UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 40-F

[Check one]

¨ REGISTRATION STATEMENT PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

OR

x ANNUAL REPORT PURSUANT TO SECTION 13(a) OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended October 31, 2016 Commission File Number 001-13928

ROYAL BANK OF CANADA

(Exact name of Registrant as specified in its charter)

Canada	6029	Not Applicable
(Province or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number (if applicable))	(I.R.S. Employer Identification Number (if applicable))

200 Bay Street
Royal Bank Plaza
Toronto, Ontario
Canada M5J 2J5
Attention: Karen E. McCarthy
Vice-President, Associate General Counsel & Secretary
(416) 974-2256
(Address and telephone number of Registrant's principal executive offices)

Royal Bank of Canada
30 Hudson Street
27th Floor
Jersey City, New Jersey, 07302-4699
Attention: Kevin Genirs
(212) 858-7111
(Name, address (including zip code) and telephone number (including area code) of agent for service in the United States)

copies of all correspondence should be sent to:

Paul Guthrie
Royal Bank of Canada
200 Bay Street
Toronto, Ontario
Canada M5J 2J5
Tel: (416) 974-2774

Donald R. Crawshaw
Sullivan & Cromwell LLP
125 Broad Street
New York, New York
USA 10004-2498
Tel: (212) 558-4000

Securities registered or to be registered pursuant to Section 12(b) of the Act.

Title of each class	Name of each exchange on which registered
Common Shares	New York Stock Exchange
Royal Bank of Canada Exchange Traded Notes due July 19, 2034 Linked to the Yorkville MLP Distribution Growth Leaders Liquid℠ PR Index	Nasdaq Global Market
Royal Bank of Canada Exchange Traded Notes due June 20, 2036 Linked to the S&P 500® Trend Allocator PR Index	

Securities registered or to be registered pursuant to Section 12(g) of the Act.

Not Applicable
(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act.

Not Applicable
(Title of Class)

For annual reports, indicate by check mark the information filed with this Form:

x Annual information form x Audited annual financial statements

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report.

Common Shares	1,485,393,572
First Preferred Shares	
Series W	12,000,000
Series AA	12,000,000
Series AB	12,000,000
Series AC	8,000,000
Series AD	10,000,000
Series AE	10,000,000
Series AF	8,000,000
Series AG	10,000,000
Series AJ	13,578,815
Series AK	2,421,185
Series AL	12,000,000
Series AZ	20,000,000
Series BB	20,000,000
Series BD	24,000,000
Series BF	12,000,000
Series BH	6,000,000
Series BI	6,000,000
Series BJ	6,000,000
Series C-1	82,050
Series C-2	20,385
Series BK	29,000,000
Series BM	30,000,000

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days.

Yes x No ¨

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit and post such files).

Yes ¨ No ¨

Not Applicable

CONTROLS AND PROCEDURES

Information about disclosure controls and procedures and internal control over financial reporting can be found under “Controls and procedures” on page 107 of our Management’s Discussion and Analysis set forth in Exhibit 2, and under “Management’s Report on Internal Control over Financial Reporting” which can be found on pages 117 and 118 of our Financial Review set forth in Exhibit 2, which sections are incorporated by reference.

AUDIT COMMITTEE FINANCIAL EXPERTS

The Registrant’s board of directors has determined that it has six audit committee financial experts serving on its audit committee. W. Geoffrey Beattie, Jacynthe Côté, David F. Denison, Alice D. Laberge, Thomas A. Renyi, and Thierry Vandal have been determined to be such audit committee financial experts and are independent, as that term is defined by the New York Stock Exchange’s listing standards applicable to the Registrant. The U.S. Securities and Exchange Commission (the “SEC”) has indicated that the designation of W. Geoffrey Beattie, Jacynthe Côté, David F. Denison, Alice D. Laberge, Thomas A. Renyi and Thierry Vandal as audit committee financial experts does not make any of them an “expert” for any purpose, impose any duties, obligations or liability on W. Geoffrey Beattie, Jacynthe Côté, David F. Denison, Alice D. Laberge, Thomas A. Renyi and Thierry Vandal that are greater than those imposed on members of the audit committee and board of directors who do not carry this designation or affect the duties, obligations or liability of any other member of the audit committee.

CODE OF ETHICS

The Registrant has adopted a code of ethics (the “Code of Conduct”) that applies to all employees, contract workers and members of the board of directors, including its principal executive officer, principal financial officer and principal accounting officer. The full text of the Code of Conduct is set forth in Exhibit 4 and is also available on our website at rbc.com.

PRINCIPAL ACCOUNTANT FEES AND SERVICES

Information about principal accountant fees and services and a brief description of our pre-approval policies and procedures can be found under “Audit Committee” beginning on page 23 of our Annual Information Form set forth in Exhibit 1, which section is incorporated by reference. A copy of our pre-approval policies and procedures can be found in Appendix D of our Annual Information Form, which section is incorporated by reference.

OFF-BALANCE SHEET ARRANGEMENTS

Information about off-balance sheet arrangements can be found under “Off-balance sheet arrangements” beginning on page 44 of our Management’s Discussion and Analysis set forth in Exhibit 2, which section is incorporated by reference.

TABULAR DISCLOSURE OF CONTRACTUAL OBLIGATIONS

Tabular disclosure of contractual obligations can be found under “Risk management – Liquidity and funding risk” beginning on page 72 of our Management’s Discussion and Analysis set forth in Exhibit 2, which section is incorporated by reference.

IDENTIFICATION OF THE AUDIT COMMITTEE

The Registrant has a separately-designated standing audit committee. Information about the audit committee can be found under “Audit Committee” beginning on page 23 of our Annual Information Form set forth in Exhibit 1, which section is incorporated by reference.

UNDERTAKING

The Registrant undertakes to make available, in person or by telephone, representatives to respond to inquiries made by the Commission staff, and to furnish promptly, when requested to do so by the Commission staff, information relating to: the securities in relation to which the obligation to file an annual report on Form 40-F arises; or transactions in said securities.

SUMMARY OF DIFFERENCES FROM NYSE AND NASDAQ CORPORATE GOVERNANCE RULES

A summary of significant ways corporate governance practices followed by the Registrant differ from corporate governance practices required to be followed by U.S. Domestic Companies under the New York Stock Exchange’s listing standards (disclosure required by section 303A.11 of the NYSE Listed Company Manual) and a summary of ways corporate governance practices followed by the Registrant differ from corporate governance practices required to be followed by U.S. Domestic Companies under the Nasdaq Stock Market’s corporate governance requirements (disclosure required by section 5615(a)(3) of the Nasdaq Stock Market Rules) are available on the Registrant’s corporate governance website at rbc.com/governance.

DISCLOSURE PURSUANT TO SECTION 13(r) OF THE SECURITIES EXCHANGE ACT OF 1934

In accordance with section 13(r) of the U.S. Securities Exchange Act of 1934, we are required to disclose certain Iran-related activities. We maintain a robust economic sanctions compliance program which monitors compliance with economic sanctions requirements in the jurisdictions in which we operate and we believe we have been in compliance with relevant economic sanctions legislation throughout fiscal 2016.

We currently maintain certain non-U.S. dollar denominated accounts for the Embassy of the Islamic Republic of Iran in Canada (the “Iranian Embassy”). Any funds in these accounts are frozen by Ontario court order in connection with civil litigation, which is being monitored.

In fiscal 2016, these accounts generated less than $3,000 in gross revenue and less than $3,000 in net income.

SIGNATURES

Pursuant to the requirements of the Exchange Act, the Registrant certifies that it meets all of the requirements for filing on Form 40-F and has duly caused this annual report to be signed on its behalf by the undersigned, thereto duly authorized.

ROYAL BANK OF CANADA

By: /s/ David I. McKay
Name: David I. McKay
Title: President and Chief Executive Officer

Date: November 30, 2016

EXHIBITS

INDEX TO EXHIBITS

Exhibit	Exhibit No.
Royal Bank of Canada Annual Information Form dated November 29, 2016	1
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ROYAL BANK OF CANADA

ANNUAL INFORMATION FORM

November 29, 2016

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 Annual Information Form and in the documents incorporated by reference herein, in other filings with Canadian regulators or the United States (U.S.) Securities and Exchange Commission (SEC), in reports to shareholders and in other communications. Forward-looking statements in this document and in the documents incorporated by reference herein include, but are not limited to, statements relating to our financial performance objectives, vision and strategic goals, the economic and market review and outlook for Canadian, U.S., European and global economies, the regulatory environment in which we operate, the outlook and priorities for each of our business segments, and the risk environment including our liquidity and funding risk as set out in the 2016 Management's Discussion and Analysis. The forward-looking information contained in this Annual Information Form and in the documents incorporated by reference 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 Risk management and Overview of other risks sections of our 2016 Management's Discussion and Analysis; global uncertainty, the Brexit vote to have the United Kingston leave the European Union, weak oil and gas prices, cyber risk, anti-money laundering, exposure to more volatile sectors, technological innovation and new fintech entrants, increasing complexity of regulation, data management, litigation and administrative penalties; 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 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 Annual Information Form are set out in our 2016 Management's Discussion and Analysis under the heading Overview and outlook and for each business segment under the heading Outlook and priorities. 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 Risk management and Overview of other risks sections of our 2016 Management's Discussion and Analysis.

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*Notes 19, 21 and 27 to the 2016 Annual Consolidated Financial Statements for Royal Bank of Canada are incorporated by reference herein.

INFORMATION IS AT OCTOBER 31, 2016, UNLESS OTHERWISE NOTED.

CORPORATE STRUCTURE

Name, Address and Incorporation[1]

Royal Bank of Canada is a Schedule I bank under the *Bank Act* (Canada), which constitutes its charter. The Bank was created as Merchants Bank in 1864 and was incorporated under the "Act to Incorporate the Merchants' Bank of Halifax" assented to June 22, 1869. The Bank changed its name to The Royal Bank of Canada in 1901 and to Royal Bank of Canada in 1990.

The Bank's corporate headquarters are located at Royal Bank Plaza, 200 Bay Street, Toronto, Ontario, Canada and its head office is located at 1 Place Ville-Marie, Montreal, Quebec, Canada.

Intercorporate Relationships

Information about intercorporate relationships with principal subsidiaries, including place of incorporation and percentage of securities owned by the Bank, is provided in Appendix A.

GENERAL DEVELOPMENT OF THE BUSINESS

Three Year History

Through our business strategies and actions we pursue 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.

The Canadian economy grew during 2014 driven by solid consumer spending and strength in the labour market on employment gains. Equity markets in Canada, the U.S. and major European economies also generally exhibited capital appreciation through most of fiscal 2014. In 2014, RBC delivered strong performance, underpinned by the strength and diversity of our business. As part of the planned transition announced in 2013, David McKay assumed the role of President and Chief Executive Officer, following the retirement of Gord Nixon, and Jennifer Tory was appointed Group Head, Personal & Commercial Banking. In addition, Mark Hughes was appointed Chief Risk Officer, following the retirement of Morten Friis, and Bruce Ross joined RBC to become Group Head, Technology and Operations. Finally, following David O'Brien's retirement, Kathleen Taylor became the Chair of the Board of Directors of RBC.

