order to minimize any potential reputational risk to the bank. The guidelines aim to strengthen the oversight and regulation surrounding systemic risks arising from a bank's interaction with shadow banking entities. The guidelines provide that banks will be required to at a minimum annually self-assess their step-in risk based on a number of indicators, including the impact on liquidity and capital positions of stepping in to provide support to an unconsolidated entity. These new guidelines do not impose an automatic liquidity or capital charge for step-in risk but do require banks and supervisors to take appropriate actions to respond to and mitigate material step-in risk as outlined in the guideline. We are reviewing these new guidelines along with future OSFI guidance and incorporating them into our risk management activities as recommended by BCBS. The BCBS expects banks and supervisors to implement the guidelines no later than 2020.

U.K. and European Regulatory Reform

The revised directive and regulation on Markets in Financial Instruments (MiFID II/MiFIR) become effective January 2018 and will have a significant technological and procedural impact for certain businesses operating in the European Union. The reforms will introduce changes to pre- and post-trade transparency, market structure, trade and transaction reporting, algorithmic trading, and conduct of business. The U.K. is in negotiations to exit the European Union. Until those negotiations are concluded, and the resulting changes are implemented, the U.K. will remain a European Union Member State, subject to all European Union legislation.

Other regulatory initiatives include: the General Data Protection Regulation, effective May 2018, introducing significant obligations on data handling globally; the extension of the Senior Managers Regime to all U.K. regulated firms from 2018; the Benchmarks Regulation impacting users of, contributors to, and administrators of benchmarks; and the publication of the Foreign Exchange Global Code, setting out global principles of good practice in foreign exchange markets.

Competitive risk

The competition for clients among financial services companies in the markets in which we operate is intense. Client loyalty and retention can be influenced by a number of factors, including new technology used or services offered by our competitors, relative service levels and prices, product and service attributes, our reputation, actions taken by our competitors, and adherence with competition and anti-trust laws. Other companies, such as insurance companies and non-financial companies, are increasingly offering services traditionally provided by banks. This competition could also reduce net interest income and fee revenue and adversely affect our results.

We identify and assess competitive risks as part of our overall risk management process. Our products and services are regularly benchmarked against existing and potential competitors. In addition, we regularly conduct risk reviews of our products, services, alliances and acquisitions as well as ensure adherence to competition and anti-trust laws. Our annual strategy-setting process also plays an integral role in managing competitive risk.

Macroeconomic risk drivers

Systemic risk

Systemic risk is the risk that the financial system as a whole, or a major part of it – either in an individual country, a region, or globally – is put in real and immediate danger of collapse or serious damage with the likelihood of material damage to the economy, and that this will result in financial, reputation or other risks for us.

Our earnings are significantly affected by the general business and economic conditions in the geographic regions in which we operate. These conditions include consumer saving and spending habits as well as consumer borrowing and repayment patterns, business investment, government spending, exchange rates, sovereign debt risks, the level of activity and volatility of the capital markets, strength of the economy and inflation. For example, an extended economic downturn may result in high unemployment and lower family income, corporate earnings, business investment and consumer spending, and could adversely affect the demand for our loan and other products and result in higher provisions for credit losses. Given the importance of our Canadian operations, an economic downturn in Canada or in the U.S. impacting Canada would largely affect our personal and business lending activities in our Canadian banking businesses, including mortgages and credit cards, and could significantly impact our results of operations.

Our earnings are also sensitive to changes in interest rates, which have increased in Canada and the U.S. over the last year but remain historically low. A continuing low interest rate environment in Canada, the U.S. and globally would result in net interest income being unfavourably impacted by spread compression largely in Personal & Commercial Banking and Wealth Management. While a further increase in interest rates would benefit our businesses that are currently impacted by spread compression, a significant increase in interest rates could also adversely impact household balance sheets. This could result in credit deterioration which might negatively impact our financial results, particularly in some of our Personal & Commercial Banking and Wealth Management businesses.

Deterioration in global capital markets could result in volatility that would impact results in Capital Markets while in Wealth Management, weaker market conditions would lead to lower average fee-based client assets and transaction volumes. In addition, worsening financial and credit market conditions may adversely affect our ability to access capital markets on favourable terms and could negatively affect our liquidity, resulting in increased funding costs and lower transaction volumes in Capital Markets and Investor & Treasury Services.

Systemic risk is considered to be the least controllable risk facing us. Our ability to mitigate this risk when undertaking business activities is limited, other than through collaborative mechanisms between key industry participants, and, as appropriate, the public sector, to reduce the frequency and impact of these risks. The two most significant measures in mitigating the impact of systemic risk are diversification and stress testing.

Our diversified business portfolios, products, activities and funding sources help mitigate the potential impacts from systemic risk. We also mitigate systemic risk by establishing risk limits to ensure our portfolio is well-diversified, and concentration risk is reduced and remains within our risk appetite.

Stress testing involves consideration of the simultaneous movements in a number of risk factors. It is used to ensure our business strategies and capital planning are robust by measuring the potential impacts of credit, market, liquidity and funding and operational risks on us, under adverse economic conditions. Our enterprise-wide stress testing program uses stress scenarios featuring a range of severities based on plausible adverse economic and financial market events. These stress scenarios are evaluated across the organization, and results are integrated to develop an enterprise-wide view of the impacts on our financial results and capital requirements. For further details on our stress testing, refer to the Risk management – Enterprise risk management section.

Overview of other risks

In addition to the risks described in the Risk management section, there are other risk factors, described below, which may adversely affect our businesses and financial results. The following discussion is not exhaustive as other factors could also adversely affect our results.

Government fiscal, monetary and other policies

Our businesses and earnings are affected by monetary policies that are adopted by the Bank of Canada, the Fed in the U.S., the ECB in the European Union and monetary authorities in other jurisdictions in which we operate; as well as the fiscal policies of the governments of Canada, the U.S., Europe and such other jurisdictions. Such policies can also adversely affect our clients and counterparties in Canada, the U.S. and internationally, which may increase the risk of default by such clients and counterparties.

Tax risk and transparency

Tax risk refers to the risk of loss related to unexpected tax liabilities. The tax laws and systems that are applicable to RBC are complex and wide ranging. As a result, we ensure that any decisions or actions related to tax always reflect our assessment of the long-term costs and risks involved, including their impact on our relationship with clients, shareholders, and regulators, and our reputation.

Our approach to tax is governed by our Taxation Policy and Risk Management Framework, and reflects the fundamentals of our Risk Pyramid. Oversight of our tax policy and the management of tax risk is the responsibility of Group Executive, the CFO and the Senior Vice President, Taxation. We discuss our tax position with the Audit Committee on a regular basis and discuss our tax strategy with the Audit and Risk Committees.

Our tax strategy is designed to ensure transparency and support our business strategy, and is aligned with our corporate vision and values. We seek to maximize shareholder value by ensuring that our businesses are structured in a tax-efficient manner while considering reputational risk by being in compliance with all laws and regulations. Our framework seeks to ensure that we:

- Act with integrity and in a straightforward, open and honest manner in all tax matters;
- Ensure tax strategy is aligned with our business strategy supporting only bona fide transactions with a business purpose and economic substance;
- Ensure all intercompany transactions are conducted on arm's length terms;
- Ensure our full compliance and full disclosure to tax authorities of our statutory obligations; and
- Endeavour to work with the tax authorities to build positive long-term relationships and where disputes occur, address them constructively.

With respect to assessing the needs of our clients, we consider a number of factors including the purposes of the transaction. We seek to ensure that we only support bona fide client transactions with a business purpose and economic substance. Should we become aware of client transactions that are aimed at evading their tax obligations, we will not proceed with the transactions.

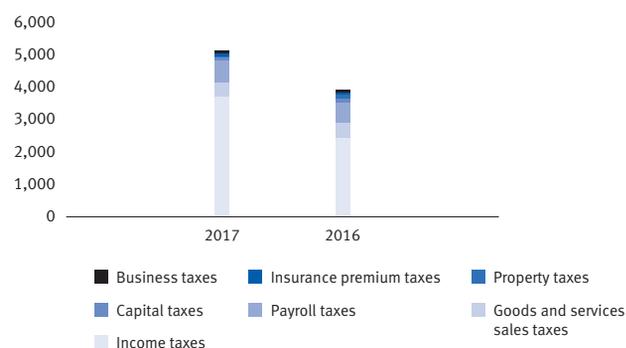
We operate in 37 countries worldwide. Our activities in these countries are subject to both Canadian and international tax legislation and other regulations, and are fully disclosed to the relevant tax authorities. The Taxation group and GRM both regularly review the activities of all entities to ensure compliance with tax requirements and other regulations.

Given that we operate globally, complex tax legislation and accounting principles have resulted in differing legal interpretations between the respective tax authorities we deal with and ourselves, and we are at risk of tax authorities disagreeing with prior positions we have taken for tax purposes. When this occurs, we are committed to an open and transparent dialogue with the tax authorities to ensure a quick assessment and prompt resolution of the issues where possible. Failure to adequately manage tax risk and resolve issues with tax authorities in a satisfactory manner could adversely impact our results, potentially to a material extent in a particular period, and/or significantly impact our reputation.

Tax contribution

In 2017, total income and other tax expense, including income taxes in the Consolidated Statements of Comprehensive Income and Changes in Equity, to various levels of governments globally totalled \$5.1 billion (2016 – \$3.8 billion). In Canada, total income and other tax expense for the year ended October 31, 2017 to various levels of government totalled \$3.9 billion (2016 – \$2.8 billion).

Income and other tax expense – by category
(Millions of Canadian dollars)



Income and other tax expense – by geography
(Millions of Canadian dollars)



For further details on income and other tax expense, refer to the Financial performance section.

Environmental and social risk

Environmental and social (E&S) risk is the risk that an environmental or social issue associated with a client, transaction, product, supplier or activity will create a risk of loss of financial, operational, legal and/or reputational value to RBC. E&S issues include, but are not limited to: site contamination, waste management, land and resource use, biodiversity, water quality and availability, climate change, environmental regulation, human rights, Indigenous Peoples' rights and consultation, and community engagement. GRM is responsible for developing policies to identify, assess, monitor and report on E&S risk, and for their regular review and update. E&S risk policies seek to identify sectors, clients and business activities exposed to E&S risk; apply enhanced due diligence and escalation procedures; and establish requirements to manage,

mitigate and monitor E&S risk. Business segments and corporate functions are responsible for incorporating E&S risk management requirements within their operations.

RBC recognizes the importance of E&S risk management practices and processes and is committed to the regular and transparent disclosure of these. As a signatory to the Equator Principles (EP), we report annually on projects assessed for E&S risk according to the EP framework. As a signatory to the Carbon Disclosure Project, we annually disclose information on climate change risks as well as our energy and emissions performance. In 2017, we published our first Modern Slavery Act Statement, which sets out the steps that RBC has taken to ensure that slavery and human trafficking are not taking place in the supply chains or our businesses. A number of companies in our RBC Global Asset Management business and BlueBay Asset Management LLP are signatories to the United Nations Principles for Responsible Investment and they report annually on their responsible investment activities. Their approach integrates environmental, social and governance issues into the investment process when doing so may have a material impact on investment risk or return. RBC Europe Limited is a signatory to the Green Bond Principles and they report annually on green bond underwriting activities. RBC Corporate Citizenship sets corporate environmental strategy and reports annually on our performance in the Corporate Citizenship Report and Public Accountability Statement.

RBC believes we have a role to play in the transition to a clean, low-carbon economy. We are encouraged by the recent efforts of the Financial Stability Board's (FSB) Task Force on Climate-related Financial Disclosures (TCFD) and are participants in a pilot-test of the TCFD recommendations, which will be coordinated by the United Nations Environment Programme – Finance Initiative (UNEP-FI). We continue to investigate and assess climate-related risks and seek to develop and continually improve our climate-related financial disclosures.

Other factors

Other factors that may affect our results include changes in government trade policy, changes in accounting standards, including their effect on our accounting policies, estimates and judgments, currency and interest rate movements in Canada, the U.S., and other jurisdictions in which we operate, changes to our credit ratings, the timely and successful development of new products and services, technological changes, effective design, implementation and execution of processes and their associated controls, fraud by internal and external parties, the possible impact on our business from disease or illness that affects local, national or global economies, disruptions to public infrastructure, including transportation, communication, power and water, international conflicts and other political developments including those relating to the war on terrorism, and our success in anticipating and managing the associated risks.

We caution that the foregoing discussion of risk factors, many of which are beyond our control, is not exhaustive and other factors could also affect our results.

Capital management

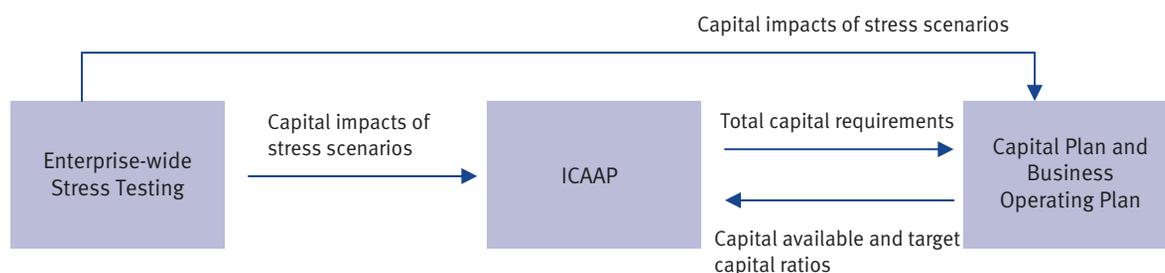
We actively manage our capital to maintain strong capital ratios and high ratings while providing strong returns to our shareholders. In addition to the regulatory requirements, we consider the expectations of credit rating agencies, depositors and shareholders, as well as our business plans, stress tests, peer comparisons and our internal capital ratio targets. Our goal is to optimize our capital usage and structure, and provide support for our business segments and clients and generate better returns for our shareholders, while protecting depositors and senior creditors.

Capital management framework

Our capital management framework establishes policies and processes for defining, measuring, raising and investing all forms of capital in a co-ordinated and consistent manner. It sets our overall approach to capital management, including guiding principles and roles and responsibilities relating to capital adequacy and transactions, dividends, solo capital and management of risk-weighted assets (RWA) and leverage ratio exposures. We manage and monitor capital from several perspectives, including regulatory capital, economic capital and solo capital.

Our capital planning process is dynamic and involves various teams including Finance, Corporate Treasury, GRM, Economics and our businesses, and covers internal capital ratio targets, potential capital transactions as well as projected dividend payouts and share repurchases. This process considers our business operating plans, enterprise-wide stress test and Internal Capital Adequacy Assessment Process (ICAAP), regulatory capital and accounting changes, internal capital requirements, rating agency metrics and solo capital.

Our capital plan is established on an annual basis and is aligned with the management actions included in the annual business operating plan, which includes forecast growth in assets and earnings taking into account our business strategies, the projected market and economic environment, and peer positioning. This includes incorporating potential capital transactions based on our projected internal capital generation, business forecasts, market conditions and other developments, such as accounting and regulatory changes that may impact capital requirements. All of the components in the capital plan are monitored throughout the year and are revised as deemed appropriate.



Our Enterprise-wide stress test and annual ICAAP provide key inputs for capital planning, including setting internal capital ratio targets. The stress scenarios are evaluated across the organization, and results are integrated to develop an enterprise-wide view of financial impacts and capital requirements, which in turn facilitate the planning of mitigating actions to absorb adverse events. ICAAP assesses capital adequacy and requirements covering all material risks, with a cushion for plausible contingencies. In accordance with OSFI guideline, major components of our ICAAP process include comprehensive risk assessment, stress testing, capital assessment and planning (both economic and regulatory), Board and senior management oversight, monitoring and reporting and internal control review.