The Canadian economy showed moderate growth during 2015 driven by some recovery in energy production in the second half of the year and higher exports. Equity markets in Canada and the U.S., however, remained volatile throughout our fiscal year.

[1] When we say "we", "us", "our", or "RBC", we mean Royal Bank of Canada and its subsidiaries, as applicable. References to "the Bank" mean Royal Bank of Canada without its subsidiaries.

In 2015, RBC delivered solid operating results across most of our business segments and strong credit quality. In addition, on November 2, 2015, RBC completed the acquisition of City National Corporation (City National), the holding company for City National Bank, which gives us an expansion platform for long-term growth in the U.S. and provides us with the opportunity to enhance and complement our existing U.S. businesses in line with our strategic goals.

The Canadian economy continued to show moderate growth during calendar 2016 supported by solid consumer spending and housing activity in the first half of the year. Despite weak business investment and weakness in the energy sector which was compounded by wildfires in Alberta, the economy rebounded modestly in the second half of the year as oil and gas production normalized and non-energy exports recovered from earlier weakness. The U.S. economy also continued to show moderate growth. Consumer spending growth was strong over the first half of the year, however, declining inventory investment and a reduction in business investment had an adverse impact on growth earlier in the year. Global equity markets have recorded minimal gains this year amid several periods of heightened volatility related to global growth concerns and political uncertainly related to Brexit and the recent U.S. election.

RBC delivered solid results in 2016 driven by strong earnings in Wealth Management, which benefited from the inclusion of City National, solid results in Personal & Commercial Banking, and record earnings in Investor & Treasury Services. In addition to closing the acquisition of City National in fiscal 2016, RBC also completed the sale of RBC General Insurance Company, our home and auto insurance manufacturing business, to Aviva Canada Inc., which included a 15 year strategic agreement between RBC Insurance and Aviva.

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 may enforce them. Significant developments include continuing changes to global and domestic standards for capital and liquidity, over-the-counter (OTC) derivatives reform, initiatives to enhance requirements for institutions deemed systemically important to the financial sector, and changes to resolution regimes addressing government bail-in and total loss-absorbing capacity. We also continue to implement reforms enacted under the U.S. *Dodd-Frank Wall Street Reform and Consumer Protection Act* (the Dodd-Frank Act) including those related to the Federal Reserve's enhanced prudential standards for Bank Holding Companies and Foreign Banking Organizations.

Our acquisitions and dispositions that have influenced the general development of our business over the past three years are summarized in the following table:

Business Segment	**Acquisition/Disposition**	**Key Characteristics**
Insurance	RBC General Insurance Company (2016)	• Disposition of our home and auto insurance manufacturing business which included a 15 year strategic distribution agreement allowing RBC Insurance to market and sell a full suite of property and casualty insurance products to Canadians.
Wealth Management	City National Corporation (2015) (closed November 2, 2015)	• Acquisition enhances our U.S. presence and strategically compliments our U.S. Wealth Management and Capital Markets businesses creating a platform for long term growth.
	Royal Bank of Canada (Suisse) SA (2015)	• Disposition supports our long-term growth strategy to build a focused global wealth management business servicing clients from our hubs in North America, the British Isles and Asia.
Personal & Commercial Banking	RBC Royal Bank (Suriname) N.V. (2015) RBC Royal Bank (Jamaica) Limited and RBTT Securities Jamaica Limited (2014)	• Disposition of these businesses was in support of the repositioning of our Caribbean business.

Additional information about our three year history can also be found in the “Overview and outlook” section beginning on page 9 of our 2016 Management’s Discussion and Analysis, which section is incorporated by reference herein.

DESCRIPTION OF THE BUSINESS

General Summary

We are Canada’s largest bank, and one of the largest banks in the world, based on market capitalization. We are one of North America’s leading diversified financial services companies, and provide personal and commercial banking, wealth management, insurance, investor services and capital markets products and services on a global basis. We have over 80,000 full- and part-time employees who serve more than 16 million personal, business, public sector and institutional clients through offices in Canada, the U.S. and 36 other countries.

Our reporting segments are Personal & Commercial Banking, Wealth Management, Insurance, Investor & Treasury Services, Capital Markets and Corporate Support. Additional information about our business and each segment (including segment results) can be found under “Overview and outlook” beginning on page 9 and under “Business segment results” beginning on page 19 of our 2016 Management’s Discussion and Analysis, which sections are incorporated by reference herein.

Seasonality

Information about seasonality is provided under “Quarterly financial information” beginning on page 41 of our 2016 Management’s Discussion and Analysis, which section is incorporated by reference herein.

Competition

Our competition includes the other Canadian Schedule I banks, and, as we expand into new lines of business, our competition has grown to include other Canadian banks, trust companies, foreign banks, credit unions, caisses populaires, auto financing companies, investment management companies serving retail and corporate customers and public institutions and companies that offer products and services traditionally offered by financial institutions, investment counselling firms, brokerages, investment dealers, self-directed brokers, mutual fund companies, global private banks, wealth managers, asset managers, traditional offshore private banks, U.S. investment-led private client operations, custody service providers, insurance companies, reinsurance companies, investment banks, virtual banks and specialty financial service providers. Key competitive factors include the range and features of financial products and services offered, pricing, distribution, and service quality. Additional information about our competition can be found under “Business segment results” beginning on page 19 of our 2016 Management’s Discussion and Analysis, which section is incorporated by reference herein.

Government Regulation and Supervision – Canada

The Bank is a “Schedule I” bank under the *Bank Act* (Canada) (Bank Act), and, as such, is a federally regulated financial institution. Its Canadian trust, loan and insurance subsidiaries are also federally regulated financial institutions governed by (respectively) the *Trust and Loan Companies Act* (Canada) and the *Insurance Companies Act* (Canada). The activities of the Bank’s Canadian trust, loan and insurance subsidiaries are also regulated under provincial and territorial laws in respect of their activities in the provinces and territories. In certain provinces, some of the Bank’s capital markets activities are regulated under provincial securities laws (which are administered and enforced by securities regulatory authorities).

The Office of the Superintendent of Financial Institutions (OSFI), an independent agency of the Government of Canada, reports to the Minister of Finance (the Minister) for the supervision of the Bank, as well as its Canadian federally regulated trust, loan and insurance subsidiaries. OSFI is required, at least once a year, to examine the affairs and business of each institution for the purpose of determining whether statutory requirements are duly observed and the institution is in sound financial condition, and report to the Minister. The Bank and its Canadian trust, loan and insurance subsidiaries are also required to make periodic filings and reports to OSFI.

The Bank and its Canadian trust, loan and insurance subsidiaries are also subject to regulation under the *Financial Consumer Agency of Canada Act* (FCAC Act).[2] The Financial Consumer Agency of Canada (Agency), among other things, enforces consumer-related provisions of the federal statutes which govern these financial institutions. The Commissioner of the Agency must report to the Minister on all matters connected with the administration of the FCAC Act and consumer provisions of other federal statutes, including the Bank Act, *Trust and Loan Companies Act* and *Insurance Companies Act*. The Bank and its Canadian trust and loan subsidiaries are also subject to provincial and territorial laws of general application.

The Bank and its subsidiaries, Royal Trust Corporation of Canada, The Royal Trust Company, Royal Bank Mortgage Corporation and RBC Investor Services Trust are member institutions of the Canada Deposit Insurance Corporation (CDIC). CDIC insures certain deposits held at the member institutions.

Under the Bank Act, the Bank is prohibited from engaging in or carrying on any business other than the business of banking, except as permitted. The Bank can provide, amongst other services, any financial services, investment counselling services and portfolio management services, act as a financial agent and issue and operate payment, credit or charge card plans.

The Bank has broad powers to invest in securities, but is limited in making “substantial investments” or in controlling certain types of entities. A “substantial investment” will arise through direct or indirect beneficial ownership of voting shares carrying more than 10 per cent of the voting rights attached to all outstanding voting shares of a corporation, shares representing more than 25 per cent of the shareholders’ equity in a corporation, or interests representing more than 25 per cent of the ownership interests in any unincorporated entity.

The Bank can, however, make controlling, and in certain circumstances, non-controlling substantial investments in Canadian banks, trust or loan companies, insurance companies, cooperative credit societies and entities primarily engaged in dealing in securities; in foreign regulated entities which are primarily engaged outside Canada in a business that if carried on in Canada would be the business of banking, the business of a cooperative credit society, the business of insurance, the business of providing fiduciary services or the business of dealing in securities; and in factoring, finance, financial leasing, specialized financing and financial holding entities. Certain substantial investments may be made only with the prior approval of the Minister or the Superintendent of Financial Institutions (the Superintendent).

The Bank and its Canadian trust, loan and insurance subsidiaries are also required to maintain, in relation to operations, adequate capital and liquidity and OSFI may direct financial institutions to increase capital and/or to provide additional liquidity.

The *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* (the Act) is applicable to all of our businesses in Canada. The Act implements specific measures designed to detect and deter money laundering and the financing of terrorist activities. Further, the Act sets out obligations related to deterring and detecting money laundering and terrorist financing from a global perspective, in order to minimize the possibility that RBC could become a party to these activities. RBC has enterprise-wide anti-money laundering policies and procedures which assist in reducing the risk of facilitating money laundering and terrorist financing activities.

[2] For the Bank’s trust subsidiaries, only their retail deposit taking activities are subject to regulation under the FCAC Act.

Broker-Dealer/Investment Management Subsidiaries

The activities of certain of the Bank's subsidiaries, such as RBC Dominion Securities Inc. (RBC DS), RBC Direct Investing Inc. (RBC DI), Royal Mutual Funds Inc. (RMFI), RBC Global Asset Management Inc., Phillips, Hager & North Investment Funds Ltd. (PH&N IF), and RBC Phillips, Hager & North Investment Counsel Inc., which act as securities dealers (including investment dealers, mutual fund dealers and exempt market dealers), advisors (investment counsel/portfolio manager) or investment fund managers are regulated in Canada under provincial and territorial securities laws (which are administered and enforced by securities regulatory authorities) and, in some cases, by the rules of the applicable self-regulatory organization (the Investment Industry Regulatory Organization of Canada for investment dealers and the Mutual Fund Dealers Association of Canada (MFDA) for mutual fund dealers). Each of RBC DS and RBC DI are members of the Canadian Investor Protection Fund. Customers' accounts are protected by the Canadian Investor Protection Fund within specified limits. A brochure describing the nature and limits of coverage is available to customers upon request. RMFI and PH&N IF are each members of the MFDA Investor Protection Fund, which protects against certain losses of customer property held by an insolvent MFDA member; similarly, a brochure describing the nature and limits of coverage is also available to customers upon request.

Insurance

The activities of the Bank's regulated Canadian insurance subsidiaries, RBC Life Insurance Company (RBC Life) and RBC Insurance Company of Canada (RICC), are federally governed by the *Insurance Companies Act* and by provincial legislation in each province and territory in which they carry on business. In addition, the Bank is federally governed by the Bank Act for any insurance activities it is permitted to carry out. The Bank may administer, promote and provide advice in relation to certain authorized types of insurance and may conduct any aspect of the business of insurance, other than the underwriting of insurance, outside of Canada and in respect of risks outside Canada. However, in Canada, the Bank may not act as agent for any person in the placing of insurance. The Bank can promote an insurance company, agent or broker or non-authorized types of insurance (e.g. life and home and automobile insurance) to certain prescribed groups where the promotion takes place outside of physical bank branches. Additionally, and subject to applicable restrictions under the Bank Act, RBC Wealth Management Financial Services Inc., a wholly owned indirect subsidiary of the Bank, is licensed under applicable provincial and territorial laws to sell insurance products, including life and benefits insurance along with money products such as annuities and segregated funds, on both an individual and group basis, for both related and independent insurance companies in Canada.

RBC Life is a member of Assuris which is a not-for-profit organization that protects Canadian life insurance policyholders against loss of benefits due to the financial failure of a member company. RICC is a member of the Property and Casualty Insurance Compensation Corporation which is the corporation protecting Canadian property and casualty policyholders against loss of benefits due to the financial failure of a member company.

RBC Insurance Agency Ltd. is a licensed insurance agency that distributes insurance products underwritten by non-RBC entities. These products include home and auto insurance that is underwritten by an unaffiliated insurance company.

Government Regulation and Supervision – United States

Banking

In the U.S., the Bank is characterized as a foreign banking organization (FBO). Generally, the operations of an FBO and its U.S. subsidiaries and offices are subject to the same comprehensive regulatory regime that governs the operations of U.S. domestic banking organizations. The Bank's U.S. businesses are subject to supervision and oversight by various U.S. authorities, including federal and state regulators, as well as self-regulatory organizations.

In 2000, the Bank became a U.S. “financial holding company” (FHC), as authorized by the Board of Governors of the Federal Reserve System (Federal Reserve). On November 2, 2015, RBC USA Holdco, Inc. (USA Holdco), RBC’s top tier U.S. holding company, became a bank holding company (BHC) and an FHC. Pursuant to the *Gramm-Leach-Bliley Act*, an FHC may engage in, or acquire companies engaged in, a broader range of financial and related activities than are permitted to banking organizations that do not maintain FHC status. To qualify as an FHC, the Bank, as a FBO and BHC, and USA Holdco, as a BHC, must meet certain capital requirements and must be deemed to be “well managed” for U.S. bank regulatory purposes. In addition, any U.S. depository institution subsidiaries of the FBO or BHC must also meet certain capital requirements and be deemed to be “well managed” and must have at least a “satisfactory” rating under the *Community Reinvestment Act of 1977*.

An FBO must meet several conditions in order to maintain “well managed” status for U.S. bank regulatory purposes: (i) the FBO must have received a composite regulatory rating of “satisfactory” or better for its U.S. branch, agency and commercial lending company operations following its last regulatory examination, (ii) the FBO’s home country supervisor must consent to it expanding its activities in the U.S. to include activities permissible for an FHC, (iii) the FBO’s management must meet standards comparable to those required for a U.S. bank subsidiary of an FHC, and (iv) each U.S. depository institution subsidiary of the FBO and/or BHC must be deemed to be “well managed”, which requires both a “satisfactory” composite regulatory rating and a “satisfactory” rating on the “management” component of their last regulatory examination.

Under the *International Banking Act of 1978* (IBA) and the *Bank Holding Company Act of 1956* (BHCA), all of the Bank’s U.S. banking operations are subject to supervision and regulation by the Federal Reserve. Under the IBA, the BHCA, and related regulations of the Federal Reserve, the Bank generally may not open a branch, agency or representative office in the U.S., nor acquire five per cent or more of the voting stock of any U.S. bank or bank holding company, without notice to or prior approval of the Federal Reserve.

The Federal Reserve is the U.S. “umbrella regulator” responsible for regulatory oversight of the whole of the Bank’s U.S. activities. The Federal Reserve consults with and obtains information from other functional U.S. regulators that exercise supervisory authority over the Bank’s various U.S. operations. Reports of financial condition and other information relevant to the Bank’s U.S. businesses are regularly filed with the Federal Reserve.

On July 21, 2010, the Dodd-Frank Act was enacted. The statute requires significant changes to U.S. financial regulations, with material cross-border implications. Some provisions of the Dodd-Frank Act have taken effect automatically. Other provisions require adoption of rules by one or more U.S. regulatory authorities to become operative and such rules are in various stages of completion.

Under the Dodd-Frank Act, the Bank is registered as a “Swap Dealer” with the U.S. Commodity Futures Trading Commission (CFTC) and the National Futures Association (NFA).

Regulation YY of the Federal Reserve issued under the Dodd-Frank Act (the Enhanced Prudential Standards) required the Bank to establish, by July 1, 2016, an intermediate holding company (IHC) organized under the laws of the United States, to hold directly or indirectly the Bank’s entire ownership interest in its U.S. insured depositary institution (IDI) subsidiaries and U.S. subsidiaries holding at least 90 % of its U.S. non-branch assets not owned by its IDI subsidiaries (excluding so called section 2(h)(2) companies and Debt Previously Contracted branch subsidiaries) with the entire ownership interest in all such subsidiaries to be held through the IHC by July 1, 2017. The Bank designated USA Holdco as its IHC. The Bank as an FBO and USA Holdco as an IHC are subject to Subpart O of the Enhanced Prudential Standards, which includes capital adequacy, capital planning and stress testing, risk management and governance, liquidity and liquidity stress testing, financial regulatory reporting and other requirements that are similar to or the same as those applicable to large U.S. domestic bank holding companies.

For further information on certain developments relating to the Dodd-Frank Act, see the “Risk management” section beginning on page 46 of our 2016 Management’s Discussion and Analysis, which section is incorporated by reference herein.

The Bank maintains three branches in New York which are licensed and supervised as federal branches by the Office of the Comptroller of the Currency (OCC), the U.S. supervisor of national banks. In general, the Bank’s branches may exercise the same rights and privileges, and are subject to the same restrictions, as would apply to a U.S. national bank at the same location(s). The Bank’s branches may accept wholesale deposits but may not take U.S. domestic retail deposits outside of an available exemption. Deposits in the Bank’s branches are not insured by the Federal Deposit Insurance Corporation (FDIC). The Bank has obtained approval to maintain a limited federal branch in Jersey City, New Jersey which may exercise the same rights and privileges as the Bank’s federal branches.

The OCC examines and supervises the Bank’s U.S. branch office activities and annually examines and assesses their operations. In addition, the Bank’s U.S. branches are required to maintain certain liquid assets on deposit in their state(s) of residence, which deposits are pledged to the OCC. Furthermore, the Bank is subject to supervisory guidance based on the examiners’ assessment of risk management, operational controls, compliance and asset quality.

The Bank also maintains a state-licensed agency in Texas and state-licensed representative offices in California, Delaware, Texas and Washington (where it is called an alien bureau). In general, the activities conducted at the Bank’s agencies include a broad range of banking powers, including lending and maintaining credit balances, but agencies are limited in their ability to accept deposits from citizens or residents of the U.S. Further limitations may be placed on such agencies activities based on state laws. The activities conducted at the Bank’s representative offices are limited to representational and administrative functions; such representative offices do not have authority to make credit decisions and may not solicit or contract for any deposit or deposit-like liability. The Bank’s representative offices are examined and assessed by both the Federal Reserve and state regulators and are required to adhere to any applicable state regulations.

Banking activities are also conducted at City National Bank (CNB) and RBC Bank (Georgia), National Association (RBC Bank), both of which are national banking associations chartered by the OCC. CNB and RBC Bank are members of the Federal Reserve System. The primary federal regulator of CNB and RBC Bank is the OCC. As U.S. banks, CNB and RBC Bank are allowed to take retail deposits, and they offer retail and commercial banking services, including deposit and credit services, such as consumer lending products (including credit card and mortgage loans), and business and commercial loans. CNB and RBC Bank are subject to capital requirements, dividend restrictions, limitations on investments and subsidiaries, limitations on transactions with affiliates (including the Bank and its branches), deposit reserve requirements and other requirements administered by the OCC and the Federal Reserve. Deposits at CNB and RBC Bank are FDIC-insured to the extent permissible. As a national bank in the U.S., CNB also has fiduciary powers and exercises investment management under those powers.

Trust company activities are conducted at RBC Trust Company (Delaware) Limited (RBC Trust), the Bank’s U.S. trust company subsidiary. RBC Trust is a Delaware trust company chartered and supervised by the Delaware State Banking Commission and, as a subsidiary of a bank holding company, is subject to oversight by the Federal Reserve. RBC Trust is subject to dividend restrictions, limitations on investments and other applicable state banking law requirements.

The *USA PATRIOT Act*, which amended the *Bank Secrecy Act*, requires U.S. banks and foreign banks with U.S. operations to maintain appropriate policies, procedures and controls relating to anti-money laundering compliance, suspicious activity and currency transaction reporting and due diligence on customers to prevent, detect and report individuals and entities involved in money laundering and the financing of terrorism.

Broker-Dealer Activities and Broker-Dealer Subsidiaries

The principal securities brokerage, trading, advisory and investment banking activities are conducted in the following U.S.-registered broker-dealer subsidiaries:

- RBC Capital Markets, LLC (RBC CM LLC),
- RBC Capital Markets Arbitrage S.A. (RBC CMA),
- City National Securities, Inc.,
- RIM Securities LLC, and
- Symphonic Securities LLC.

The SEC, state securities regulators, the Financial Industry Regulatory Authority and other self-regulatory organizations regulate these broker-dealer subsidiaries. Certain activities of RBC CM LLC and RBC CMA are also subject to regulation by the CFTC and the NFA. Pursuant to the Dodd-Frank Act, RBC CM LLC is registered as a "Swaps Firm" with the NFA. Certain activities of RBC CM LLC are subject to regulation by the Municipal Securities Rulemaking Board.

Investment Management and Other Fiduciary Activities

The Bank's New York branches have fiduciary powers, and certain branches conduct investment management and custody activities for certain customers. In addition, other affiliates are involved in the business of investment management. In many cases, these activities require that the affiliates be registered with the SEC as investment advisers under the U.S. *Investment Advisers Act of 1940* (Advisers Act). The Advisers Act and related rules regulate the registration and activities of investment advisers. Although the regulatory regime for investment advisers is similar to that for broker-dealers, the standard of conduct is higher due to the advisers' status as fiduciaries. This status as a fiduciary limits the investment adviser's ability to make use of affiliates and requires that it avoid or manage and disclose conflicts of interests with respect to the conduct of its business.

The following entities are the Bank's subsidiaries that are registered as "investment advisers" with the SEC:

- RBC CM LLC,
- RBC Alternative Asset Management Inc.,
- RBC Global Asset Management (U.S.) Inc. (GAM),
- RBC Global Asset Management (UK) Limited,
- Royal Bank of Canada Investment Management (USA) Limited,
- RBC Private Counsel (USA) Inc.,
- BlueBay Asset Management LLP,
- BlueBay Asset Management USA LLC,
- City National Rochdale,
- City National Securities, Inc.,
- Convergent Wealth Advisors, LLC,
- LMCG Investments, LLC,
- Mid-Continent Capital LLC, and
- Symphonic Financial Advisors LLC.

GAM is also the advisor to several U.S. mutual funds sponsored by it. The U.S. *Investment Company Act of 1940* and related rules regulate the registration and operation of mutual funds and the activities of the funds' advisers and other affiliates, and certain of the funds' other service providers.