Our internal capital targets are established to maintain robust capital positions in excess of OSFI's Basel III "all-in" regulatory targets. The stress test results of our Enterprise-wide stress testing and ICAAP are incorporated into the OSFI capital conservation buffer and D-SIBs surcharge, with a view to ensuring the bank has adequate capital to underpin risks and absorb losses under all plausible stress scenarios given our risk profile and appetite. In addition, we include a discretionary cushion on top of OSFI regulatory targets to maintain capital strength for forthcoming regulatory and accounting changes, peer comparatives, rating agencies sensitivities and solo capital level.

The Board of Directors is responsible for the ultimate oversight of capital management, including the annual review and approval of the capital plan. ALCO and GE share responsibility for capital management and receive regular reports detailing our compliance with approved limits and guidelines. The Risk Committee annually approves the Capital Management Framework. The Audit and Risk Committees jointly approve the ICAAP process. The Audit Committee is also responsible for the ongoing review of internal controls over capital management.

Basel III

Our consolidated regulatory capital requirements are determined by guidelines issued by OSFI, which are based on the minimum Basel III capital ratios adopted by the Basel Committee on Banking Supervision (BCBS).

The BCBS sets out the Basel III transitional requirements for Common Equity Tier 1 capital (CET1), Tier 1 capital and Total capital ratios at 5.75%, 7.25% and 9.25%, respectively for 2017, which would be required to be fully phased-in ("all-in") to 7.0%, 8.5% and 10.5%, respectively, by January 1, 2019 (including minimums plus capital conservation buffer of 2.5%). However, other than providing phase-out rules for non-qualifying capital instruments, OSFI required Canadian banks to meet the BCBS Basel III "all-in" targets for CET1, Tier 1 capital and Total capital ratios in 2013. Effective January 1, 2016, we were required to include an additional 1% risk-weighted capital surcharge to each tier of capital for the above all-in requirements given our designation as a D-SIB by OSFI in 2013 (similar to five other Canadian banks designated as D-SIBs).

In 2014, OSFI also advised Canadian banks that it would begin phasing in the Credit Valuation Adjustment (CVA) risk capital charge required under the Basel III framework. In accordance with OSFI's guidance, there are two possible options to phase in the CVA capital charge. Under the option selected by RBC, the 2017 CVA capital charge for CET1, Tier 1 capital and Total capital was 72%, 77%, and 81%, respectively. In 2018, the CVA capital charge will be 80%, 83% and 86%, respectively, and will reach 100% for each tier of capital by 2019.

Under Basel III, banks select from two main approaches, the Standardized Approach or the Internal Ratings Based (IRB) Approach, to calculate their minimum regulatory capital required to support credit, market and operational risks. We adopted the Basel III IRB approach to calculate credit risk capital for consolidated regulatory reporting purposes. While the majority of our credit risk exposures are reported under the Basel III IRB Approach for regulatory capital purposes, certain portfolios continue to use the Basel III Standardized Approach for credit risk (for example, our Caribbean banking operations and City National). For consolidated regulatory reporting of market risk capital, we use both Internal Models-based and Standardized Approaches. For consolidated regulatory reporting of operational risk, we use the higher of the Standardized Approach and the Advanced Measurement Approach. We determine our regulatory leverage ratio based on OSFI's Leverage Requirements (LR) Guideline, which reflects the BCBS Basel III leverage ratio requirements. We are required to maintain a minimum leverage ratio that meets or exceeds 3%.

All federally regulated banks with a Basel III leverage ratio total exposure exceeding €200 billion at their financial year-end are required, at a minimum, to publicly disclose in the first quarter following their year-end, the twelve indicators used in the G-SIB assessment methodology, with the goal of enhancing the transparency of the relative scale of banks' potential global systemic importance and data quality. The FSB publishes an updated list of G-SIBs annually. On November 21, 2017, we were designated a G-SIB in the 2017 FSB list. For further details refer to the Regulatory developments section.

In April 2017, OSFI issued final guidelines for the first phase of the Pillar 3 disclosure requirements, indicating that all D-SIBs are expected to implement the "Revised Pillar 3 Disclosure Requirements", issued by the BCBS in January 2015 for the reporting period ending October 31, 2018 (and referenced by BCBS as phase one). These guidelines replace existing disclosure requirements in the areas of credit risk, counterparty credit risk and securitization activities. We are making progress and expect to meet OSFI's stated timeline.

In March 2017, the BCBS issued its second phase of the Pillar 3 disclosure requirements entitled, "Pillar 3 disclosure requirements – consolidated and enhanced framework". The enhancements include the addition of a dashboard of key metrics and incorporates disclosure requirements related to ongoing reforms to the regulatory environment, such as the TLAC regime for G-SIBs, the proposed operational risk requirements, and the final standard for market risk. The disclosure standard also consolidates all existing Pillar 3 disclosure requirements of the Basel III framework, including the leverage and liquidity ratios disclosure templates. This phase two requirement, together with the phase one Revised Pillar 3 disclosure requirements, issued in January 2015, comprise the single Pillar 3 framework. OSFI has not yet released the implementation date for the BCBS phase two disclosure requirements.

The BCBS has commenced its work on the final phase of the Pillar 3 disclosure requirements, which includes the standardized approach RWA to benchmark internally modelled capital requirements, asset encumbrance, operational risk, and ongoing policy reform.

On August 21, 2017, OSFI announced its intention to delay the domestic implementation of the BCBS frameworks related to the Standardized Approach to Counterparty Credit Risk (SA-CCR) and the revisions to the capital requirements for bank exposures to Central counterparties until Q1 2019. In addition, in its communication, OSFI also announced its intention to delay the implementation of the BCBS Revised Securitization Framework until Q1 2019.

We continue to monitor the finalization of Basel III post-crisis regulatory reforms and assess their expected impact to our capital and leverage ratios. BCBS issued consultation papers on revisions relating to how regulatory capital is calculated under the Basel III Standardized and IRB approaches along with changes to operational risk methodology and the leverage framework. In addition, the BCBS expects to finalize a capital floor based on its revised Standardized Approach. Once these frameworks are finalized, OSFI's guidance will provide implementation timelines. Our aim is to ensure we maintain robust capital ratios in expectation of these pending regulatory changes.

The following table provides a summary of OSFI regulatory target ratios under Basel III:

Basel III – OSFI regulatory target						Table 70	
Basel III Capital ratios and leverage	OSFI regulatory target requirements for large banks under Basel III					RBC capital and leverage ratios as at October 31, 2017	Meet or exceed OSFI regulatory target ratios
	Minimum	Capital Buffers ⁽¹⁾	Minimum including Capital Buffers	D-SIB Surcharge ⁽²⁾	Minimum including Capital Buffers and D-SIB surcharge ⁽²⁾		
Common Equity Tier 1	> 4.5%	2.5%	> 7.0%	1.0%	> 8.0%	10.9%	✓
Tier 1 capital	> 6.0%	2.5%	> 8.5%	1.0%	> 9.5%	12.3%	✓
Total capital	> 8.0%	2.5%	> 10.5%	1.0%	> 11.5%	14.2%	✓
Leverage ratio	> 3.0%	n.a.	> 3.0%	n.a.	> 3.0%	4.4%	✓

(1) The capital buffers include the capital conservation buffer and the countercyclical capital buffer as prescribed by OSFI.

(2) Effective January 1, 2016, the D-SIBs surcharge is applicable to risk-weighted capital.

n.a. not applicable

Regulatory capital, RWA and capital ratios

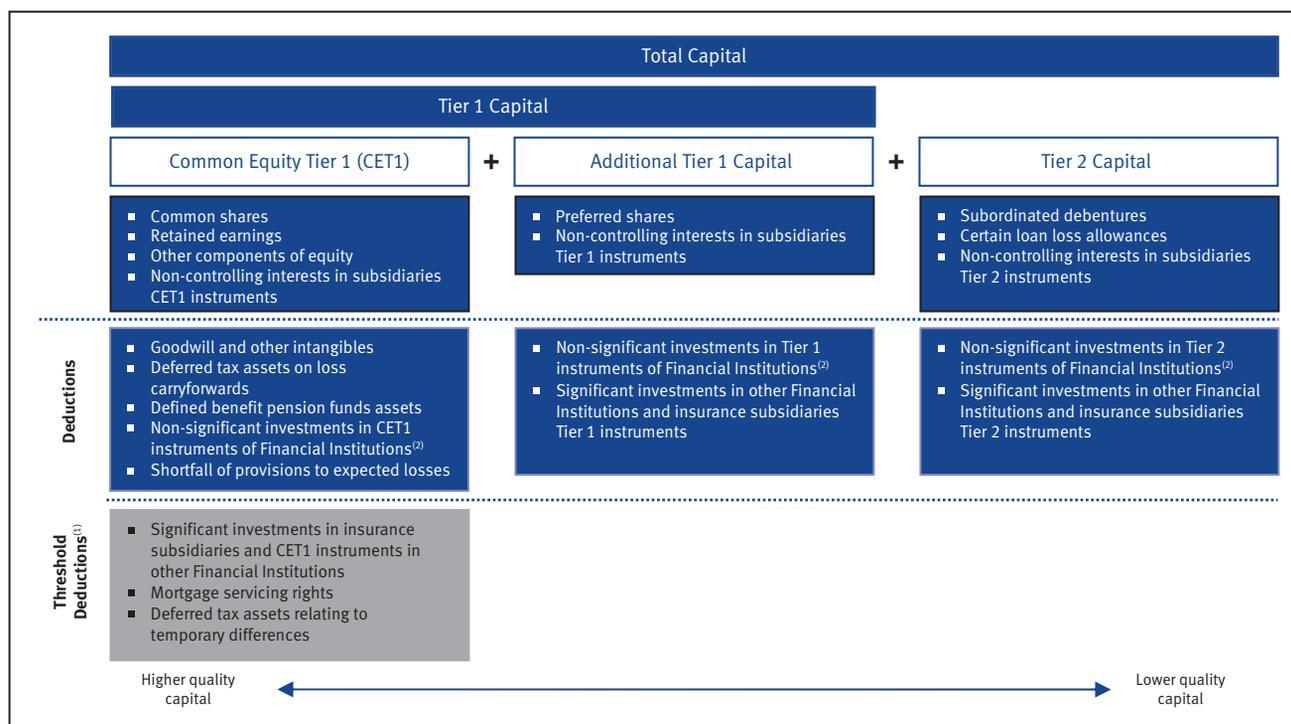
Under Basel III, regulatory capital consists of CET1, Additional Tier 1 and Tier 2 capital.

CET1 capital comprises the highest quality of capital. Regulatory adjustments under Basel III include full deductions of certain items and additional capital components that are subject to threshold deductions.

Tier 1 capital comprises predominantly CET1 and Additional Tier 1 items including non-cumulative preferred shares that meet certain criteria. Tier 2 capital includes subordinated debentures that meet certain criteria, certain loan loss allowances and non-controlling interests in subsidiaries Tier 2 instruments. Total capital is defined as the sum of Tier 1 and Tier 2 capital. Preferred shares and subordinated debentures issued after January 1, 2013 require Non-viability contingent capital requirement (NVCC) features to be included into regulatory capital. NVCC requirements ensure that non-common regulatory capital instruments bear losses before banks seek government funding.

Regulatory capital ratios are calculated by dividing CET1, Tier 1 and Total capital by their respective RWA.

The following chart provides a summary of the major components of CET1, Additional Tier 1 and Tier 2 capital.



(1) First level: The amount by which each of the items exceeds a 10% threshold of CET1 capital (after all deductions but before threshold deductions) will be deducted from CET1 capital. Second level: The aggregate amount of the three items not deducted from the first level above and in excess of 15% of CET1 capital after regulatory adjustments will be deducted from capital, and the remaining balance not deducted will be risk-weighted at 250%.

(2) Non-significant investments are subject to certain Capital Adequacy Requirements (CAR) criteria that drive the amount eligible for deduction.

The following tables provide details on our regulatory capital, RWA and capital and leverage ratios. Our capital position remains strong and our capital and leverage ratios remain well above OSFI regulatory targets:

Regulatory capital, risk-weighted assets (RWA) and capital and leverage ratios

Table 71

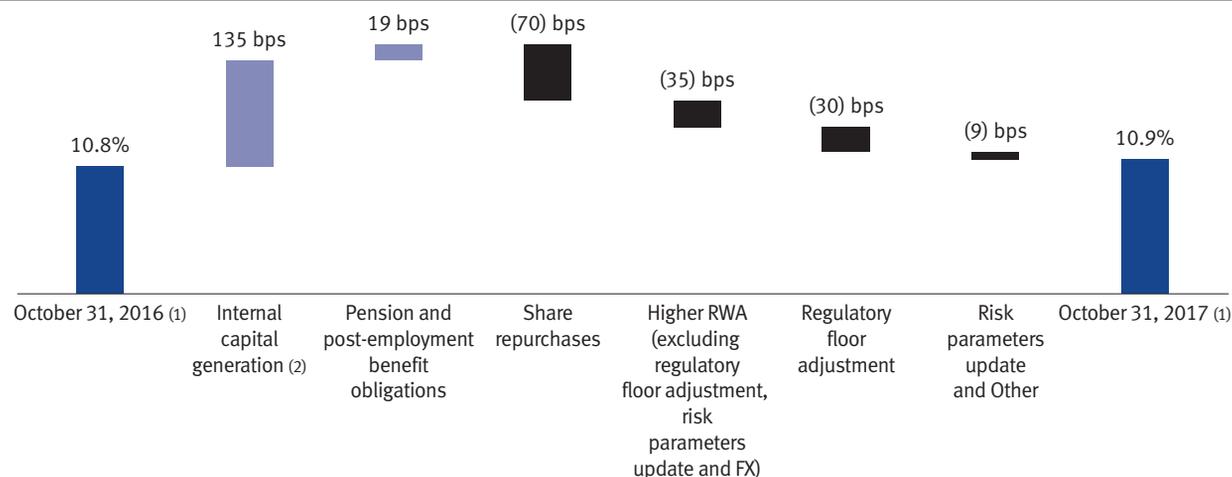
	As at	
	October 31 2017	October 31 2016
(Millions of Canadian dollars, except percentage amounts and as otherwise noted)		
Capital (1)		
CET1 capital	\$ 51,572	\$ 48,181
Tier 1 capital	58,361	55,270
Total capital	67,556	64,950
Risk-weighted Assets (RWA) used in calculation of capital ratios (1), (2)		
CET1 capital RWA	\$ 474,478	\$ 447,436
Tier 1 capital RWA	474,478	448,662
Total capital RWA	474,478	449,712
Total capital RWA consisting of: (1)		
Credit risk	\$ 376,519	\$ 369,751
Market risk	27,618	23,964
Operational risk	59,203	55,997
Regulatory floor adjustment (3)	11,138	–
Total capital RWA	\$ 474,478	\$ 449,712
Capital ratios and Leverage ratio (1), (4)		
CET1 ratio	10.9%	10.8%
Tier 1 capital ratio	12.3%	12.3%
Total capital ratio	14.2%	14.4%
Leverage ratio	4.4%	4.4%
Leverage ratio exposure (billions)	\$ 1,315.5	\$ 1,265.1

- (1) Capital, RWA, and capital ratios are calculated using OSFI Capital Adequacy Requirements based on the Basel III framework (“all-in” basis). The leverage ratio is calculated using OSFI Leverage Requirements Guideline based on the Basel III framework.
- (2) In 2016, the CVA scalars of 64%, 71% and 77% were applied to CET1, Tier 1 and Total capital, respectively. In fiscal 2017, the scalars were 72%, 77% and 81%, respectively. In 2018, the scalars will be 80%, 83% and 86%, respectively.
- (3) Before any capital floor requirement as applicable, there are three different levels of RWAs for the calculation of the CET1, Tier 1, and Total capital ratios arising from the option we have chosen for the phase-in of the CVA capital charge. Since the introduction of Basel II in 2008, OSFI has prescribed a capital floor requirement for institutions that use the advanced internal ratings-based (AIRB) approach for credit risk. The capital floor is determined by comparing a capital requirement under Basel I and Basel III, as specified by OSFI. If the capital requirement under the Basel III standards is less than 90% of the capital requirements as calculated under the Basel I standards, the difference is added to the RWAs.
- (4) To enhance comparability among other global financial institutions, our transitional CET1, Tier 1, Total capital and leverage ratios as at October 31, 2017 were 11.3%, 12.3%, 14.1%, and 4.5%, respectively. Transitional is defined as capital calculated according to the current year’s phase-in of regulatory adjustments and phase-out of non-qualifying capital instruments.