ERISA and the Internal Revenue Code

The U.S. *Employee Retirement Income Security Act of 1974* , as amended (ERISA), and the related rules regulate the activities of the financial services industry with respect to pension plan clients. Similarly, the U.S. *Internal Revenue Code* and the regulations thereunder impose requirements with respect to such clients and also individual retirement accounts (IRAs). Brokers, dealers and investment advisers to pension plans and IRAs must conduct their business in compliance with both ERISA and applicable tax regulations.

Risk Factors

A discussion of risks affecting us and our businesses appears under the headings “Risk management” and “Overview of other risks” beginning on pages 46 and 87, respectively, of our 2016 Management’s Discussion and Analysis for the year ended October 31, 2016, which discussions are incorporated by reference herein.

Environmental Policies

Our first corporate environmental policy was developed in 1991 and since then we have been committed to environmental management and continuous improvement. In 2014, we published the second iteration of the RBC Environmental Blueprint that articulates our policy, priorities, objectives and targets relating to environmental sustainability through 2018. It also establishes our approach to environmental matters pertaining to operations, business activities, products and services, employees, governance, compliance, reporting transparency and partnerships.

Underpinning the RBC Environmental Blueprint is our Enterprise-wide Environmental & Social Risk Management Policy, which applies to all of our business activities globally. The purpose of the policy is to ensure that the impact of environmental and social factors is considered in all RBC activities. The Enterprise-wide Environmental & Social Risk Management Policy is complemented by a suite of risk management policies that mandate enhanced due diligence on transactions and business activities where environmental and social issues may give rise to credit, legal or reputational risk. We regularly update these policies and procedures to address regulatory changes, emerging and evolving issues, and international best practices. Environmental and social risk management policies have been established for:

- Residential mortgage lending in Canada,
- Small business and commercial loans and mortgages for Canada, the U.S. and the Caribbean,
- Agriculture lending in Canada,
- Corporate lending and investment banking globally,
- Project financing (in accordance with the Equator Principles) globally,
- Public sector lending in Canada, and
- Environmental investigations (use of third-party consultants) in Canada and the U.S.

We also have the RBC Supplier Code of Conduct and an enterprise-wide supplier management policy that includes requirements that we gather the appropriate environmental and social information regarding prospective suppliers and the products and services they offer, and incorporate that information in procurement decisions.

Additional information about our environmental policies and environmental risks can be found under “Overview of other risks – Environmental risk” beginning on page 88 of our 2016 Management’s Discussion and Analysis, which section is incorporated by reference herein.

DESCRIPTION OF CAPITAL STRUCTURE

General Description

The Bank's authorized share capital consists of an unlimited number of common shares without nominal or par value and an unlimited number of first preferred shares and second preferred shares without nominal or par value, issuable in series, which classes may be issued for a maximum consideration of $20 billion and $5 billion, respectively. The following summary of share capital is qualified in its entirety by the Bank's by-laws and the actual terms and conditions of such shares.

Common Shares

The holders of the Bank's common shares are entitled to vote at all meetings of shareholders, except meetings at which only holders of a specified class, other than common shares, or series of shares are entitled to vote. The holders of common shares are entitled to receive dividends as and when declared by the board of directors, subject to the preference of the preferred shares. After payment to the holders of the preferred shares of the amount or amounts to which they may be entitled, and after payment of all outstanding debts, the holders of the common shares will be entitled to receive any remaining property upon liquidation, dissolution or winding-up.

Preferred Shares

First preferred shares may be issued, from time to time, in one or more series with such rights, privileges, restrictions and conditions as the board of directors may determine, subject to the Bank Act and to the Bank's by-laws. Currently, Non-Cumulative First Preferred Shares Series W, AA, AB, AC, AD, AE, AF, AG, AJ, AK, AL, AZ, BB, BD, BF, BH, BI, BJ, C-1, C-2, BK and BM are outstanding.

The Non-Cumulative First Preferred Shares Series W are, subject to the consent of the Superintendent, the requirements of the Bank Act and the approval of the Toronto Stock Exchange, redeemable or exchangeable by the Bank into common shares. The first preferred shares are entitled to preference over any second preferred shares (discussed below) and common shares and over any other shares ranking junior to the first preferred shares with respect to the payment of dividends and in the distribution of property in the event of liquidation, dissolution or winding-up.

Effective January 1, 2013, in accordance with capital adequacy requirements adopted by OSFI, non-common capital instruments issued after January 1, 2013, including first preferred shares, must include terms providing for the full and permanent conversion of such securities into common shares upon the occurrence of certain trigger events relating to financial viability (the Non-Viability Contingent Capital or NVCC requirements) in order to qualify as regulatory capital. As of January 1, 2013, all outstanding capital instruments that do not meet the NVCC requirements will be considered non-qualifying capital instruments and will be phased out beginning January 1, 2013 at the rate of 10 per cent each year for 10 years. The Non-Cumulative First Preferred Shares Series AZ, BB, BD, BF, BH, BI, BJ, BK and BM contain non-viability contingent capital provisions necessary for the shares to qualify as Tier 1 regulatory capital under Basel III and are therefore convertible into common shares upon the occurrence of a non-viability contingent capital trigger event.

We are prohibited by the Bank Act from declaring any dividends on our preferred or common shares when we are, or would be placed as a result of the declaration, in contravention of the capital adequacy and liquidity regulations or any regulatory directives issued under the Bank Act. We may not pay dividends on our common shares or redeem, purchase or otherwise retire common shares or preferred shares at any time without the approval of the holders of outstanding First Preferred Shares unless all dividends to which First Preferred Shareholders are then entitled have been declared and paid or set apart for payment.

On November 2, 2015, in connection with the merger of City National with and into USA Holdco, the Bank issued Non-Cumulative First Preferred Shares Series C-1 and C-2 (the Series C Preferred Shares) in exchange for two series of outstanding City National preferred stock.

In the event the Bank fails to pay, declare, or set aside for payment, dividends on any of the Series C Preferred Shares or any other series of preferred shares of the Bank for six quarterly dividend periods, or their equivalent, whether or not consecutive, the number of directors of the board of directors shall be increased by two at the Bank's first annual meeting of shareholders held thereafter. The holders of the Series C Preferred Shares shall have the right, together with holders of any shares that, by their terms, expressly provide that they rank *pari passu* with the Series C Preferred Shares (the Series C Parity Shares) and that have similar voting rights, if any, to elect, as a class together, such additional two members to the Bank's board of directors for a term of one year. Upon the payment, or the declaration and setting aside for payment, in full, of all the cumulative dividends payable for all past dividend periods and continuous noncumulative dividends for at least one year on all outstanding preferred shares of the Bank, the terms of such two directors shall terminate and the number of directors of the Bank's board of directors shall be reduced by two and the voting rights of the holders of the Series C Preferred Shares and the Series C Parity Shares shall cease (subject to the revesting of such voting right in the event of each and every additional failure in the payment of dividends for six quarterly dividend periods).

Second preferred shares may be issued, from time to time, in one or more series with such rights, privileges, restrictions and conditions as the board of directors may determine, subject to the Bank Act and to the Bank's by-laws. There are no second preferred shares currently outstanding. Second preferred shares would rank junior to the first preferred shares. Second preferred shares would be entitled to preference over the common shares and over any other shares ranking junior to the second preferred shares with respect to the payment of dividends and in the distribution of property in the event of our liquidation, dissolution or winding-up.

Except as outlined above with respect to the Series C Preferred Shares and the Series C Parity Shares, holders of the first and second preferred shares are not entitled to any voting rights as a class except as provided under the Bank Act or the Bank's by-laws. Under the Bank Act, the Bank may not create any other class of shares ranking equal with or superior to a particular class of preferred shares, increase the authorized number of, or amend the rights, privileges, restrictions or conditions attaching to such class of preferred shares, without the approval of the holders of that class of preferred shares.

Any approval to be given by the holders of the first and second preferred shares may be given in writing by the holders of not less than all of the outstanding preferred shares of each class or by a resolution carried by the affirmative vote of not less than 66 2/3 per cent of the votes cast at a meeting of holders of each class of preferred shares at which a quorum is represented. A quorum at any meeting of holders of each class of preferred shares is 51 per cent of the shares entitled to vote at such meeting, except that at an adjourned meeting there is no quorum requirement.

Additional information about the Bank's share capital can be found under the "Capital management" section beginning on page 89 of our 2016 Management's Discussion and Analysis, which section is incorporated by reference herein.

Prior Sales

For information about the Bank's issuances of subordinated debentures since October 31, 2015, see the "Capital management" section beginning on page 89 of our 2016 Management's Discussion and Analysis and "Subordinated debentures" in Note 19 on pages 181 and 182 of our 2016 Annual Consolidated Financial Statements for the year ended October 31, 2016, which section and note are incorporated by reference herein.

Constraints

The Bank Act contains restrictions (which are subject to any orders that may be issued by the Governor in Council) on the issue, transfer, acquisition, beneficial ownership and voting of all shares of a chartered bank. The following is a summary of such restrictions.

Subject to certain exceptions contained in the Bank Act, no person may be a major shareholder of a bank having equity of $12 billion or more (which includes the Bank). A person is a major shareholder if:

(a) the aggregate of the shares of any class of voting shares of the Bank beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person is more than 20 per cent of that class of voting shares, or

(b) the aggregate of shares of any class of non-voting shares of the Bank beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person is more than 30 per cent of that class of non-voting shares.

Additionally, no person may have a significant interest in any class of shares of a bank (including the Bank) unless the person first receives the approval of the Minister of Finance. For purposes of the Bank Act, a person has a significant interest in a class of shares of a bank where the aggregate of any shares of the class beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person exceeds 10 per cent of all of the outstanding shares of that class of shares of such bank.

In addition, the Bank Act prohibits a bank from purchasing or redeeming any of its shares or paying any dividends if there are reasonable grounds for believing the bank is, or the payment would cause the bank to be, in contravention of the Bank Act requirement to maintain, in relation to its operations, adequate capital and appropriate forms of liquidity and to comply with any regulations or directions of the Superintendent in relation thereto. Under the Bank Act, the Bank cannot redeem or purchase any shares for cancellation unless the prior consent of the Superintendent has been obtained.

Subject to any orders that may be issued by the Governor in Council, the Bank Act also prohibits the registration of a transfer or issue of any shares of a Canadian bank to any government or governmental agency of Canada or any province of Canada, or to any government of any foreign country, or any political subdivision, or agency of any foreign country.

Ratings

Our ability to access unsecured funding markets and to engage in certain collateralized business activities on a cost-effective basis is primarily dependent upon maintaining competitive credit ratings. Our credit ratings are largely determined by the rating agencies' assessment of the quality of our earnings, the adequacy of our capital and the effectiveness of our risk management programs. There can be no assurance that our credit ratings and rating outlooks will not be lowered or that ratings agencies will not issue adverse commentaries about us, potentially resulting in adverse consequences for our funding capacity or access to capital markets.

A lowering of our credit ratings may also affect our ability, and the cost, to enter into normal course derivative or hedging transactions and may require us to post additional collateral under certain contracts. However, we estimate, based on periodic reviews of ratings triggers embedded in our existing businesses and of our funding capacity sensitivity, that a minor downgrade would not materially influence our liability composition, funding access, collateral usage and associated costs.