(Millions of Canadian dollars)	All-in basis	
	2017	2016
CET1 capital: instruments and reserves and regulatory adjustments		
Directly issued qualifying common share capital (and equivalent for non-joint stock companies) plus related stock surplus	\$ 18,019	\$ 18,161
Retained earnings	45,043	41,217
Accumulated other comprehensive income (and other reserves)	4,354	4,926
Directly issued capital subject to phase out from CET1 (only applicable to non-joint stock companies)	–	–
Common share capital issued by subsidiaries and held by third parties (amount allowed in group CET1)	13	13
Regulatory adjustments applied to CET1 under Basel III	(15,857)	(16,136)
Common Equity Tier 1 capital (CET1)	\$ 51,572	\$ 48,181
Additional Tier 1 capital: instruments and regulatory adjustments		
Directly issued qualifying Additional Tier 1 instruments plus related stock surplus	\$ 3,825	\$ 3,825
Directly issued capital instruments to phase out from Additional Tier 1	2,961	3,261
Additional Tier 1 instruments issued by subsidiaries and held by third parties (amount allowed in group AT1)	3	3
Regulatory adjustments applied to Additional Tier 1 under Basel III	–	–
Additional Tier 1 capital (AT1)	\$ 6,789	\$ 7,089
Tier 1 capital (T1 = CET1 + AT1)	\$ 58,361	\$ 55,270
Tier 2 capital: instruments and provisions and regulatory adjustments		
Directly issued qualifying Tier 2 instruments plus related stock surplus	\$ 6,346	\$ 6,630
Directly issued capital instruments subject to phase out from Tier 2	2,550	2,738
Tier 2 instruments issued by subsidiaries and held by third parties (amount allowed in group Tier 2)	12	18
Collective allowance	287	294
Regulatory adjustments applied to Tier 2 under Basel III	–	–
Tier 2 capital (T2)	\$ 9,195	\$ 9,680
Total capital (T1 + T2)	\$ 67,556	\$ 64,950

2017 vs. 2016

Continuity of CET1 ratio (Basel III)



(1) Represents rounded figures.

(2) Internal capital generation of \$6.0 billion which represents Net income available to shareholders, less common and preferred shares dividends.

Our CET1 ratio was 10.9%, up 10 bps from last year. Changes reflect internal capital generation and returns on our pension assets, partially offset by share repurchases, higher RWA due to business growth and a regulatory floor adjustment, and an update to our corporate and business lending risk parameters.

Our Tier 1 capital ratio of 12.3% was flat, mainly due to the factors noted above under the CET1 ratio, along with the redemption of preferred shares.

Our Total capital ratio of 14.2% was down 20 bps, mainly due to the factors noted above under the Tier 1 capital ratio.

Our Leverage ratio of 4.4% was flat, mainly due to internal capital generation and returns on our pension assets, fully offset by share repurchases and growth in leverage exposures, primarily in loans, repos-style transactions, and cash and deposits.

Basel III RWA

OSFI requires banks to meet minimum risk-based capital requirements for exposures to credit risk, operational risk, and, where they have significant trading activity, market risk. RWA is calculated for each of these risk types and added together to determine total RWA. In addition, OSFI requires the minimum risk-based capital to be no less than 90% of the capital requirements as calculated under the Basel I standards. If the capital requirement is less than 90%, a floor adjustment to RWA must be applied as prescribed by OSFI CAR guidelines.

Total capital risk-weighted assets

Table 73

As at October 31 (Millions of Canadian dollars, except percentage amounts)	2017						2016
	Exposure (1)	Average of risk weights (2)	Risk-weighted assets				Total
			Standardized approach	Advanced approach	Other	Total	
Credit risk							
Lending-related and other							
Residential mortgages	\$ 243,462	7%	\$ 5,823	\$ 12,374	\$ –	\$ 18,197	\$ 17,364
Other retail	239,041	22%	7,638	46,111	–	53,749	52,164
Business	313,550	60%	41,187	145,976	–	187,163	186,285
Sovereign	135,450	9%	2,930	8,805	–	11,735	9,776
Bank	135,527	8%	2,802	8,465	–	11,267	11,801
Total lending-related and other	\$ 1,067,030	26%	\$ 60,380	\$ 221,731	\$ –	\$ 282,111	\$ 277,390
Trading-related							
Repo-style transactions	\$ 475,832	2%	\$ 66	\$ 8,379	\$ 75	\$ 8,520	\$ 7,924
Derivatives – including CVA – CET1 phase-in adjustment	86,999	33%	603	15,977	11,808	28,388	29,796
Total trading-related	\$ 562,831	7%	\$ 669	\$ 24,356	\$ 11,883	\$ 36,908	\$ 37,720
Total lending-related and other and trading-related	\$ 1,629,861	20%	\$ 61,049	\$ 246,087	\$ 11,883	\$ 319,019	\$ 315,110
Bank book equities	3,096	113%	–	3,485	–	3,485	2,362
Securitization exposures	58,418	14%	2,386	6,076	–	8,462	9,591
Regulatory scaling factor	n.a.	n.a.	n.a.	15,306	–	15,306	15,028
Other assets	51,139	56%	n.a.	n.a.	28,836	28,836	25,384
Total credit risk	\$ 1,742,514	22%	\$ 63,435	\$ 270,954	\$ 40,719	\$ 375,108	\$ 367,475
Market risk							
Interest rate			\$ 2,562	\$ 4,348	\$ –	\$ 6,910	\$ 4,484
Equity			1,461	1,371	–	2,832	3,005
Foreign exchange			671	64	–	735	931
Commodities			232	13	–	245	326
Specific risk			5,117	2,076	–	7,193	5,730
Incremental risk charge			–	9,703	–	9,703	9,488
Total market risk			\$ 10,043	\$ 17,575	\$ –	\$ 27,618	\$ 23,964
Operational risk			\$ 4,470	\$ 54,733	n.a.	\$ 59,203	\$ 55,997
Regulatory floor adjustment (3)					12,549	12,549	–
CET1 capital risk-weighted assets (4)	\$ 1,742,514		\$ 77,948	\$ 343,262	\$ 53,268	\$ 474,478	\$ 447,436
Additional CVA adjustment, prescribed by OSFI, for Tier 1 capital					784	784	1,226
Regulatory floor adjustment (3)					(784)	(784)	–
Tier 1 capital risk-weighted assets (4)	\$ 1,742,514		\$ 77,948	\$ 343,262	\$ 53,268	\$ 474,478	\$ 448,662
Additional CVA adjustment, prescribed by OSFI, for Total capital					627	627	1,050
Regulatory floor adjustment (3)					(627)	(627)	–
Total capital risk-weighted assets (4)	\$ 1,742,514		\$ 77,948	\$ 343,262	\$ 53,268	\$ 474,478	\$ 449,712

(1) Total exposure represents exposure at default which is the expected gross exposure upon the default of an obligor. This amount is before any allowance against impaired loans or partial write-offs and does not reflect the impact of credit risk mitigation and collateral held.

(2) Represents the average of counterparty risk weights within a particular category.

(3) Before any capital floor requirement as applicable, there are three different levels of RWAs for the calculation of the CET1, Tier 1, and Total capital ratios arising from the option we have chosen for the phase-in of the CVA capital charge. Since the introduction of Basel II in 2008, OSFI has prescribed a capital floor requirement for institutions that use the advanced internal ratings-based (AIRB) approach for credit risk. The capital floor is determined by comparing a capital requirement under Basel I and Basel III, as specified by OSFI. If the capital requirement under the Basel III standards is less than 90% of the capital requirements as calculated under the Basel I standards, the difference is added to the RWAs.

(4) In 2017, the CVA scalars of 72%, 77% and 81% were applied to CET1, Tier 1 and Total capital, respectively. In 2016, the CVA scalars were 64%, 71% and 77%, respectively.

n.a. not applicable.

2017 vs. 2016

During the year, CET1 RWA was up \$27 billion, primarily reflecting business growth, mainly in loans, securities lending and securitizations, and trading portfolios, the regulatory floor adjustment, and an update to our corporate and business lending risk parameters, partially offset by the impact of foreign exchange translation.

Selected capital management activity

The following table provides our selected capital management activity:

Selected capital management activity		Table 74	
		2017	
(Millions of Canadian dollars, except number of shares)		Issuance or redemption date	Number of shares (000s) Amount
Tier 1 capital			
Common shares activity			
Issued in connection with share-based compensation plans (1)			3,477 \$ 227
Purchased for cancellation (2)			(35,973) (436)
Redemption of preferred shares, Series AB	September 27, 2017		(12,000) (300)
Tier 2 capital			
Redemption of June 26, 2037 subordinated debentures	June 26, 2017		119

(1) Amounts include cash received for stock options exercised during the period and includes fair value adjustments to stock options.

(2) During the year ended October 31, 2017, we purchased common shares for cancellation at an average cost of \$86.47 per share with a book value of \$12.15 per share.

On March 9, 2017, we announced a normal course issuer bid (NCIB) to purchase up to 30 million of our common shares, commencing on March 14, 2017 and continuing until March 10, 2018, or such earlier date as we complete the repurchase of all shares permitted under the bid. We determine the amount and timing of the purchases under the NCIB, subject to prior consultation with OSFI. Purchases may be made through the TSX, the NYSE and other designated exchanges and alternative Canadian trading systems. The price paid for such repurchased shares has been and will be the prevailing market price at the time of acquisition. Purchases may also be made through other means permitted by the TSX and applicable securities laws, including under specific share repurchase programs pursuant to issuer bid exemption orders issued by applicable securities regulatory authorities. Any purchases made under an exemption order will generally be at a discount to the prevailing market price. In 2016, we announced a normal course issuer bid for the purchase of 20 million shares, which commenced on June 1, 2016 and was completed on March 7, 2017. In 2017, the total number of common shares repurchased under our NCIB programs was approximately 36 million. The total cost of the shares repurchased was \$3,110 million, comprised of a book value of \$436 million and an additional premium paid on repurchase of \$2,674 million.

On June 26, 2017, we redeemed all ¥10,000 million outstanding 2.86% subordinated debentures due June 26, 2037 for 100% of their principal amount plus accrued interest to the redemption date. The redemption was completed on June 26, 2017.

On September 27, 2017, we redeemed all 12 million issued and outstanding Non-cumulative First Preferred Shares, Series AB, for cash at a redemption price of \$25 per share.

On November 13, 2017, we redeemed all 82,050 issued and outstanding Non-cumulative Perpetual First Preferred Shares, Series C-1, for cash at a redemption price of US\$1,000 per share.

Dividends

Our common share dividend policy reflects our earnings outlook, payout ratio objective and the need to maintain adequate levels of capital to support business plans. In 2017, our dividend payout ratio was 46%, which met our dividend payout ratio target of 40% to 50%. Common share dividends paid during the year were \$5.1 billion.

As at October 31 (Millions of Canadian dollars, except number of shares and as otherwise noted)	2017			2016		
	Number of shares (000s)	Amount	Dividends declared per share	Number of shares (000s)	Amount	Dividends declared per share
Common shares outstanding (1)	1,452,898	\$ 17,730	\$ 3.48	1,485,394	\$ 17,939	\$ 3.24
First preferred shares outstanding						
Non-cumulative Series W (2)	12,000	300	1.23	12,000	300	1.23
Non-cumulative Series AA	12,000	300	1.11	12,000	300	1.11
Non-cumulative Series AB (3)	–	–	0.99	12,000	300	1.18
Non-cumulative Series AC	8,000	200	1.15	8,000	200	1.15
Non-cumulative Series AD	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AE	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AF	8,000	200	1.11	8,000	200	1.11
Non-cumulative Series AG	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AJ (4)	13,579	339	0.88	13,579	339	0.88
Non-cumulative Series AK (4)	2,421	61	0.62	2,421	61	0.60
Non-cumulative Series AL (4)	12,000	300	1.07	12,000	300	1.07
Non-cumulative Series AZ (4), (5)	20,000	500	1.00	20,000	500	1.00
Non-cumulative Series BB (4), (5)	20,000	500	0.98	20,000	500	0.98
Non-cumulative Series BD (4), (5)	24,000	600	0.90	24,000	600	0.90
Non-cumulative Series BF (4), (5)	12,000	300	0.90	12,000	300	0.90
Non-cumulative Series BH (5)	6,000	150	1.23	6,000	150	1.23
Non-cumulative Series BI (5)	6,000	150	1.23	6,000	150	1.23
Non-cumulative Series BJ (5)	6,000	150	1.31	6,000	150	1.51
Non-cumulative Series BK (4), (5)	29,000	725	1.38	29,000	725	1.29
Non-cumulative Series BM (4), (5)	30,000	750	1.38	30,000	750	0.98
Non-cumulative Series C-1 (6)	82	107	US\$ 55.00	82	107	US\$55.00
Non-cumulative Series C-2 (6)	20	31	US\$ 67.50	20	31	US\$67.50
Treasury shares held – preferred	6	–		31	–	
Treasury shares held – common	(363)	(27)		(1,159)	(80)	
Stock options						
Outstanding	9,315			11,388		
Exercisable	4,337			6,909		
Available for grant (7)	9,933			9,267		
Dividends						
Common		5,096			4,817	
Preferred		300			294	

(1) For further details about our capital management activity, refer to Note 21 of our 2017 Annual Consolidated Financial Statements.

(2) Effective February 24, 2010, we have the right to convert these shares into common shares at our option, subject to certain restrictions.

(3) On September 27, 2017, we redeemed all 12 million issued and outstanding Non-cumulative First Preferred Shares, Series AB, for cash at a redemption price of \$25 per share.

(4) Dividend rate will reset every five years.

(5) Non-viable contingent capital (NVCC) instruments.

(6) Represents 3,282,000 and 815,400 depositary shares relating to preferred shares Series C-1 and Series C-2, respectively. Each depositary share represents one-fortieth interest in a share of Series C-1 and Series C-2, respectively.

(7) 2016 amount excludes 2.1 million stock options available for grant, which became available upon the exercise of tandem stock appreciation rights prior to November 1, 2015.

As at November 24, 2017, the number of outstanding common shares and stock options and awards was 1,453,039,318 and 9,124,811, respectively, and the number of Treasury shares – preferred and Treasury shares – common was (99,367) and (202,634), respectively.