As at November 29, 2016, the Bank received the following solicited ratings from the rating agencies listed below [3]:

		RATING	RANK*
Moody's Investors Service	Long-term Senior Debt	Aa3	4 of 22
	Short-term Debt	P-1	1 of 3
	Subordinated Debt	A3	7 of 22
	NVCC Subordinated Debt	Baa1	8 of 22
	Preferred Shares	Baa2	9 of 22
	NVCC Preferred Shares	Baa2	9 of 22
Standard & Poor's	Long-term Senior Debt	AA-	4 of 22
	Short-term Debt	A-1+	1 of 6
	Subordinated Debt	A	6 of 22
	NVCC Subordinated Debt	A-	7 of 22
	Preferred Shares	BBB+	6 of 22
	NVCC Preferred Shares	BBB	7 of 22
Fitch Ratings	Long-term Senior Debt	AA	3 of 23
	Short-term Debt	F1+	1 of 8
	Subordinated Debt	AA-	4 of 23
	NVCC Subordinated Debt	-	-
	Preferred Shares	-	-
	NVCC Preferred Shares	-	-
DBRS	Long-term Senior Debt	AA	3 of 26
	Short-term Debt	R-1 (high)	1 of 8
	Subordinated Debt	AA (low)	4 of 26
	NVCC Subordinated Debt	A (low)	7 of 26
	Preferred Shares	Pfd-2 (high)	4 of 16
	NVCC Preferred Shares	Pfd-2	5 of 16

* Relative rank of each rating within the organization's overall classification system.

A definition of the categories of each rating as at November 29, 2016 has been obtained from the respective rating agency's website and is outlined in Appendix B, and a more detailed explanation may be obtained from the applicable rating agency.

On June 6, 2016, S&P revised our outlook to negative from stable and affirmed our ratings.

On July 19, 2016, Moody's affirmed our ratings with a negative outlook.

On July 28, 2016, DBRS affirmed our ratings with a negative outlook.

On October 28, 2016, Fitch Ratings affirmed our ratings with a negative outlook.

Credit ratings, including stability or provisional ratings (collectively, Ratings) are not recommendations to purchase, sell or hold a security in as much as they do not comment on market price or suitability for a particular investor. Ratings may not reflect the potential impact of all risks on the value of securities. In addition, real or anticipated changes in the rating assigned to a security will generally affect the market value of that security. Ratings are subject to revision or withdrawal at any time by the rating organization. Each Rating listed in the chart above should be evaluated independently of any other Rating applicable to our debt and preferred shares. As is customary, RBC pays rating agencies to assign Ratings for the parent company as well as our subsidiaries, and for certain other services.

Additional information about Ratings is provided under "Risk management – Liquidity and funding risk – Credit ratings" on page 78 of our 2016 Management's Discussion and Analysis, which page is incorporated by reference herein.

[3] On August 17, 2016, Kroll Bond Rating Agency (Kroll), which is registered with the SEC as a nationally recognized statistical rating organization, affirmed the senior unsecured long-term debt and deposit ratings of AA (ranking 3 of 22) and the short-term rating of K1+ (ranking 1 of 7) for RBC. Kroll's outlook on all long-term ratings for RBC was revised to negative from stable on August 17, 2016. These ratings were unsolicited and RBC did not participate in the ratings process.

MARKET FOR SECURITIES

Trading Price and Volume

The Bank's common shares are listed on the Toronto Stock Exchange (TSX) in Canada, the New York Stock Exchange (NYSE) in the U.S. and the SIX Swiss Exchange (SIX) in Switzerland. Preferred shares, except the Bank's First Preferred Shares Series C-1 and C-2, are listed on the TSX. The Bank's Depositary Shares (representing interests in the Bank's First Preferred Shares Series C-1 and C-2) are listed on the NYSE.

The following table sets out the price range and trading volumes of the common shares on the TSX and the US Composite for the periods indicated. Prices are based on the reported amounts from the TSX Historical Data Access (TSX HDA) and NYSEConnect.

	Common Shares (TSX)			Common Shares (NYSE)		
Month	**High ($)**	**Low ($)**	**Volume**	**High (US$)**	**Low (US$)**	**Volume**
November 2015	77.18	73.68	45,247,007	58.45	55.24	28,312,891
December 2015	77.67	71.93	54,164,385	58.00	52.28	25,223,487
January 2016	73.58	64.95	72,592,857	52.80	44.37	35,207,195
February 2016	71.99	64.52	66,165,802	52.62	46.08	32,104,084
March 2016	76.25	69.06	59,253,549	58.81	51.18	29,652,130
April 2016	78.93	73.18	49,960,898	62.78	55.68	26,233,307
May 2016	80.97	74.91	48,513,237	62.39	58.02	22,700,156
June 2016	80.39	74.64	60,970,103	63.43	57.01	26,526,849
July 2016	80.85	75.83	38,383,910	62.26	58.21	20,848,690
August 2016	83.00	78.24	37,802,019	64.13	59.88	20,796,220
September 2016	82.17	79.75	39,919,998	63.57	60.50	18,173,131
October 2016	84.70	80.70	39,788,379	64.31	61.16	15,384,134

The following tables provide the price range and trading volumes of the First Preferred Shares on the TSX for the periods indicated. Prices are based on the reported amounts from the TSX HDA.

	Series W			Series AA		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	23.86	22.80	118,431	25.00	24.78	121,476
December 2015	23.04	21.62	314,296	25.00	24.19	140,574
January 2016	23.01	21.98	214,946	24.80	23.30	212,970
February 2016	23.49	22.66	117,195	24.48	23.54	143,900
March 2016	24.45	22.72	154,965	24.70	23.68	321,365
April 2016	24.77	23.89	207,383	24.95	24.49	156,915
May 2016	24.70	24.24	141,650	25.10	24.88	91,272
June 2016	24.94	24.40	95,826	25.10	24.77	267,492
July 2016	25.16	24.83	229,300	25.28	24.99	171,187
August 2016	25.33	25.00	125,874	25.52	25.18	193,143
September 2016	25.30	25.00	91,000	25.26	25.00	312,336
October 2016	25.44	25.07	92,552	25.32	25.00	210,445

	Series AB			Series AC			Series AD		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	25.05	24.80	553,816	25.01	24.80	150,637	24.99	24.80	124,052
December 2015	25.16	24.55	231,899	25.15	24.58	51,267	25.11	24.25	195,715
January 2016	25.08	22.84	180,654	25.10	23.84	184,258	25.12	23.77	104,209
February 2016	24.87	24.26	150,839	24.56	24.02	54,789	24.49	23.62	83,596
March 2016	25.12	24.52	187,744	25.00	24.19	35,407	24.96	23.89	184,359
April 2016	25.20	24.73	73,016	25.11	24.66	36,245	25.06	24.52	147,944
May 2016	25.30	25.00	77,811	25.25	24.92	101,025	25.10	24.90	87,407
June 2016	25.27	25.00	196,783	25.25	24.95	40,876	25.13	24.85	139,108
July 2016	25.40	25.14	87,156	25.41	25.11	56,242	25.31	25.02	109,874
August 2016	25.69	25.21	60,165	25.56	25.14	55,908	25.38	25.06	139,386
September 2016	25.42	25.10	66,549	25.44	25.17	39,076	25.32	25.09	106,146
October 2016	25.41	25.05	93,887	25.42	25.02	235,800	25.35	25.03	113,514

	Series AE			Series AF			Series AG		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	25.03	24.80	131,740	25.00	24.74	78,913	25.05	24.86	56,369
December 2015	24.99	24.31	107,917	24.98	24.22	256,684	25.10	24.40	91,466
January 2016	24.93	23.62	87,815	24.82	23.63	10,398	24.92	23.69	71,800
February 2016	24.47	23.63	94,676	24.42	23.45	96,456	24.47	25.50	97,619
March 2016	24.93	23.84	104,602	24.72	23.73	112,516	24.85	23.79	96,081
April 2016	25.04	24.55	155,947	24.95	24.45	182,454	25.02	24.31	145,531
May 2016	25.09	24.89	127,891	25.08	24.90	161,606	25.06	24.88	106,254
June 2016	25.13	24.90	120,153	25.14	24.86	75,847	25.14	24.86	108,333
July 2016	25.32	24.98	124,939	25.27	24.94	63,716	25.29	25.00	133,787
August 2016	25.39	25.06	167,593	25.34	25.02	84,178	25.35	25.05	77,790
September 2016	25.27	25.10	93,770	25.25	25.01	85,268	25.28	25.01	75,860
October 2016	25.36	25.01	425,310	25.37	25.01	88,111	25.33	25.03	106,517

	Series AJ			Series AK			Series AL		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	24.68	24.15	440,110	23.50	22.56	27,163	25.48	24.82	272,781
December 2015	24.94	22.50	398,049	23.50	21.32	61,469	25.69	23.85	272,286
January 2016	24.39	21.22	547,591	22.85	20.63	33,435	25.42	23.50	197,406
February 2016	24.19	22.25	136,325	22.99	21.66	43,860	24.98	24.41	110,037
March 2016	23.78	22.22	183,472	22.18	21.80	16,480	24.90	24.19	284,980
April 2016	24.25	23.10	141,397	22.42	21.86	7,689	25.20	24.41	147,626
May 2016	23.45	22.76	74,770	22.50	21.85	17,305	25.00	24.75	156,423
June 2016	23.67	22.45	124,521	22.55	21.49	133,685	25.19	24.77	111,211
July 2016	24.35	23.13	156,748	22.48	21.64	7,572	25.59	25.10	79,046
August 2016	24.68	24.10	137,050	23.17	22.50	20,760	25.68	25.05	132,404
September 2016	24.39	24.15	187,698	23.23	22.65	51,620	25.22	25.00	197,960
October 2016	25.00	24.15	597,485	23.52	22.69	14,391	25.83	25.12	676,996

	Series AZ			Series BB			Series BD		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	20.85	18.37	655,511	20.78	18.52	696,608	23.68	20.50	374,432
December 2016	19.85	16.99	945,471	19.95	17.08	716,958	20.89	17.90	1,109,513
January 2016	19.60	16.17	480,209	19.64	16.26	357,940	21.02	16.56	351,336
February 2016	17.69	16.00	347,534	17.65	16.08	466,922	19.18	16.86	438,437
March 2016	18.76	16.33	513,478	18.57	16.19	604,687	20.43	16.95	388,139
April 2016	19.68	18.45	489,696	19.62	18.37	475,748	20.50	19.49	546,309
May 2016	19.51	18.07	324,732	19.30	18.07	344,819	20.48	19.10	366,659
June 2016	18.91	17.60	626,030	18.91	17.75	445,972	20.00	18.26	319,825
July 2016	19.24	18.07	249,443	19.09	18.17	457,417	20.65	19.25	331,697
August 2016	19.75	19.04	637,177	19.59	18.90	436,857	21.45	20.56	481,234
September 2016	19.19	18.47	496,012	19.18	18.42	486,481	20.62	19.51	454,353
October 2016	19.65	18.75	514,792	19.37	18.66	635,202	21.42	20.17	579,092