NVCC provisions require the conversion of the capital instrument into a variable number of common shares in the event that OSFI deems a bank to be non-viable or a federal or provincial government in Canada publicly announces that a bank has accepted or agreed to accept a capital injection. If a NVCC trigger event were to occur, our NVCC capital instruments, which are the preferred shares Series AZ, preferred shares Series BB, preferred shares Series BD, preferred shares Series BF, preferred shares Series BH, preferred shares Series BI, preferred shares Series BJ, preferred shares Series BK, preferred shares Series BM, subordinated debentures due on July 17, 2024, subordinated debentures due on September 29, 2026, subordinated debentures due on June 4, 2025, subordinated debentures due on January 20, 2026 and subordinated debentures due on January 27, 2026, would be converted into RBC common shares pursuant to an automatic conversion formula with a conversion price based on the greater of: (i) a contractual floor price of \$5.00, and (ii) the current market price of our common shares at the time of the trigger event (10-day weighted average). Based on a floor price of \$5.00 and including an estimate for accrued dividends and interest, these NVCC capital instruments would convert into a maximum of 2,739 million RBC common shares, in aggregate, which would represent a dilution impact of 65.34% based on the number of RBC common shares outstanding as at October 31, 2017.

Attributed capital

Our methodology for allocating capital to our business segments is based on the higher of fully diversified economic capital and the Basel III regulatory capital requirements. Risk-based capital attribution provides a uniform base for performance measurement among business segments, which compares to our overall corporate return objective and facilitates management decisions in resource allocation in conjunction with other factors.

Attributed capital is calculated and attributed on a wider array of risks compared to Basel III regulatory capital requirements, which are calibrated predominantly to target credit, market (trading) and operational risk measures. Economic capital is our internal quantification of risks associated with business activities which is the capital required to remain solvent under extreme market conditions, reflecting our objective to maintain strong credit ratings. Economic capital is calculated based on credit, market (trading and non-trading), operational, business and fixed asset, and insurance risks, along with capital attribution for goodwill and other intangibles. The common risks between the two frameworks are aligned to reflect increased regulatory requirements.

- Business risk is the risk of loss or harm due to variances in volumes, prices and costs caused by competitive forces, regulatory changes, reputation and strategic risks.
- Fixed asset risk is defined as the risk that the value of fixed assets will be less than their book value at a future date.

For further discussion on Credit, Market, Operational and Insurance risks, refer to the Risk management section.

Attributed capital is also used to assess the adequacy of our capital base. Our policy is to maintain a level of available capital, defined as common equity and other capital instruments with equity-like loss absorption features such as preferred shares that exceed Economic capital with a comfortable cushion.

The calculation and attribution of capital involves a number of assumptions and judgments by management which are monitored to ensure that the economic capital framework remains comprehensive and consistent. The models are benchmarked to leading industry practices via participation in surveys, reviews of methodologies and ongoing interaction with external risk management industry professionals.

The following outlines our attributed capital:

Attributed capital		Table 76	
(Millions of Canadian dollars)	2017	2016	
Credit risk	\$ 21,450	\$ 20,550	
Market risk (trading and non-trading)	3,250	3,200	
Operational risk	5,200	4,900	
Business and fixed asset risk	3,200	3,100	
Insurance risk	650	650	
Goodwill and other intangibles	15,550	16,100	
Regulatory capital allocation	10,950	8,900	
Attributed capital	\$ 60,250	\$ 57,400	
Unattributed capital	5,050	4,800	
Average common equity	\$ 65,300	\$ 62,200	

2017 vs. 2016

Attributed capital increased \$3 billion, mainly reflecting business growth, higher capital attribution rate, and the update to our corporate and business lending risk parameters.

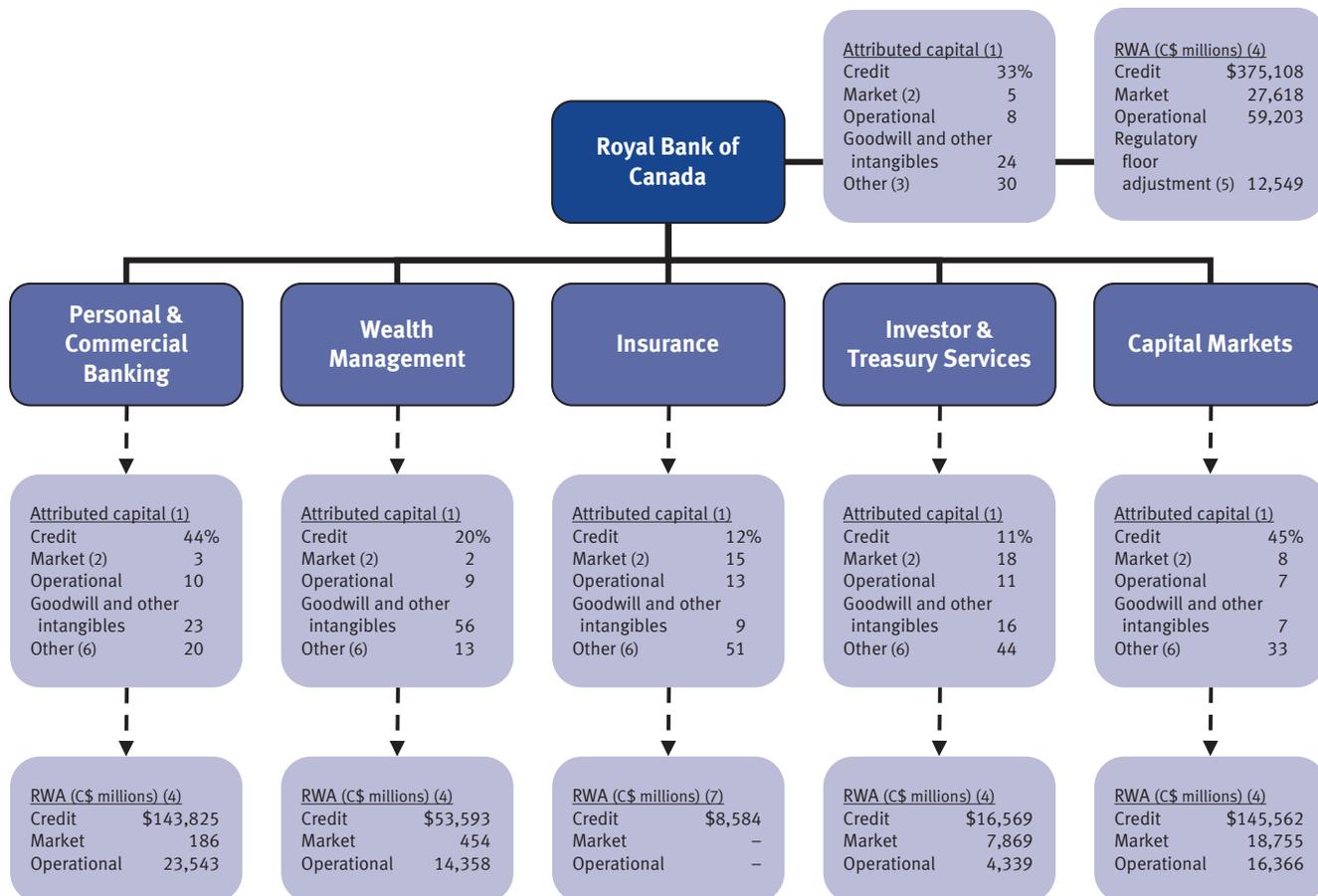
We remain well capitalized with current levels of available capital exceeding the attributed capital required to underpin all of our material risks.

Attributed capital in the context of our business activities

In carrying out our business activities, we are exposed to a range of risks. The following chart provides a high level view of risks within our business segments, which includes credit, market and operational risks. We have used attributed capital to illustrate the relative size of the risks in each of our businesses. The attributed capital distribution reflects the diversified nature of our business activities. RWA represents our exposure to credit, market and operational risk for regulatory capital requirements.

Within Personal & Commercial Banking, credit risk is the most significant risk, largely related to our personal financial services, business financial services and cards businesses. The primary risks within Wealth Management, which provides services to institutional and individual clients, are operational risk and credit risk. Risks within our Insurance operations are primarily related to insurance risk in our life and health businesses followed by market risk and operational risk. The largest risk within Investor & Treasury Services is market risk, followed by credit risk and operational risk. The most significant risk within Capital Markets is credit risk, followed by market risk.

For additional information on the risks highlighted below, refer to the Risk management section.



- (1) Attributed capital: An estimate of the amount of equity capital required to underpin risks. It is calculated by estimating the level of capital that is necessary to support our various businesses, given their risks, consistent with our desired solvency standard and credit ratings.
- (2) Market risk attributed capital: An estimate of the amount of equity capital required to underpin trading market risk and interest rate risk.
- (3) Other – RBC: Includes (a) an estimate of the amount of equity capital required to underpin risks associated with business, fixed assets and insurance risks; (b) a regulatory capital adjustment since attributed capital is determined at the higher of regulatory or economic capital; and (c) unattributed capital reported representing common equity in excess of common equity attributed to our business segments which is reported in the Corporate Support segment only.
- (4) RWA amount represents RWA for CET1.
- (5) RWA regulatory floor adjustment is not attributed to business segments.
- (6) Other – Business segments: Includes (a) an estimate of the amount of equity capital required to underpin risks associated with business, fixed assets and insurance risks; and (b) a regulatory capital adjustment since attributed capital is determined at the business segment level as the greater of regulatory or economic capital.
- (7) Insurance RWA amount above represents our investments in the insurance subsidiaries capitalized at the regulatory prescribed rate as required under Basel CAR filing.

Subsidiary capital

Our capital management framework includes the management of subsidiaries' capital. We invest capital across the enterprise to meet local regulators' capital adequacy requirements and maximize returns to our shareholders. We set guidelines for defining capital investments in our subsidiaries and manage the relationship between capital invested in subsidiaries and our consolidated capital base to ensure that we can access capital recognized in our consolidated regulatory capital measurements.

Each of our subsidiaries has responsibility for maintaining compliance with local regulatory capital adequacy requirements, which may include restrictions on the transfer of assets in the form of cash, dividends, loans or advances. Concurrently, Corporate Treasury provides centralized oversight of capital adequacy across all subsidiary entities.

Other considerations affecting capital

Capital treatment for equity investments in other entities is determined by a combination of accounting and regulatory guidelines based on the size or nature of the investment. Three broad approaches apply as follows:

- Consolidation: entities which we control are consolidated on our Consolidated Balance Sheets.
- Deduction: certain holdings are deducted from our regulatory capital. These include all unconsolidated "substantial investments," as defined by *the Bank Act* (Canada) in the capital of financial institutions, as well as all investments in insurance subsidiaries.
- Risk weighting: equity investments that are not deducted from capital are risk weighted at a prescribed rate for determination of capital charges.

Regulatory capital approach for securitization exposures

For our securitization exposures, we use an internal assessment approach (IAA) for exposures related to our ABCP business, and for other securitization exposures we use a combination of approaches including a ratings-based approach and the standardized approach.

While our IAA rating methodologies are based in large part on criteria that are published by External Credit Assessment Institutions (ECAIs) such as S&P and therefore are similar to the methodologies used by these institutions, they are not identical. Our ratings process includes a comparison of the available credit enhancement in a securitization structure to a stressed level of projected losses. The stress level used is determined by the desired risk profile of the transaction. As a result, we stress the cash flows of a given transaction at a higher level in order to achieve a higher rating. Conversely, transactions that only pass lower stress levels achieve lower ratings.

Most of the other securitization exposures (non-ABCP) carry external ratings and we use the lower of our own rating or the lowest external rating for determining the proper capital allocation for these positions. We periodically compare our own ratings to ECAIs ratings to ensure that the ratings provided by ECAIs are reasonable.

GRM is responsible for providing risk assessments for capital purposes in respect of all our banking book exposures. GRM is independent of the business originating the securitization exposures and performs its own analysis, sometimes in conjunction with but always independent of the applicable business. GRM has developed asset specific criteria guidelines which provide the rating methodologies for each asset class. The guidelines are reviewed periodically and are subject to the ratings replication process mandated by Pillar I of the Basel rules.

Accounting and control matters

Critical accounting policies and estimates

Application of critical accounting policies, judgments, estimates and assumptions

Our significant accounting policies are described in Note 2 to our 2017 Annual Consolidated Financial Statements. Certain of these policies and related estimates are recognized as critical because they require us to make particularly subjective or complex judgments about matters that are inherently uncertain and significantly different amounts could be reported under different conditions or using different assumptions. Our critical accounting judgments, estimates and assumptions relate to the fair value of financial instrument and securities impairment, allowance for credit losses, goodwill and other intangible assets, employee benefits, consolidation, derecognition of financial assets, application of the effective interest method, provisions, insurance claims and policy benefit liabilities, income taxes, and deferred revenue on our customer loyalty program. Our critical accounting policies and estimates have been reviewed and approved by our Audit Committee, in consultation with management, as part of their review and approval of our significant accounting policies, judgments, estimates and assumptions.

Fair value of financial instruments and securities impairment

The fair value of a financial instrument is 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. We determine fair value by incorporating factors that market participants would consider in setting a price, including commonly accepted valuation approaches.

We give priority to third-party pricing services and valuation techniques with the highest and most consistent accuracy. The level of accuracy is determined over time by comparing third-party price values to traders' or system values, other pricing service values and, when available, actual trade data. Other valuation techniques are used when a price or quote is not available. Some valuation processes use models to determine fair value. We have a systematic and consistent approach to control model use.

In determining fair value, a hierarchy is used which prioritizes the inputs to valuation techniques. The fair value hierarchy gives the highest priority to unadjusted quoted prices in active markets and the lowest priority to unobservable inputs. Fair values established based on this hierarchy require the use of observable market data whenever available. Level 1 inputs are unadjusted quoted prices in active markets for identical assets or liabilities that we have the ability to access at the measurement date. Level 2 inputs include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, and model inputs that are either observable, or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 3 inputs are one or more inputs that are unobservable and significant to the fair value of the asset or liability. Unobservable inputs are used to measure fair value to the extent that observable inputs are not available at the measurement date. The availability of inputs for valuation may affect the selection of valuation techniques. The classification of a financial instrument in the fair value hierarchy for disclosure purposes is based upon the lowest level of input that is significant to the measurement of fair value.

Where observable prices or inputs are not available, management judgment is required to determine fair values by assessing other relevant sources of information such as historical data, proxy information from similar transactions, and through extrapolation and interpolation techniques. For more complex or illiquid instruments, significant judgment is required to determine the model used, select the model inputs, and in some cases, apply valuation adjustments to the model value or quoted price for inactively traded financial instruments. The selection of model inputs may be subjective and the inputs may be unobservable. Unobservable inputs are inherently uncertain as there is little or no market data available from which to determine the level at which the transaction would occur under normal business circumstances. Appropriate parameter uncertainty and market risk valuation adjustments for such inputs and other model risk valuation adjustments are assessed in all such instances.

Valuation adjustments may be subjective as they require significant judgment in the input selection, such as the probability of default and recovery rate, and are intended to arrive at a fair value that is determined based on assumptions that market participants would use in pricing the financial instrument. The realized price for a transaction may be different from its recorded value that was previously estimated using management judgment, and may therefore impact unrealized gains and losses recognized in Non-interest income – Trading revenue or Other.

At each reporting date or more frequently when conditions warrant, we evaluate our AFS securities to determine whether there is any objective evidence of impairment, such as a significant or prolonged decline in the fair value of the security below its cost or when an adverse effect on future cash flows from the security can be reliably estimated. Evidence of impairment includes, but is not limited to, delinquency or default, bankruptcy, restructuring or other events that may question the issuer's creditworthiness. When assessing impairment for debt instruments we primarily consider counterparty ratings and security-specific factors, including collateral, external ratings, subordination and other market factors. For complex debt instruments including U.S. non-agency MBS, ABS and other structured products, we also use cash flow projection models which incorporate actual and projected cash flows for each security using a number of assumptions and inputs that are based on security specific factors. The inputs and assumptions used, such as default, prepayment and recovery rates, are based on updated market data. In addition, we consider the transaction structure and credit enhancement for structured securities. If results indicate that we will not be able to recover the entire principal and interest amount, we do a further review of the security in order to assess whether a loss would ultimately be realized. As equity securities do not have contractual cash flows, they are assessed differently than debt securities. When assessing equity securities for impairment, we consider factors that include the length of time and extent the fair value has been below cost and the financial condition and near term prospects of the issuer. We also consider the estimated recoverable value and the period of recovery. Refer to Note 4 to our 2017 Annual Consolidated Financial Statements for more information.

Allowance for credit losses

We maintain an allowance for credit losses relating to on-balance sheet exposures, such as loans and acceptances, and off-balance sheet items such as letters of credit, guarantees and unfunded commitments, at levels that we consider appropriate to cover credit-related losses incurred as at the balance sheet date.

Loans which are individually significant are assessed individually for objective indicators of impairment. A loan is considered impaired when we determine that we will not be able to collect all amounts due according to the original contractual terms. Credit exposures of individually significant loans are evaluated based on factors including the borrower's overall financial condition, resources and payment record, and where applicable, the realizable value of any collateral. If there is evidence of impairment leading to an impairment loss, then the amount of the loss is determined as the difference between the carrying value of the loan, including accrued interest, and the estimated recoverable amount. The estimated recoverable amount is measured as the present value of expected future cash flows discounted at the loan's original effective interest rate, including cash flows that may result from the realization of collateral less costs to sell.

Loans which are not individually significant, or which are individually assessed and not determined to be impaired, are collectively assessed for impairment. For the purposes of a collective evaluation of impairment, loans are grouped on the basis of similar credit risk characteristics, taking into account loan type, industry, geographic location, collateral type, past due status and other relevant factors. The collective impairment allowance is determined by reviewing factors including: (i) historical loss experience, which takes into consideration historical probabilities of default, loss given default and exposure at default, and (ii) management's judgment on the level of impairment losses based on historical experience relative to the actual level as reported at the balance sheet date, taking into consideration the current portfolio credit quality trends; business, economic and credit conditions; the impact of policy and process changes; and other supporting factors. Future cash flows for a group of loans are collectively evaluated for impairment on the basis of contractual cash flows and historical loss experience for loans with credit risk characteristics similar to those in the group. We use historical loss experience and normalize observable inputs for current and past conditions that are not relevant to the assessment performed for the current reporting period. The methodology and assumptions used for estimating future cash flows are reviewed regularly to reduce any differences between loss estimates and actual loss experience.

Loans and the related impairment allowance for credit losses are written off, either partially or in full, when there is no realistic prospect of recovery. Where loans are secured, they are generally written off after receipt of any proceeds from the realization of the collateral. In circumstances where the net realizable value of any collateral has been determined and there is no reasonable expectation of further recovery, write off may be earlier.

For further information on allowance for credit losses, refer to Note 5 to our 2017 Annual Consolidated Financial Statements.

Goodwill and other intangible assets

We allocate goodwill to groups of cash-generating units (CGU). Goodwill is not amortized and is tested for impairment on an annual basis, or more frequently if there are objective indications of impairment. We test for impairment by comparing the recoverable amount of a CGU with its carrying amount.

We estimate the value in use and fair value less costs of disposal of our CGUs primarily using a discounted cash flow method which incorporates each CGU's internal forecasts of revenues and expenses. Significant management judgment is applied in the determination of expected future cash flows (uncertainty in timing and amount), discount rates (based on CGU-specific risks) and terminal growth rates. CGU-specific risks include country risk, business/operational risk, geographic risk (including political risk, devaluation risk and government regulation), currency risk and price risk (including product pricing risk and inflation). If the forecast earnings and other assumptions in future periods deviate significantly from the current amounts used in our impairment testing, the value of our goodwill could become impaired.

We assess for indicators of impairment of our other intangible assets at each reporting period. If there is an indication that an asset may be impaired, an impairment test is performed by comparing the carrying amount of the intangible asset to its recoverable amount. Where it is not possible to estimate the recoverable amount of an individual asset, we estimate the recoverable amount of the CGU to which the asset belongs. Significant judgment is applied in estimating the useful lives and recoverable amounts of our intangible assets and assessing whether certain events or circumstances constitute objective evidence of impairment. We do not have any other intangible assets with indefinite lives.

For further details, refer to Notes 2 and 10 to our 2017 Annual Consolidated Financial Statements.

Employee benefits

We sponsor a number of benefit programs for eligible employees, including registered pension plans, supplemental pension plans, health, dental, disability and life insurance plans.

The calculation of defined benefit expenses and obligations depends on various assumptions such as discount rates, healthcare cost trend rates, projected salary increases, retirement age, and mortality and termination rates. Discount rates are determined using a yield curve based on spot rates from high quality corporate bonds. All other assumptions are determined by us and are reviewed by the actuaries. Actual experience that differs from the actuarial assumptions will affect the amounts of benefit obligations and remeasurements that we recognize. The weighted average assumptions used and the sensitivity of key assumptions are presented in Note 17 to our 2017 Annual Consolidated Financial Statements.

Consolidation of structured entities

Subsidiaries are those entities, including structured entities, over which we have control. We control an entity when we are exposed, or have rights, to variable returns from our involvement with the entity and have the ability to affect those returns through our power over the investee. We have power over an entity when we have existing rights that give us the current ability to direct the activities that most significantly affect the entity's returns (relevant activities). Power may be determined on the basis of voting rights or, in the case of structured entities, other contractual arrangements.

We are not deemed to control an entity when we exercise power over an entity as the agent of a third party or parties. In determining whether we are acting as an agent, we consider the overall relationship between us, the investee and other parties to the arrangement with respect to the following factors: (i) the scope of our decision making power; (ii) the rights held by other parties; (iii) the remuneration to which we are entitled; and (iv) our exposure to variability of returns.

The determination of control is based on the current facts and circumstances and is continuously assessed. In some circumstances, different factors and conditions may indicate that various parties control an entity depending on whether those factors and conditions are assessed in isolation or in totality. Significant judgment is applied in determining whether we control an entity, specifically, assessing whether we have substantive decision making rights over the relevant activities and whether we are exercising our power as a principal or an agent.

We consolidate all subsidiaries from the date control is transferred to us, and cease consolidation when an entity is no longer controlled by us. Our consolidation conclusions affect the classification and amount of assets, liabilities, revenues and expenses reported in our Consolidated Financial Statements.

For further details, refer to the Note 7 to our 2017 Annual Consolidated Financial Statements.

Derecognition of financial assets

We periodically enter into transactions in which we transfer financial assets such as loans or mortgage-backed securities to structured entities or trusts that issue securities to investors. We derecognize the assets when our contractual rights to the cash flows from the assets have expired; when we retain the rights to receive the cash flows but assume an obligation to pay those cash flows to a third party subject to certain pass-through requirements; or when we transfer our contractual rights to receive the cash flows and substantially all of the risks and rewards of the assets have been transferred. When we retain substantially all of the risks and rewards of the transferred assets, the transferred assets are not derecognized from our Consolidated Balance Sheets and are accounted for as secured financing transactions. When we neither retain nor transfer substantially all risks and rewards of ownership of the assets, we derecognize the assets if control over the assets is relinquished. If we retain control over the transferred assets, we continue to recognize the transferred assets to the extent of our continuing involvement. Management's judgment is applied in determining whether we have transferred or retained substantially all risk and rewards of ownership of the transferred financial asset.

The majority of assets transferred under repurchase agreements, securities lending agreements, and in our Canadian residential mortgage securitization transactions do not qualify for derecognition. As a result, we continue to record the associated transferred assets on our Consolidated Balance Sheets and no gains or losses are recognized for those securitization activities. Otherwise, a gain or loss is recognized on securitization by comparing the carrying amount of the transferred asset with its fair value at the date of the transfer. For further information on derecognition of financial assets, refer to Note 6 to our 2017 Annual Consolidated Financial Statements.

Application of the effective interest method

Interest is recognized in Interest income and Interest expense in the Consolidated Statements of Income for all interest bearing financial instruments using the effective interest method. The effective interest rate is the rate that discounts estimated future cash flows over the expected life of the financial asset or liability to the net carrying amount upon initial recognition. Significant judgment is applied in determining the effective interest rate due to uncertainty in the timing and amounts of future cash flows.

Provisions

Provisions are liabilities of uncertain timing or amount and are recognized when we have a present legal or constructive obligation as a result of a past event, it is probable that an outflow of resources will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation. We record provisions related to litigation, asset retirement obligations, and the allowance for off-balance sheet and other items. Provisions are recorded under Other liabilities on our Consolidated Balance Sheets.

Provisions are measured as the best estimate of the consideration required to settle the present obligation at the reporting date. Significant judgment is required in determining whether a present obligation exists and in estimating the probability, timing and amount of any outflows. The forward-looking nature of these estimates requires us to use a significant amount of judgment in projecting the timing and amount of future cash flows. We record our provisions on the basis of all available information at the end of the reporting period and make adjustments on a quarterly basis to reflect current expectations. Should actual results differ from our expectations, we may incur expenses in excess of the provisions recognized.

When some or all of the economic benefits required to settle a provision are expected to be recovered from a third party, such as an insurer, a separate asset is recognized if it is virtually certain that reimbursement will be received.

Insurance claims and policy benefit liabilities

Insurance claims and policy benefit liabilities represent current claims and estimates for future insurance policy benefits. Liabilities for life insurance contracts are determined using the Canadian Asset Liability Method, which incorporates assumptions for mortality, morbidity, policy lapses and surrenders, investment yields, policy dividends, operating and policy maintenance expenses, and provisions for adverse deviation. These assumptions are reviewed at least annually and updated in response to actual experience and market conditions. Liabilities for property and casualty insurance represent estimated provisions for reported and unreported claims. Liabilities for life and property and casualty insurance are included in Insurance claims and policy benefit liabilities. Changes in Insurance claims and policy benefit liabilities are included in the Insurance policyholder benefits, claims and acquisition expense in our Consolidated Statements of Income in the period in which the estimates change. Refer to Note 15 to our 2017 Annual Consolidated Financial Statements for further information.

Income taxes

We are subject to income tax laws in various jurisdictions where we operate, and the complex tax laws are potentially subject to different interpretations by us and the relevant taxation authority. Management's judgment is applied in interpreting the relevant tax laws and estimating the expected timing and amount of the provision for current and deferred income taxes. A deferred tax asset or liability is determined for each temporary difference based on the tax rates that are expected to be in effect in the period that the asset is realized or the liability is settled. Where the temporary differences will not reverse in the foreseeable future, no deferred tax amount is recognized.

On a quarterly basis, we review whether it is probable that the benefits associated with our deferred tax assets will be realized, using both positive and negative evidence. Refer to Note 23 to our 2017 Annual Consolidated Financial Statements for further information.

Future changes in accounting policy and disclosure

IFRS 9 Financial Instruments (IFRS 9)

In July 2014, the IASB issued the complete version of IFRS 9, which brings together the classification and measurement, impairment and hedge accounting phases of the IASB's project to replace IAS 39 *Financial Instruments: Recognition and Measurement* (IAS 39).

In January 2015, OSFI issued an advisory with respect to the early adoption of IFRS 9 for D-SIBs, requiring D-SIBs to adopt IFRS 9 for the annual period beginning on November 1, 2017. As a result, we are required to adopt IFRS 9 on November 1, 2017, with the exception of the own credit provisions of IFRS 9, which we adopted in the second quarter of 2014.

In June 2016, OSFI issued its final guideline on *IFRS 9 Financial Instruments and Disclosures*. The guideline provides guidance to Federally Regulated Entities on the application of IFRS 9, including the implementation of the expected credit loss framework under IFRS 9. The OSFI guideline is effective for us on November 1, 2017, consistent with the adoption of IFRS 9.

The new classification and measurement and impairment requirements will be applied by adjusting our Consolidated Balance Sheet on November 1, 2017, the date of initial application, with no restatement of comparative period financial information. Based on current estimates, the adoption of IFRS 9 is expected to result in a reduction to retained earnings as at November 1, 2017 of approximately \$600 million, net of taxes. The impact is primarily attributable to increases in the allowance for credit losses under the new impairment requirements. We do not expect the adoption of IFRS 9 to have a significant impact on our CET1 capital. We continue to monitor and refine certain elements of our impairment process in advance of Q1 2018 reporting.

Classification and measurement

IFRS 9 introduces a principles-based approach to the classification of financial assets. Debt instruments, including hybrid contracts, are measured at fair value through profit or loss (FVTPL), FVOCI or amortized cost based on the nature of the cash flows of the assets and an entity's business model. These categories replace the existing IAS 39 classifications of FVTPL, AFS, loans and receivables, and held-to-maturity. Equity instruments are measured at FVTPL, unless they are not held for trading purposes, in which case an irrevocable election can be made on initial recognition to measure them at FVOCI with no subsequent reclassification to profit or loss.

For financial liabilities, most of the pre-existing requirements for classification and measurement previously included in IAS 39 were carried forward unchanged into IFRS 9. The requirements related to the fair value option for financial liabilities, which were adopted in 2014, were changed to address the treatment of own credit risk.

The combined application of the contractual cash flow characteristics and business model tests as at November 1, 2017 is expected to result in certain differences in the classification of financial assets when compared to our classification under IAS 39. The most significant changes include the following:

- Approximately \$25 billion of debt securities previously classified as AFS are expected to be classified as amortized cost based on a held-to-collect business model.
- Approximately \$2.5 billion of securities previously classified as AFS are expected to be classified as FVTPL, primarily representing equities and debt securities whose cash flows do not represent solely payments of principal and interest.

Impairment

IFRS 9 introduces an expected credit loss impairment model that differs significantly from the incurred loss model under IAS 39 and is expected to result in earlier recognition of credit losses. Additional details on the key elements of the new expected credit loss model are described below.

Scope

Under IFRS 9, the same impairment model is applied to all financial assets, except for financial assets classified or designated as at FVTPL and equity securities designated as at FVOCI, which are not subject to impairment assessment. The scope of the IFRS 9 expected credit loss impairment model includes amortized cost financial assets, debt securities classified as at FVOCI, and off balance sheet loan commitments and financial guarantees which were previously provided for under IAS 37 *Provisions, Contingent Liabilities and Contingent Assets* (IAS 37). The above-mentioned reclassifications into or out of these categories under IFRS 9 and items that previously fell under the IAS 37 framework were considered in determining the scope of our application of the new expected credit loss impairment model.

Expected credit loss impairment model

Under IFRS 9, credit loss allowances will be measured on each reporting date according to a three-stage expected credit loss impairment model:

- Stage 1 – From initial recognition of a financial asset to the date on which the asset has experienced a significant increase in credit risk relative to its initial recognition, a loss allowance is recognized equal to the credit losses expected to result from defaults occurring over the next 12 months.
- Stage 2 – Following a significant increase in credit risk relative to the initial recognition of the financial asset, a loss allowance is recognized equal to the credit losses expected over the remaining lifetime of the asset.
- Stage 3 – When a financial asset is considered to be credit-impaired, a loss allowance equal to full lifetime expected credit losses will be recognized. Interest revenue is calculated based on the carrying amount of the asset, net of the loss allowance, rather than on its gross carrying amount.

Stage 1 and Stage 2 credit loss allowances effectively replace the collectively-assessed allowance for loans not yet identified as impaired recorded under IAS 39, while Stage 3 credit loss allowances effectively replace the individually and collectively assessed allowances for impaired loans. Under IFRS 9, the population of financial assets and corresponding allowances disclosed as Stage 3 will not necessarily correspond to the amounts of financial assets currently disclosed as impaired in accordance with IAS 39. Consistent with IAS 39, loans are written off when there is no realistic probability of recovery. Accordingly, our policy on when financial assets are written-off will not significantly change on adoption of IFRS 9.