	Series BF			Series BH			Series BI		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	22.84	20.25	188,917	23.95	23.00	85,667	23.81	23.07	114,148
December 2015	20.83	17.37	377,721	23.35	21.91	218,340	23.32	21.80	236,443
January 2016	20.26	16.01	299,710	22.90	21.79	151,916	22.93	21.75	245,212
February 2016	19.00	16.45	195,386	22.72	22.14	111,539	22.72	22.11	114,905
March 2016	20.74	16.76	173,355	23.60	22.27	125,960	23.62	22.39	149,759
April 2016	20.40	19.31	76,454	23.90	23.16	148,446	23.90	23.11	119,965
May 2016	20.30	18.85	108,681	24.45	23.59	65,123	24.43	23.54	91,156
June 2016	19.73	18.24	106,805	24.84	24.20	149,736	24.73	24.16	112,242
July 2016	20.26	19.11	217,876	25.16	24.55	91,499	25.16	24.59	253,949
August 2016	21.14	20.20	144,774	25.61	25.17	83,957	25.50	25.04	148,401
September 2016	20.31	19.25	212,647	25.50	25.10	53,750	25.47	25.06	101,480
October 2016	20.92	19.88	217,967	25.43	25.05	47,183	25.43	25.01	92,514

	Series BJ			Series BK			Series BM		
Month	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**	**High ($)**	**Low ($)**	**Volume**
November 2015	24.92	24.40	283,776	-	-	-	-	-	-
December 2015	24.91	24.14	254,275	25.89	24.95	2,725,545	-	-	-
January 2016	24.92	22.90	134,939	25.85	25.11	3,396,447	-	-	-
February 2016	24.59	23.81	68,981	25.77	25.08	2,502,115	-	-	-
March 2016	24.89	24.19	92,785	26.25	25.20	1,245,953	26.25	25.15	3,756,125
April 2016	25.18	24.70	158,153	26.63	25.90	1,578,635	26.44	25.99	1,511,168
May 2016	25.40	24.86	99,013	26.31	26.02	559,113	26.45	26.18	510,787
June 2016	25.87	25.30	62,047	26.65	25.86	822,546	26.81	26.19	640,438
July 2016	26.36	25.56	44,523	27.00	26.50	859,720	27.30	26.45	599,300
August 2016	26.49	26.15	79,786	27.09	26.30	608,796	27.16	26.50	710,252
September 2016	26.35	26.17	58,472	26.85	26.39	305,520	26.97	26.42	319,998
October 2016	26.32	25.77	78,084	26.94	26.57	1,129,100	27.03	26.57	792,866

The following table provides the price range and trading volumes of the Depositary Shares on the NYSE for the period indicated. Prices are based on the reported amounts from NYSEConnect.

	Series C-1			Series C-2		
Month	**High (US$)**	**Low (US$)**	**Volume**	**High (US$)**	**Low (US$)**	**Volume**
November 2015	25.62	24.15	614,984	30.00	28.07	31,402
December 2015	25.38	25.06	258,618	29.40	27.51	54,658
January 2016	27.00	25.25	899,573	30.35	28.12	215,732
February 2016	26.40	24.94	568,506	30.13	28.42	68,287
March 2016	25.64	24.96	131,964	30.40	28.20	22,818
April 2016	28.23	25.13	360,679	34.50	29.60	6,880
May 2016	26.25	25.26	115,349	31.43	27.80	15,902
June 2016	26.37	25.48	85,820	32.00	29.02	61,660
July 2016	26.24	25.34	170,087	33.50	29.34	32,273
August 2016	28.64	25.53	108,744	31.14	28.60	16,470
September 2016	26.98	25.92	45,708	30.30	28.53	3,934
October 2016	26.33	25.13	56,407	29.25	28.55	1,997

DIVIDENDS

The Bank has had an uninterrupted history of paying dividends on its common shares and on each of its outstanding series of first preferred shares. Information about the Bank's dividends paid or payable per share on the common shares and each outstanding series of first preferred shares in each of the three most recently completed years appears under the heading "Selected share data" in the Capital management section on page 96 of our 2016 Management's Discussion and Analysis for the year ended October 31, 2016, which section is incorporated by reference herein. Information about restrictions on the payment of dividends appears under the heading "Restrictions on the payment of dividends" in Note 21 on page 184 of our 2016 Annual Consolidated Financial Statements for the year ended October 31, 2016, which note is incorporated by reference herein.

The declaration amount and payment of future dividends will be subject to the discretion of the Bank's board of directors, and will be dependent upon the Bank's results of operations, financial condition, cash requirements and future regulatory restrictions on the payment of dividends and other factors deemed relevant by the board of directors. Information about our dividends and our dividend payout ratio (common share dividends as a percentage of net income less preferred share dividends) is provided under the "Capital management" section beginning on page 89 of our 2016 Management's Discussion and Analysis, which section is incorporated by reference herein.

DIRECTORS AND EXECUTIVE OFFICERS

Directors

The following are the Bank's directors as at November 29, 2016:

Name, and Year Elected	**Province/State and Country of Residence**	**Occupation**
W. Geoffrey Beattie (2001)	Ontario, CAN	Chief Executive Officer, Generation Capital
Andrew A. Chisholm (2016)	Ontario, CAN	Corporate Director

Name, and Year Elected	Province/State and Country of Residence	Occupation
Jacynthe Côté (2014)	Quebec, CAN	Corporate Director
Toos N. Daruvala (2015)	New York, U.S.A	Director Emeritus and Senior Advisor, McKinsey & Company
David F. Denison (2012)	Ontario, CAN	Corporate Director
Richard L. George (2012)	Alberta, CAN	Partner, Novo Investment Group
Alice D. Laberge (2005)	British Columbia, CAN	Corporate Director
Michael H. McCain (2005)	Ontario, CAN	President and Chief Executive Officer, Maple Leaf Foods Inc.
David I. McKay (2014)	Ontario, CAN	President and Chief Executive Officer, Royal Bank of Canada
Heather Munroe-Blum (2011)	Quebec, CAN	Professor of Medicine and Principal Emerita, McGill University
Thomas A. Renyi (2013)	Maine, U.S.A.	Corporate Director
Edward Sonshine (2008)	Ontario, CAN	Chief Executive Officer, RioCan Real Estate Investment Trust
Kathleen P. Taylor (2001)	Ontario, CAN	Chair of the Board, Royal Bank of Canada
Bridget A. van Kralingen (2011)	New York, U.S.A.	Senior Vice-President, IBM Industry Platforms, International Business Machines Corporation (IBM)
Thierry Vandal (2015)	New York, U.S.A.	President, Axium Infrastructure US Inc.

Directors are elected annually and hold office until the next annual meeting of shareholders. Since November 1, 2011, the directors have held the principal occupations described above, except for the following:

Mr. W. Geoffrey Beattie was President and Chief Executive Officer of The Woodbridge Company Limited prior to December 2012 and Deputy Chairman of the Thomson Reuters Corporation prior to May 2013.

Mr. Andrew A. Chisholm was an Advisory Director at Goldman Sachs & Co. prior to his retirement in April 2016, Senior Strategy Officer at Goldman Sachs & Co. prior to 2014 and Head of the Global Financial Institutions Group at Goldman Sachs & Co. prior to 2012.

Ms. Jacynthe Côté was President and Chief Executive Officer of Rio Tinto Alcan prior to September 2014.

Mr. Toos N. Daruvala was director and senior partner at McKinsey & Company prior to December 2015.

Mr. David F. Denison was President and Chief Executive Officer of the Canada Pension Plan Investment Board prior to July 2012.

Mr. Richard L. George was Chief Executive Officer of Suncor Energy Inc. prior to May 2012 and President and Chief Executive Officer of Suncor Energy Inc. prior to December 2011.

Mr. David I. McKay was President of Royal Bank of Canada prior to August 2014, Group Head, Personal & Commercial Banking of Royal Bank of Canada prior to March 2014 and Group Head, Canadian Banking of Royal Bank of Canada prior to 2012.

Dr. Heather Munroe-Blum was Principal and Vice-Chancellor of McGill University prior to June 2013.

Ms. Kathleen P. Taylor was President and Chief Executive Officer of Four Seasons Hotels and Resorts prior to January 2013.

Ms. Bridget A. van Kralingen was Senior Vice-President, IBM Global Business Services, IBM from January 2012 to August 2016 and General Manager of IBM North America from 2010 to January 2012.

Mr. Thierry Vandal was President and Chief Executive Officer of Hydro-Québec prior to May 2015.

Committees of the Board

Audit Committee: D.F. Denison (Chair), W.G. Beattie, A.A. Chisholm, J. Côté, A.D. Laberge, T.A. Renyi, E. Sonshine and T. Vandal.

Risk Committee: T.N. Daruvala (Chair), D.F. Denison, R.L. George, M.H. McCain, H. Munroe-Blum, T.A. Renyi and B.A. van Kralingen.

Governance Committee: H. Munroe-Blum (Chair), A.A. Chisholm, J. Côté, T.N. Daruvala, M.H. McCain and E. Sonshine.

Human Resources Committee: A.D. Laberge (Chair), W.G. Beattie, R.L. George, B.A. van Kralingen and T. Vandal.

Executive Officers

The following are the Bank's executive officers as at November 29, 2016:

Name	Province and Country of Residence	Title
Mike Dobbins	Ontario, CAN	Head, Strategy and Corporate Development
Janice R. Fukakusa[4]	Ontario, CAN	Chief Administrative Officer and Chief Financial Officer
Doug Guzman	Ontario, CAN	Group Head, Wealth Management and Insurance
Zabeen Hirji	Ontario, CAN	Chief Human Resources Officer
Mark Hughes	Ontario, CAN	Group Chief Risk Officer
A. Douglas McGregor	Ontario, CAN	Group Head, Capital Markets and Investor & Treasury Services

[4] On October 21, 2016 RBC announced Ms. Janice R. Fukakusa's intention to retire effective January 31, 2017. Rod Bolger will become Chief Financial Officer of Royal Bank of Canada as of December 1, 2016.

Name	Province and Country of Residence	Title
David I. McKay	Ontario, CAN	President and Chief Executive Officer
Bruce Ross	Ontario, CAN	Group Head, Technology and Operations
Jennifer Tory	Ontario, CAN	Group Head, Personal & Commercial Banking

Since November 1, 2011, the executive officers have held the positions described above, except for the following:

Mr. Mike Dobbins was appointed to Group Executive in his role as Head, Strategy and Corporate Development effective November 1, 2016. Prior to his current role, Mr. Dobbins was Executive Vice President, Personal Financing Products Canada & U.S. since 2010.

Mr. Doug Guzman was appointed to Group Executive in his role as Group Head, Wealth Management and Insurance effective November 1, 2015. Prior to his current role, Mr. Guzman was Managing Director and Head Global Investment Banking, Capital Markets since 2006.

Mr. Mark Hughes was appointed to Group Executive in his role as Chief Risk Officer of Royal Bank of Canada effective January 2014. Prior to his current role, Mr. Hughes was Executive Vice-President and Chief Operating Officer for RBC Capital Markets since November 2008.

Mr. A. Douglas McGregor was appointed to Group Executive in his role as Co-Group Head, Capital Markets in November 2008 and effective October 31, 2012 was appointed Co-Group Head, Capital Markets and Investor & Treasury Services. Mr. McGregor assumed full responsibilities for these businesses effective December 4, 2013.