Because all financial assets within the scope of the IFRS 9 impairment model will be assessed for at least 12-months of expected credit losses, and the population of financial assets to which full lifetime expected credit losses applies is larger than the population of impaired loans for which there is objective evidence of impairment in accordance with IAS 39, loss allowances are generally expected to be higher under IFRS 9 relative to IAS 39.

Changes in the required credit loss allowance, including the impact of movements between Stage 1 (12 month expected credit losses) and Stage 2 (lifetime expected credit losses), will be recorded in profit or loss. Because of the impact of moving between 12 month and lifetime expected credit losses and the application of forward looking information, provisions are expected to be more volatile under IFRS 9 than IAS 39.

Measurement

The measurement of expected credit losses will primarily be based on the product of the instrument's probability of default (PD), loss given default (LGD), and exposure at default (EAD), discounted to the reporting date. The main difference between Stage 1 and Stage 2 expected credit losses is the respective PD horizon. Stage 1 estimates will use a maximum of a 12-month PD while Stage 2 estimates will use a lifetime PD. Stage 3 estimates will continue to leverage existing processes for estimating losses on impaired loans, however, these processes will be updated to reflect the requirements of IFRS 9, including the requirement to consider multiple forward-looking scenarios.

An expected credit loss estimate will be produced for each individual exposure, including amounts which are subject to a more simplified model for estimating expected credit losses; however the relevant parameters will be modeled on a collective basis using largely the same underlying data pool supporting our stress testing and regulatory capital expected loss processes. Models have been developed, primarily leveraging our existing models for enterprise-wide stress testing.

For the small percentage of our portfolios that lack detailed historical information and/or loss experience, we will apply simplified measurement approaches that may differ from what is described above. These approaches have been designed to maximize the available information that is reliable and supportable for each portfolio and may be collective in nature.

Expected credit losses must be discounted to the reporting period using the effective interest rate, or an approximation thereof.

Movement between stages

Movements between Stage 1 and Stage 2 are based on whether an instrument's credit risk as at the reporting date has increased significantly relative to the date it was initially recognized. For the purposes of this assessment, credit risk is based on an instrument's lifetime PD, not the

losses we expect to incur. The assessment of significant increases in credit risk is a new concept under IFRS 9 and will require significant judgment.

Our assessment of significant increases in credit risk will be performed at least quarterly for each individual exposure based on three factors. If any of the following factors indicates that a significant increase in credit risk has occurred, the instrument will be moved from Stage 1 to Stage 2:

- (1) We have established thresholds for significant increases in credit risk based on both a percentage and absolute change in lifetime PD relative to initial recognition. The exact thresholds applied will differ by product and/or business.
- (2) Additional qualitative reviews will be performed to assess the staging results and make adjustments, as necessary, to better reflect the positions which have significantly increased in risk.
- (3) IFRS 9 contains a rebuttable presumption that instruments which are 30 days past due have experienced a significant increase in credit risk. We do not intend to rebut this presumption.

Movements between Stage 2 and Stage 3 are based on whether financial assets are credit-impaired as at the reporting date. The determination of credit-impairment under IFRS 9 will be similar to the individual assessment of financial assets for objective evidence of impairment under IAS 39.

The assessments for significant increases in credit risk since initial recognition and credit-impairment are performed independently as at each reporting period. Assets can move in both directions through the stages of the impairment model. After a financial asset has migrated to Stage 2, if it is no longer considered that credit risk has significantly increased relative to initial recognition in a subsequent reporting period, it will move back to Stage 1. Similarly, an asset that is in Stage 3 will move back to Stage 2 if it is no longer considered to be credit-impaired.

Forward-looking information

The measurement of expected credit losses for each stage and the assessment of significant increases in credit risk must consider information about past events and current conditions as well as reasonable and supportable forecasts of future events and economic conditions. The estimation and application of forward-looking information will require significant judgment.

PD, LGD and EAD inputs used to estimate Stage 1 and Stage 2 credit loss allowances are modelled based on the macroeconomic variables (or changes in macroeconomic variables) that are most closely correlated with credit losses in the relevant portfolio. Each macroeconomic scenario used in our expected credit loss calculation will have forecasts of the relevant macroeconomic variables – including, but not limited to, unemployment rates, gross domestic product, bond yields, credit spreads, equity indices, stock market volatility, residential and commercial real estate prices, and commodity prices – for a five year period, subsequently reverting to long-run averages.

Our estimation of expected credit losses in Stage 1 and Stage 2 will be a discounted probability-weighted estimate that considers a minimum of three future macroeconomic scenarios. Our base case scenario will be based on macroeconomic forecasts published by our internal economics group. Upside and downside scenarios will be set relative to our base case scenario based on reasonably possible alternative macroeconomic conditions. Scenario design, including the identification of additional downside scenarios will occur on at least an annual basis and more frequently if conditions warrant.

Scenarios will be probability-weighted according to our best estimate of their relative likelihood based on historical frequency and current trends and conditions. Probability weights will be updated on a quarterly basis. All scenarios considered will be applied to all portfolios subject to expected credit losses with the same probabilities.

Loss rates used in collectively-assessed Stage 3 allowances will be adjusted based on the forward-looking macroeconomic scenarios used in the Stage 1 and Stage 2 estimates. Individually-assessed allowances will be established on consideration of a range of possible outcomes, which may include macroeconomic or non-macroeconomic scenarios, as appropriate.

Our assessment of significant increases in credit risk will be based on changes in probability-weighted forward-looking lifetime PD, using the same macroeconomic scenarios as the calculation of expected credit losses.

Expected life

For instruments in Stage 2 or Stage 3, loss allowances will cover expected credit losses over the expected remaining lifetime of the instrument. For most instruments, the expected life is limited to the remaining contractual life, adjusted as applicable for expected prepayments. However, an exemption from this limit is granted for instruments that include both a loan and undrawn commitment component and where our contractual ability to demand repayment and cancel the undrawn commitment does not limit our exposure to credit losses to the contractual notice period. For products in scope of this exemption, the expected life is the period over which our exposure to credit losses is not mitigated by our normal credit risk management actions. Determining the instruments in scope for this exemption and estimating the appropriate remaining life will require significant judgment.

Products identified as in scope of the lifetime exemption include credit cards, overdraft balances and certain revolving lines of credit. The expected life for these products will be determined using a behavioral life simulation, based on our historical experience.

Definition of default

The definition of default used in the measurement of expected credit losses and the assessment to determine movement between stages will be consistent with the definition of default used for internal credit risk management purposes. IFRS 9 does not define default, but contains a rebuttable presumption that default has occurred when an exposure is greater than 90 days past due. We will rebut this presumption for our Canadian and U.S. credit card assets, which use a definition of default of 180 days for both accounting and regulatory capital purposes, based on an analysis of write-off and cure rates which indicates that a more lagging criterion is appropriate.

Governance

As part of the implementation of IFRS 9, we have designed and implemented new controls and governance procedures in several areas that contribute to the calculation of expected credit losses. These include controls over credit risk data and systems, expected credit loss models and calculation engine, forecasts of future macroeconomic variables, design and probability-weighting of future macroeconomic scenarios, and the determination of significant increases in credit risk.

In addition to the existing risk management framework, we have established an Allowance Committee to provide oversight to the IFRS 9 impairment process. The Allowance Committee is comprised of senior representatives from Finance, Risk Management and Economics and will be responsible for reviewing and approving key inputs and assumptions used in our expected credit loss estimates. It also assesses the appropriateness of the overall allowance results to be included in our financial statements. We have also established the Business Advisory Working Group, comprised of senior representatives from the Business and Risk Management, which provides advice to the Allowance Committee on certain measurement methodology and assumptions. The new committee structure, with underlying key controls, went into operation in 2017.

Regulatory capital

Under the Basel III regulatory capital framework, any shortfall of accounting allowances to expected losses calculated according to the Basel rules for IRB portfolios is a deduction from CET1 capital. If accounting allowances exceed Basel expected losses, the excess is included as Tier 2 capital.

After the adoption of IFRS 9, expected loss models will be used for both regulatory capital and accounting purposes. Under both models, expected losses are calculated as the product of PD, LGD and EAD. However, there are several key differences under current Basel rules which could lead to significantly different expected loss estimates:

- Basel PDs are based on long-run averages over an entire economic cycle. IFRS 9 PDs are based on current conditions, adjusted for estimates of future conditions that will impact PD under several probability-weighted macroeconomic scenarios.
- Basel PDs consider the probability of default over the next 12 months. IFRS 9 PDs consider the probability of default over the next 12 months only for instruments in Stage 1. Expected credit losses for instruments in Stage 2 are calculated using lifetime PDs.
- Basel LGDs are based on severe but plausible downturn economic conditions. IFRS 9 LGDs are based on current conditions, adjusted for estimates of future conditions that will impact LGD under several probability-weighted macroeconomic scenarios.

As at October 31, 2017, our shortfall of accounting allowances under IAS 39 to Basel expected losses was \$1.2 billion. We expect the impact of the impairment requirements of IFRS 9 to reduce but not eliminate the shortfall of accounting allowances to Basel expected losses as at November 1, 2017. Going forward, the regulatory capital impact of further increases in our accounting allowances under IFRS 9 will be mitigated to the extent of the remaining deduction from CET1 capital.

Hedge accounting

The new hedge accounting model under IFRS 9 aims to simplify hedge accounting, align the accounting for hedge relationships more closely with an entity's risk management activities and permit hedge accounting to be applied more broadly to a greater variety of hedging instruments and risks eligible for hedge accounting.

The new standard does not explicitly address the accounting for macro hedging activities, which is being addressed by the IASB through a separate project. As a result, IFRS 9 includes an accounting policy choice to retain IAS 39 for hedge accounting requirements until the amended standard resulting from the IASB's project on macro hedge accounting is effective. We will elect the accounting policy choice to continue applying hedge accounting under the IAS 39 framework. The new hedge accounting disclosures required by the related amendments to IFRS 7 *Financial Instruments: Disclosures*, however, are required for the annual period beginning November 1, 2017.

Transition

To manage our transition to IFRS 9, we implemented a comprehensive enterprise-wide program led jointly by Finance and Risk Management that focuses on key areas of impact, including financial reporting, data, systems and processes, as well as communications and training. Throughout the project, we have provided regular updates to the Audit Committee, Risk Committee and senior management to ensure escalation of key issues and risks.

During fiscal 2015 and 2016, we completed initial assessments of the scope of IFRS 9, differences from IAS 39, classification of financial assets, financial and economic impacts, system and resource requirements, and key accounting interpretations. We also designed and began building the systems, models, controls and processes required to implement IFRS 9.

During fiscal 2017, we completed the following steps:

- Completed a parallel run of the full end to end process during the fourth quarter of 2017, the results of which were used to test our models and methodologies against our key performance indicators;
- Validated significant new impairment models;
- Completed documentation of updated bank-wide accounting and risk policies;
- Finalized governance and control frameworks over new processes and testing of internal controls;
- Documented the roll-out and implementation of the IFRS 9 project and governance structure including key controls;
- Continued to provide training and educational seminars to impacted internal stakeholders; and
- Prepared external disclosures to be provided on transition to IFRS 9 and going forward on a quarterly or annual basis.

IFRS 15 Revenue from Contracts with Customers (IFRS 15)

In May 2014, the IASB issued IFRS 15, which establishes the principles for reporting about the nature, amount, timing and uncertainty of revenue and cash flows arising from an entity's contracts with customers. The standard provides a single, principles based five-step model for revenue recognition to be applied to contracts with customers except for revenue arising from items such as financial instruments, insurance contracts and leases. The majority of our revenue, including net interest income, is not expected to be impacted. In April 2016, the IASB issued amendments to IFRS 15, which clarify the underlying principles of IFRS 15 and provide additional transitional relief on initial application. IFRS 15 and its amendments will be effective for us on November 1, 2018.

We plan to adopt IFRS 15 by adjusting our Consolidated Balance Sheet at November 1, 2018, the date of initial application, with no restatement of comparative periods.

To manage our transition to IFRS 15, we implemented a comprehensive enterprise-wide program and governance structure led by Finance that focuses on key areas of impact, including financial reporting, systems and processes, training, as well as communications.

During fiscal 2017, we have continued to manage the IFRS 15 program through detailed assessment of our higher-risk revenue contracts and accounting policies. In the upcoming year, we will continue our assessment of the remaining revenue contracts and finalize the changes required to our applicable transition, interim and annual disclosures. While our implementation efforts are not complete, aside from the limited changes necessary to comply with the enhanced presentation and disclosure requirements, we do not expect any material impacts of IFRS 15 on our Consolidated Financial Statements.

As we prepare for our transition to IFRS 15, we will continue to monitor industry interpretations of the new standard and expect to adjust our implementation accordingly.

IFRS 16 Leases (IFRS 16)

In January 2016, the IASB issued IFRS 16, which sets out the principles for the recognition, measurement, presentation and disclosure of leases. The standard removes the current requirement for lessees to classify leases as finance leases or operating leases by introducing a single lessee accounting model that requires the recognition of lease assets and lease liabilities on the balance sheet for most leases. Lessees will also recognize depreciation expense on the lease asset and interest expense on the lease liability in the statement of income. There are no significant changes to lessor accounting aside from enhanced disclosure requirements. IFRS 16 will be effective for us on November 1, 2019.

IAS 7 Statement of Cash Flows (IAS 7)

In January 2016, the IASB issued amendments to IAS 7, which will require specific disclosures for movements in certain liabilities on the statement of cash flows. These amendments will be effective for us on November 1, 2017 and will adopt these disclosures in our 2018 Consolidated Financial Statements. The adoption of these amendments is not expected to have a material impact on our consolidated financial statements.

IFRS 17 Insurance Contracts (IFRS 17)

In May 2017, the IASB issued IFRS 17 to establish a comprehensive global insurance standard which provides guidance on the recognition, measurement, presentation and disclosures of insurance contracts. This new standard will be effective for us on November 1, 2021. We are currently assessing the impact of adopting this standard on our Consolidated Financial Statements.

Regulatory developments

Global systemically important bank (G-SIB) designation

On November 21, 2017, Royal Bank of Canada was designated as a G-SIB by the FSB. We remain in consultation with OSFI and other relevant regulatory bodies to discuss and understand the impacts resulting from the G-SIB designation; however we do not expect any significant impacts resulting from the designation. In accordance with BCBS requirements, we will begin disclosing the detailed template used in the calculation of each of the 12 G-SIB indicators beginning in Q1 2018. The proposed 2018 CAR Guideline also clarifies that if, and when, a Canadian bank is designated a G-SIB, the higher of the D-SIB and G-SIB surcharges will apply.

BCBS Pillar 3 disclosure requirements

In April 2017, OSFI issued final guidelines for the first phase of the Pillar 3 disclosure requirements, indicating that all D-SIBs are expected to implement the “Revised Pillar 3 Disclosure Requirements”, issued by the BCBS in January 2015 for the reporting period ending October 31, 2018 (and referenced by BCBS as phase one). These guidelines replace existing disclosure requirements in the areas of credit risk, counterparty credit risk and securitization activities. We are making progress and expect to meet OSFI’s stated timeline.

In March 2017, the BCBS issued its second phase of the Pillar 3 disclosure requirements entitled, “*Pillar 3 disclosure requirements – consolidated and enhanced framework*”. The enhancements include the addition of a dashboard of key metrics and incorporates disclosure requirements related to ongoing reforms to the regulatory environment, such as the TLAC regime for G-SIBs, the proposed operational risk requirements, and the final standard for market risk. The disclosure standard also consolidates all existing Pillar 3 disclosure requirements of the Basel III framework, including the leverage and liquidity ratios disclosure templates. This phase two requirement, together with the phase one *Revised Pillar 3 disclosure requirements*, issued in January 2015, comprise the single Pillar 3 framework. OSFI has not yet released the implementation date for the BCBS phase two disclosure requirements.