Mr. David I. McKay was appointed President of Royal Bank of Canada effective in February 2014 and Chief Executive Officer effective in August 2014. Mr. McKay was appointed to Group Executive in his role as Group Head, Canadian Banking in April 2008 and effective October 31, 2012 was appointed Group Head, Personal & Commercial Banking.

Mr. Bruce Ross was appointed to Group Executive in his role as Group Head, Technology and Operations effective in January 2014. Prior to joining RBC, Mr. Ross was with IBM, holding a series of progressively more senior positions.

Ms. Jennifer Tory was appointed to Group Executive in her role as Group Head, Personal & Commercial Banking effective April 2014. Prior to her current role, Ms. Tory was Regional President, Greater Toronto Region since November 2005.

Ownership of Securities

To our knowledge, as at October 31, 2016, the directors and executive officers, as a group, beneficially own or exercise control or direction over less than one per cent (1%) of our common and preferred shares. None of our directors or executive officers holds shares of our subsidiaries except where required for qualification as a director of a subsidiary.

Cease Trade Orders, Bankruptcies, Penalties or Sanctions

To the best of our knowledge, no director or executive officer,

(a) is, as at November 29, 2016, or has been, within the 10 years before, a director, chief executive officer or chief financial officer of any company (including our company), that while that person was acting in that capacity,

(i) was the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under Canadian securities legislation[5], for a period of more than 30 consecutive days, or

(ii) was subject to an event that resulted, after the director or executive officer ceased to be a director, chief executive officer or chief financial officer, in the company being the subject of a cease trade or similar order or an order that denied the relevant company access to any exemption under Canadian securities legislation[5], for a period of more than 30 consecutive days, or

(b) is, as at November 29, 2016 or has been, within the 10 years before, a director or executive officer of any company (including our company), that while that person was acting in that capacity or within a year of that person ceasing to act in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold its assets, or

(c) has, within the 10 years before November 29, 2016, become bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or become subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of the director or executive officer,

Except for the following:

Mr. George is a director of Penn West Petroleum Ltd. (Penn West). On August 5, 2014, the Alberta Securities Commission issued a management cease trade order against the directors and certain officers of Penn West, which terminated on September 23, 2014. The management cease trade order was issued in connection with the restatement of certain of Penn West's financial statements and related management's discussion and analysis.

To the best of our knowledge, none of our directors or executive officers have been subject to (a) any penalties or sanctions imposed by a court relating to Canadian securities legislation[5] or by a Canadian securities regulatory authority [5] or has entered into a settlement agreement with a Canadian securities regulatory authority[5], or (b) any other penalties or sanctions imposed by a court or regulatory body that would likely be considered important to a reasonable investor in making an investment decision.

Conflicts of Interest

To the best of our knowledge, no director or executive officer has an existing or potential material conflict of interest with us or any of our subsidiaries.

[5] National Instrument 14-101 restricts the meaning of "securities legislation" to Canadian provincial and territorial legislation and "securities regulatory authority" to Canadian provincial and territorial securities regulatory authorities.

LEGAL PROCEEDINGS AND REGULATORY ACTIONS

In the ordinary course of our business, we are routinely involved in or parties to various ongoing, pending and threatened legal actions and proceedings.

A description of certain legal proceedings to which we are a party appears in Note 27 “Legal and regulatory matters” on pages 194 and 195 of our 2016 Annual Consolidated Financial Statements for the year ended October 31, 2016, which note is incorporated by reference.

Since October 31, 2015, (a) there have been no penalties or sanctions imposed against us by a court relating to Canadian securities legislation [6] or by a Canadian securities regulatory authority[6] which are individually or in the aggregate material to the Bank, (b) there have been no other penalties or sanctions imposed by a court or regulatory body against us that would likely be considered important to a reasonable investor in making an investment decision, and (c) we have not entered into any material settlement agreements with a court relating to Canadian securities legislation[6] or with a Canadian securities regulatory authority [6].

INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS

To the best of our knowledge, there were no directors or executive officers or any associate or affiliate of a director or executive officer with a material interest in any transaction within the three most recently completed financial years or during the current financial year that has materially affected us or is reasonably expected to materially affect us.

TRANSFER AGENT AND REGISTRAR

For Canada and the Caribbean, Computershare Trust Company of Canada is the transfer agent and registrar for our common shares and our preferred shares. Their principal offices are in the cities of: Montreal, QC; Toronto, ON; Calgary, AB and Vancouver, BC. In the U.S., Computershare Trust Company, N.A. is the co-transfer agent located in Canton, Massachusetts. In the U.K., Computershare Investor Services PLC is the co-transfer agent located in Bristol, England.

EXPERTS

PricewaterhouseCoopers LLP (PwC), Chartered Professional Accountants, prepared the Report of Independent Registered Public Accounting Firm in respect of our audited Annual Consolidated Financial Statements, which comprise the consolidated balance sheet as at October 31, 2016, and the consolidated statement of income, statement of comprehensive income, statement of changes in equity, and statement of cash flows for the year ended October 31, 2016, and a summary of significant accounting policies and other explanatory notes and the Report of Independent Registered Public Accounting Firm in respect of our internal control over financial reporting as at October 31, 2016. PwC has advised that they are independent with respect to the Bank within the meaning of the Rules of Professional Conduct of the Chartered Professional Accountants of Ontario and the rules of the U.S. Securities and Exchange Commission and the requirements of the Public Company Accounting Oversight Board.

[6] National Instrument 14-101 restricts the meaning of “securities legislation” to Canadian provincial and territorial legislation and “securities regulatory authority” to Canadian provincial and territorial securities regulatory authorities.

Deloitte LLP (Deloitte), Chartered Professional Accountants, prepared the Report of Independent Registered Public Accounting Firm in respect of our audited Annual Consolidated Financial Statements, which comprise the consolidated balance sheet as at October 31, 2015, and the consolidated statement of income, statement of comprehensive income, statement of changes in equity, and statement of cash flows for each of the years in the two-year period ended October 31, 2015, and a summary of significant accounting policies and other explanatory notes.

AUDIT COMMITTEE

Audit Committee Mandate

The mandate of the Audit Committee is attached as Appendix C to this Annual Information Form.

Composition of Audit Committee

The Audit Committee consists of David F. Denison (Chair), W. Geoffrey Beattie, Andrew A. Chisholm, Jacynthe Côté, Alice D. Laberge, Thomas A. Renyi, Edward Sonshine and Thierry Vandal. The board has determined that each member of the Audit Committee is independent under our Director Independence Policy, which incorporates the independence standards under applicable Canadian and U.S. laws and regulations and none receives, directly or indirectly, any compensation from us other than ordinary course compensation for service as a member of the board of directors and its committees or of a board of directors of one or more of our subsidiaries. All members of the Audit Committee are financially literate within the meaning of *National Instrument 52-110 – Audit Committees* and of the Corporate Governance Standards of the NYSE. In considering the criteria for determining financial literacy, the board of directors looks at the ability of a director to read and understand a balance sheet, an income statement and a cash flow statement of a financial institution. The board has determined that each of David F. Denison, W. Geoffrey Beattie, Jacynthe Côté, Alice D. Laberge, Thomas A. Renyi and Thierry Vandal qualifies as an “audit committee financial expert” as defined by the SEC.

Relevant Education and Experience of Audit Committee Members

In addition to each member’s general business experience, the education and experience of each Audit Committee member that is relevant to the performance of his or her responsibilities as an Audit Committee member is as follows:

W. Geoffrey Beattie, LL.B, earned his law degree from the University of Western Ontario. Mr. Beattie is Chief Executive Officer of General Capital (a private investment firm) and Chairman of Relay Ventures (a venture capital firm). He was Deputy Chairman of Thomson Reuters Corporation from 2000 to 2013 and was President and Chief Executive Officer of The Woodbridge Company Limited (an investment holding company) from 1998 to 2012. Mr. Beattie is also a director of Maple Leaf Foods Inc., General Electric Company, Acasta Enterprises Inc. and DBRS Ratings Limited. Mr. Beattie has been a member of our Audit Committee since April 2016.

Andrew A. Chisholm, B.Comm., M.B.A. earned his Bachelor of Commerce from Queen’s University and his M.B.A. from the University of Western Ontario. Mr. Chisholm served in various leadership capacities with Goldman Sachs & Company during his 31 years with the company. He also served as an Advisory Director of the firm from 2014 until his retirement in April 2016. Mr. Chisholm has been a member of our Audit Committee since July 2016.

Jacynthe Côté, B.Sc. earned her Bachelor of Science degree from Laval University. Ms. Côté was President and Chief Executive Officer of Rio Tinto Alcan from 2009 to 2014 and was President and Chief Executive Officer of Rio Tinto Alcan's Primary Metal business group, following Rio Tinto's acquisition of Alcan Inc. in October 2007. Ms. Côté has been a member of our Audit Committee since October 2014.

David F. Denison, O.C., B.Sc., B.Ed., FCPA, FCA, earned his bachelor degrees in mathematics and education from the University of Toronto and is a Chartered Professional Accountant, Chartered Accountant and a Fellow of CPA Ontario. Mr. Denison was President and Chief Executive Officer of the Canada Pension Plan Investment Board from 2005 to 2012 and is a director of Allison Transmission Holdings, Inc. and BCE Inc. and is also a director and Chair of the Board of Hydro One Limited. Mr. Denison has been a member of our Audit Committee since August 2012.

Alice D. Laberge, B.Sc., M.B.A., earned her Bachelor of Science degree from the University of Alberta and her M.B.A. from the University of British Columbia. Ms. Laberge was President and Chief Executive Officer of Fincentric Corporation until July 2005, and prior to December 2003, was its Chief Financial Officer. Ms. Laberge is a director of Potash Corporation of Saskatchewan Inc. and Russel Metals Inc. and has been a member of our Audit Committee since March 2006.

Thomas A. Renyi, B.A., M.B.A., earned his Bachelor of Arts in Business Administration and his M.B.A. from Rutgers University. Mr. Renyi served as Executive Chairman of The Bank of New York Mellon from 2007 until he retired in 2008. Prior to that, he was Chairman and Chief Executive Officer of The Bank of New York Company, Inc. and The Bank of New York for 10 years. Mr. Renyi serves as a director of The Hartford Financial Services Group Inc., and Public Service Enterprise Group. Mr. Renyi has been a member of our Audit Committee since February 2014.

Edward Sonshine, *Q.C., B.A., LL.B*, earned his law degree from Osgoode Hall Law School and a Bachelor of Arts degree from the University of Toronto. Mr. Sonshine is Chief Executive Officer and a director of RioCan Real Estate Investment Trust and also served as its President from 1994 to 2012. Mr. Sonshine also serves as a director of Cineplex Inc. Mr. Sonshine has been a member of our Audit Committee since February 2014.

Thierry Vandal, B.Eng., M.B.A., earned his engineering degree from École Polytechnique de Montréal and his M.B.A. from École des Hautes Études Commerciales Montréal. Mr. Vandal is President of Axium Infrastructure U.S. Inc., and from 2005 to May 2015 served as President and Chief Executive Officer of Hydro-Québec. Mr. Vandal is a director of Veresen Inc. Mr. Vandal has been a member of our Audit Committee since July 2015.