The BCBS has commenced its work on the final phase of the Pillar 3 disclosure requirements, which includes the standardized approach RWA to benchmark internally modelled capital requirements, asset encumbrance, operational risk, and ongoing policy reform.

Capital treatment proposed or issued in connection with accounting changes

On March 29, 2017, the BCBS issued a standard with details on the interim regulatory treatment of accounting provisions under the Basel III regulatory capital framework. The standard addresses the impact of new expected credit loss accounting requirements under IFRS 9 *Financial Instruments* (IFRS 9) that will replace the current incurred loss models used for accounting purposes. IFRS 9 will be effective for us on November 1, 2017. For further details on the adoption of IFRS 9, including applicable regulatory guidance, refer to the Critical accounting policies and estimates section.

The standard retains the current regulatory treatment of accounting provisions under the standardized and the internal ratings-based approaches until a longer-term solution is developed. It also sets out transitional arrangements which allow for a phase-in of the impact of the new expected credit loss accounting standard on regulatory capital for up to five years, should individual jurisdictions choose to provide capital relief. OSFI has not adopted any of these transitional arrangements.

On August 21, 2017, OSFI announced its intention to delay the domestic implementation of the BCBS frameworks related to the Standardized Approach to Counterparty Credit Risk (SA-CCR) and the revisions to the capital requirements for bank exposures to Central counterparties until Q1 2019. In addition, in its communication, OSFI announced its intention to delay the implementation of the BCBS Revised Securitization Framework until Q1 2019.

Controls and procedures

Disclosure controls and procedures

Our disclosure controls and procedures are designed to provide reasonable assurance that information required to be disclosed by us in reports filed or submitted under Canadian and U.S. securities laws is recorded, processed, summarized and reported within the time periods specified under those laws and include controls and procedures that are designed to ensure that information is accumulated and communicated to management, including the President and Chief Executive Officer, and the Chief Financial Officer, to allow timely decisions regarding required disclosure.

As of October 31, 2017, management evaluated, under the supervision of and with the participation of the President and Chief Executive Officer and the Chief Financial Officer, the effectiveness of our disclosure controls and procedures as defined under rules adopted by the United States Securities and Exchange Commission (U.S. SEC). Based on that evaluation, the President and Chief Executive Officer and the Chief Financial Officer concluded that our disclosure controls and procedures were effective as of October 31, 2017.

Internal control over financial reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with IFRS. However, because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements on a timely basis. See Management’s Report on Internal Control over Financial Reporting and the Report of Independent Registered Public Accounting Firm.

No changes were made in our internal control over financial reporting during the year ended October 31, 2017 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Related party transactions

In the ordinary course of business, we provide normal banking services and operational services, and enter into other transactions with associated and other related corporations, including our joint venture entities, on terms similar to those offered to non-related parties. We grant loans to directors, officers and other employees at rates normally accorded to preferred clients. In addition, we offer deferred share and other plans to non-employee directors, executives and certain other key employees. For further information, refer to Notes 12 and 28 of our audited 2017 Annual Consolidated Financial Statements.

Supplementary information

Selected annual information

Table 77

(Millions of Canadian dollars, except as otherwise noted)	2017	2016	2015
Total revenue ⁽¹⁾	\$ 40,669	\$ 38,795	\$ 35,703
Net income attributable to:			
Shareholders	11,428	10,405	9,925
Non-controlling interest	41	53	101
	\$ 11,469	\$ 10,458	\$ 10,026
Basic earnings per share (in dollars)	7.59	6.80	6.75
Diluted earnings per share (in dollars)	7.56	6.78	6.73
Dividends declared per common shares (in dollars)	3.48	3.24	3.08
Total assets	1,212,853	1,180,258	1,074,208
Deposits	789,635	757,589	697,227

(1) Effective Q4 2017, certain commissions and fees paid and related revenue are presented on a gross basis in non-interest expense and non-interest income, respectively. Prior period amounts have been reclassified to conform with this presentation.

	Average balances		Interest		Average rate	
	2017	2016	2017	2016	2017	2016
(Millions of Canadian dollars, except for percentage amounts)						
Assets						
Deposits with other banks						
Canada	\$ 11,380	\$ 11,679	\$ 146	\$ 114	1.28%	0.98%
U.S.	21,508	16,842	192	71	0.89	0.42
Other International	17,215	15,415	(31)	(18)	(0.18)	(0.12)
	50,103	43,936	307	167	0.61%	0.38%
Securities						
Trading	130,816	153,114	3,520	3,366	2.69	2.20
Available-for-sale	83,787	72,440	1,379	1,227	1.65	1.69
	214,603	225,554	4,899	4,593	2.28	2.04
Asset purchased under reverse repurchase agreements and securities borrowed	205,993	191,243	3,021	1,816	1.47	0.95
Loans ⁽¹⁾						
Canada						
Retail	350,155	338,270	11,672	11,141	3.33	3.29
Wholesale	74,955	69,028	3,534	3,249	4.71	4.71
	425,110	407,298	15,206	14,390	3.58	3.53
U.S.	75,967	75,734	2,391	2,038	3.15	2.69
Other International	27,201	29,409	1,080	1,448	3.97	4.92
	528,278	512,441	18,677	17,876	3.54	3.49
Total interest-earning assets	998,977	973,174	26,904	24,452	2.69	2.51
Non-interest-bearing deposits with other banks	23,953	17,586	–	–	–	–
Customers' liability under acceptances	14,550	13,247	–	–	–	–
Other assets	149,114	172,393	–	–	–	–
Total assets	\$ 1,186,600	\$ 1,176,400	\$ 26,904	\$ 24,452	2.27%	2.08%
Liabilities and shareholders' equity						
Deposits ⁽²⁾						
Canada	\$ 498,134	\$ 487,194	\$ 5,560	\$ 4,714	1.12%	0.97%
U.S.	79,354	83,001	640	413	0.81	0.50
Other International	70,028	67,365	364	340	0.52	0.50
	647,516	637,560	6,564	5,467	1.01	0.86
Obligations related to securities sold short	37,205	50,262	1,515	1,579	4.07	3.14
Obligations related to assets sold under repurchase agreements and securities loaned	128,831	110,231	1,396	629	1.08	0.57
Subordinated debentures	9,460	8,931	270	227	2.85	2.54
Other interest-bearing liabilities	14,839	15,437	19	19	0.13	0.12
Total interest-bearing liabilities	837,851	822,421	9,764	7,921	1.17	0.96
Non-interest-bearing deposits	122,800	112,071	–	–	–	–
Acceptances	14,549	13,248	–	–	–	–
Other liabilities	138,797	159,215	–	–	–	–
Total liabilities	\$ 1,113,997	\$ 1,106,955	\$ 9,764	\$ 7,921	0.88%	0.72%
Equity	72,607	69,445	n.a.	n.a.	n.a.	n.a.
Total liabilities and shareholders' equity	\$ 1,186,600	\$ 1,176,400	\$ 9,764	\$ 7,921	0.82%	0.67%
Net interest income and margin	\$ 1,186,600	\$ 1,176,400	\$ 17,140	\$ 16,531	1.44%	1.41%
Net interest income and margin (average earning assets)						
Canada	\$ 595,790	\$ 572,671	\$ 12,104	\$ 11,694	2.03%	2.04%
U.S.	243,276	246,065	3,469	3,241	1.43	1.32
Other International	159,912	154,438	1,567	1,596	0.98	1.03
Total	\$ 998,978	\$ 973,174	\$ 17,140	\$ 16,531	1.72%	1.70%

(1) Interest income includes loan fees of \$561 million (2016 – \$573 million).

(2) Deposits include personal savings deposits with average balances of \$178 billion (2016 – \$166 billion), interest expense of \$5 billion (2016 – \$4 billion) and average rates of .3% (2016 – .3%). Deposits also include term deposits with average balances of \$353 billion (2016 – \$362 billion), interest expense of \$5.0 billion (2016 – \$4.3 billion) and average rates of 1.42% (2016 – 1.20%).

	2017 ⁽¹⁾ vs. 2016		
	Increase (decrease) due to changes in		
	Average volume ⁽²⁾	Average rate ⁽²⁾	Net change
(Millions of Canadian dollars)			
Assets			
Deposits with other banks			
Canada ⁽³⁾	\$ (3)	\$ 35	\$ 32
U.S. ⁽³⁾	20	101	121
Other international ⁽³⁾	(2)	(11)	(13)
Securities			
Trading	(490)	644	154
Available-for-sale	192	(40)	152
Asset purchased under reverse repurchase agreements and securities borrowed	140	1,065	1,205
Loans			
Canada			
Retail	391	140	531
Wholesale	279	6	285
U.S.	6	347	353
Other international	(109)	(259)	(368)
Total interest income	\$ 424	\$ 2,028	\$ 2,452
Liabilities			
Deposits			
Canada	106	740	846
U.S.	(18)	245	227
Other international	13	11	24
Obligations related to securities sold short	(410)	346	(64)
Obligations related to assets sold under repurchase agreements and securities loaned	106	661	767
Subordinated debentures	13	30	43
Other interest-bearing liabilities	(1)	1	-
Total interest expense	\$ (191)	\$ 2,034	\$ 1,843
Net interest income	\$ 615	\$ (6)	\$ 609

(1) Insurance segment assets and liabilities are included in Other assets and Other liabilities, respectively.

(2) Volume/rate variance is allocated on the percentage relationships of changes in balances and changes in rates to the total net change in net interest income.

(3) Geographic classification for selected assets and liabilities is based on the domicile of the booking point of the subject assets and liabilities.

Loans and acceptances by geography

Table 80

As at October 31 (Millions of Canadian dollars)	2017	2016	2015	2014	2013
Canada					
Residential mortgages	\$ 255,799	\$ 241,800	\$ 229,987	\$ 215,624	\$ 206,134
Personal	82,022	82,205	84,637	86,984	86,102
Credit cards	17,491	16,601	15,516	14,650	13,902
Small business	4,493	3,878	4,003	4,067	4,026
Retail	359,805	344,484	334,143	321,325	310,164
Business	88,453	76,266	71,246	64,643	58,920
Sovereign ⁽¹⁾	9,379	8,586	8,508	3,840	3,807
Bank	1,326	1,278	530	413	823
Wholesale	\$ 99,158	\$ 86,130	\$ 80,284	\$ 68,896	\$ 63,550
	\$ 458,963	\$ 430,614	\$ 414,427	\$ 390,221	\$ 373,714
U.S.					
Retail	18,100	17,134	5,484	4,686	3,734
Wholesale	55,037	59,349	34,702	23,639	19,443
	73,137	76,483	40,186	28,325	23,177
Other International					
Retail	7,265	7,852	8,556	8,258	6,768
Wholesale	21,870	21,733	24,536	21,881	17,103
	29,135	29,585	33,092	30,139	23,871
Total loans and acceptances	\$ 561,235	\$ 536,682	\$ 487,705	\$ 448,685	\$ 420,762
Total allowance for loan losses	(2,159)	(2,235)	(2,029)	(1,994)	(1,959)
Total loans and acceptances, net of allowance for loan losses	\$ 559,076	\$ 534,447	\$ 485,676	\$ 446,691	\$ 418,803

(1) In 2015, we reclassified \$4 billion from AFS securities to Loans.

Loans and acceptances by portfolio and sector

Table 81

As at October 31 (Millions of Canadian dollars)	2017	2016	2015	2014	2013
Residential mortgages	\$ 270,348	\$ 254,998	\$ 233,975	\$ 219,257	\$ 209,238
Personal	92,294	93,466	94,346	96,021	93,260
Credit cards	18,035	17,128	15,859	14,924	14,142
Small business	4,493	3,878	4,003	4,067	4,026
Retail	\$ 385,170	\$ 369,470	\$ 348,183	\$ 334,269	\$ 320,666
Business					
Agriculture	7,380	6,515	6,057	5,694	5,441
Automotive	8,248	7,279	6,614	6,209	6,167
Consumer goods	11,387	10,052	7,146	7,172	6,230
Energy					
Oil & gas	6,743	6,259	7,691	5,849	5,046
Utilities	5,614	7,680	5,162	3,766	3,860
Financing products	6,556	8,840	10,093	3,670	3,162
Forest products	911	1,099	1,169	979	893
Health services	6,998	7,763	6,023	4,052	3,786
Holding and investments	8,803	7,195	6,935	6,865	4,973
Industrial products	5,581	5,508	4,725	4,665	4,038
Mining & metals	1,113	1,455	1,402	1,320	1,074
Non-bank financial services	10,744	8,408	6,428	5,688	4,903
Other services	14,757	11,582	8,834	8,322	8,090
Real estate & related	46,197	40,419	33,802	30,387	24,413
Technology & media	8,890	11,019	6,599	4,822	4,006
Transportation & environment	5,950	6,060	5,907	5,432	5,593
Other	4,570	7,568	3,248	3,695	2,705
Sovereign	11,362	10,581	9,887	4,628	4,396
Bank	4,261	1,930	1,800	1,201	1,320
Wholesale	\$ 176,065	\$ 167,212	\$ 139,522	\$ 114,416	\$ 100,096
Total loans and acceptances	\$ 561,235	\$ 536,682	\$ 487,705	\$ 448,685	\$ 420,762
Total allowance for loan losses	(2,159)	(2,235)	(2,029)	(1,994)	(1,959)
Total loans and acceptances, net of allowance for loan losses	\$ 559,076	\$ 534,447	\$ 485,676	\$ 446,691	\$ 418,803

Impaired loans by portfolio and geography
Table 82

As at October 31 (Millions of Canadian dollars, except for percentage amounts)

	2017	2016	2015	2014	2013
Residential mortgages	\$ 634	\$ 709	\$ 646	\$ 678	\$ 691
Personal	276	304	299	300	363
Small business	38	46	45	47	37
Retail	948	1,059	990	1,025	1,091
Business					
Agriculture	\$ 28	\$ 43	\$ 41	\$ 40	\$ 43
Automotive	29	43	11	12	12
Consumer goods	105	165	130	108	101
Energy					
Oil and gas	315	1,264	156	6	14
Utilities	10	78	57	–	–
Financing products	107	111	109	–	39
Forest products	7	21	28	25	26
Health services	21	21	17	18	25
Holding and investments	27	72	185	132	40
Industrial products	34	43	45	48	54
Mining & metals	3	15	17	9	2
Non-bank financial services	32	3	1	3	1
Other services	157	109	69	99	101
Real estate & related	345	241	297	314	367
Technology & media	82	93	34	38	117
Transportation & environment	23	45	53	32	98
Other	47	57	43	66	67
Sovereign	–	–	–	–	–
Bank	–	2	2	2	3
Wholesale	1,372	2,426	1,295	952	1,110
Acquired credit-impaired loans	256	418	–	–	–
Total impaired loans (1)	\$ 2,576	\$ 3,903	\$ 2,285	\$ 1,977	\$ 2,201
Canada					
Residential mortgages	\$ 323	\$ 368	\$ 356	\$ 388	\$ 464
Personal	198	228	223	224	229
Small business	38	46	45	47	36
Retail	559	642	624	659	729
Business					
Agriculture	22	34	39	36	38
Automotive	4	9	8	11	9
Consumer goods	45	91	65	70	58
Energy					
Oil & gas	13	57	39	4	14
Utilities	–	15	20	–	–
Financing products	–	–	–	–	–
Forest products	7	21	5	6	8
Health services	5	18	17	19	15
Holding and investments	3	5	3	3	3
Industrial products	25	39	39	41	40
Mining & metals	3	12	7	9	2
Non-bank financial services	29	–	–	1	1
Other services	48	49	51	67	59
Real estate & related	187	121	161	171	169
Technology & media	12	27	34	37	86
Transportation & environment	23	24	29	11	21
Other	–	–	(5)	1	3
Sovereign	–	–	–	–	–
Bank	–	–	–	–	–
Wholesale	426	522	512	487	526
Total	\$ 985	\$ 1,164	\$ 1,136	\$ 1,146	\$ 1,255
U.S.					
Retail	\$ 59	\$ 56	\$ 10	\$ 13	\$ 14
Wholesale	736	1,736	204	18	98
Total	\$ 795	\$ 1,792	\$ 214	\$ 31	\$ 112
Other International					
Retail	\$ 345	\$ 380	\$ 356	\$ 353	\$ 348
Wholesale	451	567	579	447	486
Total	\$ 796	\$ 947	\$ 935	\$ 800	\$ 834
Total impaired loans	\$ 2,576	\$ 3,903	\$ 2,285	\$ 1,977	\$ 2,201
Allowance for impaired loans	(737)	(809)	(654)	(632)	(599)
Net impaired loans	\$ 1,839	\$ 3,094	\$ 1,631	\$ 1,345	\$ 1,602
Gross impaired loans as a % of loans and acceptances					
Residential mortgages	0.23%	0.28%	0.28%	0.31%	0.33%
Personal	0.30%	0.33%	0.32%	0.31%	0.39%
Small business	0.85%	1.19%	1.13%	1.16%	0.83%
Retail	0.25%	0.29%	0.28%	0.31%	0.34%
Wholesale	0.92%	1.69%	0.93%	0.84%	1.11%
Total	0.46%	0.73%	0.47%	0.44%	0.52%
Allowance for impaired loans as a % of gross impaired loans	28.61%	20.72%	28.64%	31.98%	27.22%

(1) Past due loans greater than 90 days not included in impaired loans were \$307 million in 2017 (2016 – \$337 million; 2015 – \$314 million; 2014 – \$316 million; 2013 – \$346 million). For further details, refer to Note 5 of our 2017 Annual Consolidated Financial Statements.

Provision for credit losses by portfolio and geography

Table 83

(Millions of Canadian dollars, except for percentage amounts)	2017	2016	2015	2014	2013
Residential mortgages	\$ 56	\$ 77	\$ 47	\$ 94	\$ 41
Personal	409	458	388	441	458
Credit cards	435	442	378	353	354
Small business	32	34	32	44	32
Retail	\$ 932	\$ 1,011	\$ 845	\$ 932	\$ 885
Business					
Agriculture	\$ 2	\$ 10	\$ 9	\$ 3	\$ 4
Automotive	14	13	3	2	3
Consumer goods	11	20	33	27	17
Energy					
Oil and gas	(27)	320	47	(5)	(6)
Utilities	5	16	9	32	-
Financing products	(19)	1	39	3	1
Forest products	4	4	6	7	4
Health services	10	4	-	-	-
Holding and investments	1	-	18	29	(6)
Industrial products	16	12	4	14	21
Mining & metals	(4)	7	8	2	1
Non-bank financial services	2	-	7	-	10
Other services	20	(5)	4	18	14
Real estate & related	115	36	29	58	62
Technology & media	13	8	5	14	157
Transportation & environment	-	(4)	8	2	35
Other	53	36	24	26	35
Sovereign	-	-	-	-	-
Bank	-	(3)	(1)	-	-
Wholesale	\$ 216	\$ 475	\$ 252	\$ 232	\$ 352
Acquired credit-impaired loans	2	10	-	-	-
Total provision for credit losses on impaired loans	\$ 1,150	\$ 1,496	\$ 1,097	\$ 1,164	\$ 1,237
Canada					
Residential mortgages	\$ 33	\$ 42	\$ 27	\$ 27	\$ 27
Personal	413	459	393	393	391
Credit cards	426	435	371	345	346
Small business	32	34	32	44	32
Retail	\$ 904	\$ 970	\$ 823	\$ 809	\$ 796
Business					
Agriculture	-	10	9	4	4
Automotive	1	3	3	3	3
Consumer goods	11	19	21	25	16
Energy					
Oil & gas	(15)	99	22	(5)	(6)
Utilities	1	-	1	-	-
Financial products	-	-	-	-	-
Forest products	4	5	1	1	3
Health services	7	4	-	-	-
Holding and investments	-	-	-	-	(8)
Industrial products	13	10	7	14	14
Mining & metals	1	7	3	2	1
Non-bank financial services	2	-	-	-	-
Other services	21	14	-	6	3
Real estate & related	38	26	13	34	37
Technology & media	10	2	6	14	50
Transportation & environment	2	8	7	3	2
Other	(1)	6	23	22	30
Sovereign	-	-	-	-	-
Bank	-	-	-	-	-
Wholesale	\$ 95	\$ 213	\$ 116	\$ 123	\$ 149
Total	\$ 999	\$ 1,183	\$ 939	\$ 932	\$ 945
U.S.					
Retail	3	1	1	2	3
Wholesale	117	227	40	40	32
	\$ 120	\$ 228	\$ 41	\$ 42	\$ 35
Other International					
Retail	25	41	21	121	86
Wholesale	6	44	96	69	171
	\$ 31	\$ 85	\$ 117	\$ 190	\$ 257
Total provision for credit losses on impaired loans	\$ 1,150	\$ 1,496	\$ 1,097	\$ 1,164	\$ 1,237
Total provision for credit losses on non-impaired loans	-	50	-	-	-
Total provision for credit losses	\$ 1,150	\$ 1,546	\$ 1,097	\$ 1,164	\$ 1,237
Total PCL as a % of average net loans and acceptances	0.21%	0.29%	0.24%	0.27%	0.31%
PCL on impaired loans as a % of average net loans and acceptances	0.21%	0.28%	0.24%	0.27%	0.31%

Allowance for credit losses by portfolio and geography
Table 84

(Millions of Canadian dollars, except percentage amounts)	2017	2016	2015	2014	2013
Allowance at beginning of year	\$ 2,326	\$ 2,120	\$ 2,085	\$ 2,050	\$ 2,087
Provision for credit losses	1,150	1,546	1,097	1,164	1,237
Write-offs by portfolio					
Residential mortgages	(53)	(42)	(64)	(30)	(24)
Personal	(543)	(556)	(494)	(565)	(498)
Credit cards	(565)	(564)	(497)	(466)	(466)
Small business	(38)	(40)	(40)	(47)	(35)
Retail	\$ (1,199)	\$ (1,202)	\$ (1,095)	\$ (1,108)	\$ (1,023)
Business	\$ (226)	\$ (321)	\$ (243)	\$ (221)	\$ (448)
Sovereign	–	–	–	–	–
Bank	–	–	–	–	–
Wholesale	\$ (226)	\$ (321)	\$ (243)	\$ (221)	\$ (448)
Total write-offs by portfolio	\$ (1,425)	\$ (1,523)	\$ (1,338)	\$ (1,329)	\$ (1,471)
Recoveries by portfolio					
Residential mortgages	\$ 8	\$ 5	\$ 7	\$ 2	\$ 2
Personal	116	111	105	106	96
Credit cards	131	122	119	114	112
Small business	9	10	10	9	9
Retail	\$ 264	\$ 248	\$ 241	\$ 231	\$ 219
Business	\$ 66	\$ 38	\$ 33	\$ 32	\$ 51
Sovereign	–	–	–	–	–
Bank	–	–	1	–	–
Wholesale	\$ 66	\$ 38	\$ 34	\$ 32	\$ 51
Total recoveries by portfolio	\$ 330	\$ 286	\$ 275	\$ 263	\$ 270
Net write-offs	\$ (1,095)	\$ (1,237)	\$ (1,063)	\$ (1,066)	\$ (1,201)
Adjustments (1)	(131)	(103)	1	(63)	(73)
Total allowance for credit losses at end of year	\$ 2,250	\$ 2,326	\$ 2,120	\$ 2,085	\$ 2,050
Allowance against impaired loans					
Canada					
Residential mortgages	\$ 31	\$ 35	\$ 27	\$ 31	\$ 36
Personal	91	105	96	93	97
Small business	19	20	19	19	16
Retail	\$ 141	\$ 160	\$ 142	\$ 143	\$ 149
Business					
Agriculture	\$ 3	\$ 6	\$ 5	\$ 6	\$ 6
Automotive	4	4	4	4	4
Consumer goods	11	14	12	22	15
Energy					
Oil & gas	3	6	–	–	1
Utilities	–	–	1	–	–
Financing products	–	–	–	–	–
Forest products	3	5	3	3	4
Health services	6	6	6	6	6
Holding and investments	1	1	1	1	2
Industrial products	13	11	13	18	15
Mining and metals	4	4	1	1	1
Non-bank financial services	1	–	–	–	–
Other services	19	18	19	28	23
Real estate & related	36	23	28	48	42
Technology & media	11	10	12	17	46
Transportation & environment	8	11	7	5	6
Other	1	–	(1)	1	(1)
Sovereign	–	–	–	–	–
Bank	–	–	–	–	–
Wholesale	\$ 124	\$ 119	\$ 111	\$ 160	\$ 170
	\$ 265	\$ 279	\$ 253	\$ 303	\$ 319
U.S.					
Retail	\$ 1	\$ 2	\$ 1	\$ 1	\$ 2
Wholesale	150	177	47	16	19
	\$ 151	\$ 179	\$ 48	\$ 17	\$ 21
Other International					
Retail	\$ 168	\$ 180	\$ 169	\$ 172	\$ 146
Wholesale	153	171	184	140	113
	\$ 321	\$ 351	\$ 353	\$ 312	\$ 259
Total allowance against impaired loans	\$ 737	\$ 809	\$ 654	\$ 632	\$ 599
Allowance against non-impaired loans					
Residential mortgages	\$ 128	\$ 96	\$ 83	\$ 78	\$ 48
Personal	391	385	396	400	405
Credit cards	379	386	386	385	385
Small business	37	45	45	45	45
Retail	\$ 935	\$ 912	\$ 910	\$ 908	\$ 883
Wholesale	\$ 487	\$ 514	\$ 465	\$ 454	\$ 477
Off-balance sheet and other items	\$ 91	\$ 91	\$ 91	\$ 91	\$ 91
Total allowance against non-impaired loans	\$ 1,513	\$ 1,517	\$ 1,466	\$ 1,453	\$ 1,451
Total allowance for credit losses	\$ 2,250	\$ 2,326	\$ 2,120	\$ 2,085	\$ 2,050
Key ratios					
Allowance for credit losses as a % of loans and acceptances	0.40%	0.43%	0.43%	0.46%	0.49%
Net write-offs as a % of average net loans and acceptances	0.20%	0.23%	0.23%	0.25%	0.30%

(1) Under IFRS, other adjustments include \$104 million of unwind of discount and \$27 million of changes in exchange rate (2016 – \$100 million and \$3 million; 2015 – \$80 million and \$(81) million; 2014 – \$87 million and \$(24) million). For further details, refer to Note 5 of our 2017 Annual Consolidated Financial Statements.

Credit quality information by Canadian province

Table 85

(Millions of Canadian dollars)	2017	2016	2015	2014	2013
Loans and acceptances					
Atlantic provinces (1)	\$ 24,471	\$ 23,947	\$ 23,040	\$ 22,130	\$ 21,263
Quebec	56,749	53,518	51,197	50,748	48,060
Ontario	202,272	185,434	175,315	159,817	152,258
Alberta	68,051	66,277	64,902	61,197	58,318
Other Prairie provinces (2)	31,318	30,143	29,490	27,341	25,697
B.C. and territories (3)	76,102	71,295	70,483	68,988	68,118
Total loans and acceptances in Canada	\$ 458,963	\$ 430,614	\$ 414,427	\$ 390,221	\$ 373,714
Gross impaired loans					
Atlantic provinces (1)	\$ 77	\$ 101	\$ 93	\$ 81	\$ 83
Quebec	176	207	213	205	177
Ontario	213	336	341	391	424
Alberta	284	313	224	185	233
Other Prairie provinces (2)	125	93	115	73	97
B.C. and territories (3)	110	114	150	211	241
Total gross impaired loans in Canada	\$ 985	\$ 1,164	\$ 1,136	\$ 1,146	\$ 1,255
Provision for credit losses on impaired loans					
Atlantic provinces (1)	\$ 66	\$ 67	\$ 57	\$ 51	\$ 50
Quebec	85	92	96	92	78
Ontario	617	654	590	588	605
Alberta	112	226	77	71	74
Other Prairie provinces (2)	64	64	52	40	39
B.C. and territories (3)	55	80	67	90	99
Total provision for credit losses on impaired loans in Canada	\$ 999	\$ 1,183	\$ 939	\$ 932	\$ 945

(1) Comprises Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.

(2) Comprises Manitoba and Saskatchewan.

(3) Comprises British Columbia, Nunavut, Northwest Territories and Yukon.

We aim to present transparent, high-quality risk disclosures by providing disclosures in our 2017 Annual Report and Supplementary Financial Information package (SFI), in accordance with recommendations from the Financial Stability Board's (FSB) Enhanced Disclosure Task Force (EDTF).

The following index summarizes our disclosure by EDTF recommendation:

Type of Risk	Recommendation	Disclosure	Location of disclosure	
			Annual Report page	SFI page
General	1	Table of contents for EDTF risk disclosure	116	1
	2	Define risk terminology and measures	52, 54-57 206-207	–
	3	Top and emerging risks	53	–
	4	New regulatory ratios	92-95	–
Risk governance, risk management and business model	5	Risk management organization	52, 54-57	–
	6	Risk culture	54-57	–
	7	Risk in the context of our business activities	100	–
	8	Stress testing	56-57, 69	–
Capital adequacy and risk-weighted assets (RWA)	9	Minimum Basel III capital ratios and Domestic systemically important bank surcharge	92-95	–
	10	Composition of capital and reconciliation of the accounting balance sheet to the regulatory balance sheet	–	21-24
	11	Flow statement of the movements in regulatory capital	–	25
	12	Capital strategic planning	92-95	–
	13	RWA by business segments	–	28
	14	Analysis of capital requirement, and related measurement model information	58-60	26-27
	15	RWA credit risk and related risk measurements	–	42-44
Liquidity	16	Movement of risk-weighted assets by risk type	–	28
	17	Basel back-testing	55, 58	42
	18	Quantitative and qualitative analysis of our liquidity reserve	75-77, 81-82	–
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	20	Maturity analysis of consolidated total assets, liabilities and off-balance sheet commitments analyzed by remaining contractual maturity at the balance sheet date	82-83	–
	21	Sources of funding and funding strategy	77-79	–
Market risk	22	Relationship between the market risk measures for trading and non-trading portfolios and the balance sheet	73-74	–
	23	Decomposition of market risk factors	68-72	–
	24	Market risk validation and back-testing	69	–
	25	Primary risk management techniques beyond reported risk measures and parameters	68-72	–
Credit risk	26	Bank's credit risk profile	58-68, 154-156	31-44
		Quantitative summary of aggregate credit risk exposures that reconciles to the balance sheet	111-115	40
	27	Policies for identifying impaired loans	59-60, 101-102, 130	–
	28	Reconciliation of the opening and closing balances of impaired loans and impairment allowances during the year	–	33,37
	29	Quantification of gross notional exposure for OTC derivatives or exchange-traded derivatives	61-62	46
	30	Credit risk mitigation, including collateral held for all sources of credit risk	60	41
Other	31	Other risk types	84-91	–
	32	Publicly known risk events	87-89, 193-194	–