Pre-Approval Policies and Procedures

The Audit Committee has adopted a policy that requires pre-approval by the Audit Committee of audit services and other services within permissible categories of non-audit services. The policy prohibits us from engaging the auditor for "prohibited" categories of non-audit services. A copy of our Pre-Approval Policies and Procedures can be found in Appendix D.

Independent Registered Public Accounting Firm Fees

Following a tender process, PwC was appointed our auditor by the Board of Directors on January 29, 2016, which appointment was approved by the Bank's shareholders at the Annual and Special Meeting of Common Shareholders held on April 6, 2016. Fees relating to the year ended October 31, 2016 to PwC and its affiliates were $31.2 million and are detailed below. The nature of each category of fees is also described below.

	Year ended October 31, 2016 ($Millions)		
	Bank and Subsidiaries	**Mutual Funds[1]**	**Total**
Audit fees	$23.6	$1.7	**$25.3**
Audit-related fees	$ 4.6	$ -	**$ 4.6**
Tax fees	$ 0.1	$0.3	**$ 0.4**
All other fees	$ 0.5	$0.4	**$ 0.9**
Total fees	$28.8	$2.4	**$31.2**

[1] The Mutual Funds category includes fees paid for professional services provided by PwC for certain mutual funds managed by subsidiaries of the Bank. In addition to other administrative costs, the subsidiaries are responsible for the auditors' fees for professional services rendered in connection with the annual audit, statutory and regulatory filings and other services for the Mutual Funds in return for a fixed administration fee.

Prior to PwC's appointment, Deloitte was our auditor. Deloitte had become our sole auditor on September 23, 2003 and resigned on January 29, 2016. Deloitte or its predecessor firms had been involved in our audit since 1917 as one of a panel of auditors used by the Bank. Fees relating to the year ended October 31, 2015 to Deloitte and its affiliates were $31.4 million and are detailed below. The nature of each category of fees is also described below.

	Year ended October 31, 2015 ($Millions)		
	Bank and Subsidiaries	**Mutual Funds[1]**	**Total**
Audit fees	$22.6	$1.7	**$24.3**
Audit-related fees	$ 5.5	$ -	**$ 5.5**
Tax fees	$ 0.1	$0.3	**$ 0.4**
All other fees	$ 0.7	$0.5	**$ 1.2**
Total fees	$28.9	$2.5	**$31.4**

[1] The Mutual Funds category includes fees paid for professional services provided by Deloitte for certain mutual funds managed by subsidiaries of the Bank. In addition to other administrative costs, the subsidiaries are responsible for the auditors' fees for professional services rendered in connection with the annual audit, statutory and regulatory filings and other services for the Mutual Funds in return for a fixed administration fee.

Audit Fees

Audit fees were paid for professional services rendered by the auditor for the integrated audit of the Annual Consolidated Financial Statements of the Bank, including its audit of the effectiveness of our internal control over financial reporting, and any financial statement audits of our subsidiaries. In addition, audit fees were paid for services that generally only the Bank's independent auditor reasonably can provide including services provided in connection with statutory and regulatory filings related to prospectuses and other offering documents.

Audit-Related Fees

Audit-related fees were paid for assurance and related services that are reasonably related to the performance of the audit or review of our Annual Consolidated Financial Statements and are not reported under the audit fees item above. These services consisted of:

- special attest services traditionally performed by the Bank's independent auditor;
- reporting on the effectiveness of internal controls as required by contract or for business reasons;
- the audits of the financial statements of our various pension plans and charitable foundations;
- the audits of various trusts and limited partnerships; and
- the transition of the audit of the consolidated financial statements of the Bank and the audits of our subsidiaries to PwC.

Tax Fees

Tax fees were paid for tax compliance services including the review of original and amended tax returns and assistance in completing routine tax schedules and calculations.

All Other Fees

These services consist of French translation of financial statements and related continuous disclosure and other public documents containing financial information for us and certain of our subsidiaries as well as accounting and other research publications.

ADDITIONAL INFORMATION

Additional information, including directors' and officers' remuneration and indebtedness, principal holders of our securities, and securities authorized for issuance under equity compensation plans, where applicable, is contained in the Bank's Management Proxy Circular for the most recent annual meeting of shareholders. Additional financial information is provided in our Annual Consolidated Financial Statements and Management's Discussion and Analysis which are included in our 2016 Annual Report for the year ended October 31, 2016.

Copies of this Annual Information Form, our 2016 Annual Report and Management Proxy Circular in respect of the most recent annual meeting of shareholders may be obtained from Investor Relations at 200 Bay Street, North Tower, 4th Floor, Toronto, Ontario, M5J 2W7 (416-955-7802).

This Annual Information Form, the Annual Consolidated Financial Statements and Management's Discussion and Analysis for the year ended October 31, 2016, as well as additional information about us may be found on our website at rbc.com, on SEDAR, the Canadian Securities Administrators' website, at sedar.com, and on the EDGAR section of the SEC's website at sec.gov.

Information contained in or otherwise accessible through the websites mentioned in this Annual Information Form does not form a part of this Annual Information Form. All references in this Annual Information Form to websites are inactive textual references and are for your information only.

TRADEMARKS

Trademarks used in this annual information form include the LION & GLOBE Symbol, ROYAL BANK OF CANADA, RBC, RBC CAPITAL MARKETS and RBC ENVIRONMENTAL BLUEPRINT, which are trademarks of Royal Bank of Canada used by Royal Bank of Canada and/or by its subsidiaries under license. All other trademarks mentioned in this annual information form, which are not the property of Royal Bank of Canada, are owned by their respective holders.

APPENDIX A – PRINCIPAL SUBSIDIARIES

Principal subsidiaries (1)	Principal office address (2)	Carrying value of voting shares owned by the Bank (3)
Royal Bank Holding Inc.	Toronto, Ontario, Canada	52,178
Royal Mutual Funds Inc.	Toronto, Ontario, Canada	
RBC Insurance Holdings Inc.	Mississauga, Ontario, Canada	
RBC Insurance Company of Canada	Mississauga, Ontario, Canada	
RBC Life Insurance Company	Mississauga, Ontario, Canada	
RBC Direct Investing Inc.	Toronto, Ontario, Canada	
RBC Phillips, Hager & North Investment Counsel Inc.	Toronto, Ontario, Canada	
R.B.C. Holdings (Bahamas) Limited	Nassau, New Providence, Bahamas	
RBC Caribbean Investments Limited	George Town, Grand Cayman, Cayman Islands	
Royal Bank of Canada Insurance Company Ltd.	St. Michael, Barbados	
Investment Holdings (Cayman) Limited	George Town, Grand Cayman, Cayman Islands	
RBC (Barbados) Funding Ltd.	St. Michael, Barbados	
Capital Funding Alberta Limited	Calgary, Alberta, Canada	
RBC Global Asset Management Inc.	Toronto, Ontario, Canada	
RBC Investor Services Trust	Toronto, Ontario, Canada	
RBC Investor Services Bank S.A.	Esch-sur-Alzette, Luxembourg	
RBC (Barbados) Trading Bank Corporation	St. James, Barbados	
BlueBay Asset Management (Services) Ltd	London, England	
RBC USA Holdco Corporation (2)	New York, New York, U.S.	18,771
RBC Capital Markets, LLC (2)	New York, New York, U.S.	
RBC Bank (Georgia), National Association (2)	Atlanta, Georgia, U.S.	
City National Bank	Los Angeles, California, U.S.	
RBC Global Asset Management (U.S.) Inc.	Minneapolis, Minnesota, U.S.	
RBC Dominion Securities Limited	Toronto, Ontario, Canada	7,926
RBC Dominion Securities Inc.	Toronto, Ontario, Canada	
RBC Holdings (Barbados) Ltd.	St. Michael, Barbados	3,556
RBC Financial (Caribbean) Limited	Port of Spain, Trinidad and Tobago	
RBC Finance S.à r.l./B.V. (2)	Amsterdam, Netherlands	3,205
RBC Holdings (Luxembourg) S.A R.L.	Luxembourg, Luxembourg	
RBC Holdings (Channel Islands) Limited	Jersey, Channel Islands	
Royal Bank of Canada (Channel Islands) Limited	Guernsey, Channel Islands	
RBC Capital Trust	Toronto, Ontario, Canada	1,633
RBC Europe Limited	London, England	1,593
Royal Bank Mortgage Corporation	Toronto, Ontario, Canada	1,118
The Royal Trust Company	Montreal, Quebec, Canada	619
Royal Trust Corporation of Canada	Toronto, Ontario, Canada	255
RBC Covered Bond Guarantor Limited Partnership	Toronto, Ontario, Canada	166

(1) The Bank directly or indirectly controls each subsidiary.

(2) Each subsidiary is incorporated or organized under the laws of the state or country in which the principal office is situated, except for RBC USA Holdco Corporation which is incorporated under the laws of the State of Delaware, U.S., RBC Capital Markets, LLC, which is organized under the laws of the State of Minnesota, U.S. RBC Finance S.à r.l. / B.V. is a company incorporated in the Netherlands with its official seat in Amsterdam, the Netherlands, and place of effective management, central administration, and principal establishment in Luxembourg, Grand Duchy of Luxembourg. RBC Bank (Georgia), National Association is a national banking association organized under the laws of the U.S. with its main office in Atlanta, Georgia and management offices in Raleigh, North Carolina.

(3) The carrying value (in millions of dollars) of voting shares is stated as the Bank's equity in such investments.

APPENDIX B – EXPLANATION OF RATINGS AND OUTLOOK

Institution	Rating	Outlook
Moody's	• Obligations rated 'Aa' are judged to have high intrinsic, or standalone, financial strength, and subject to very low credit risk. • Obligations rated 'A' are judged to be upper-medium grade intrinsic, or standalone, financial strength, subject to lower credit risk. • Issuers assessed Baa are judged to have medium-grade intrinsic, or standalone, financial strength, subject to moderate credit risk and, as such, may possess certain speculative credit elements absent any possibility of extraordinary support from an affiliate or a government. • Issuers (or supporting institutions) rated Prime-1 have a superior ability to repay short-term debt obligations. • The modifier 3 indicates a ranking in the lower end of that generic rating category.	A rating outlook is an opinion regarding the likely direction of an issuer's rating over the medium term.
Standard & Poor's	• An obligation rated 'AA' differs from the highest-rated obligations only to a small degree. The obligor's capacity to meet its financial commitment on the obligation is very strong. • An obligation rated 'A' has strong capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. • The addition of a plus or minus sign shows the relative standing within the major rating categories. • An obligation rated 'BBB' exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation. • A short term obligation rated 'A-1+' has extremely strong capacity to meet its financial commitments.	A rating outlook assesses the potential direction of a long-term credit rating over the intermediate term (typically six months to two years) and is not necessarily a precursor of a rating change.
Fitch	• 'AA' ratings denote expectations of very low credit risk and are judged to be of very high credit quality. They indicate very strong capacity for payment of financial commitments. This capacity is not significantly vulnerable to foreseeable events. • The modifiers "+" or "-" may be appended to a rating to denote relative status within major rating categories. • An obligation rated 'F1' has the highest short-term credit quality. It indicates the strongest intrinsic capacity for timely payment of financial commitments. The modifier '+' denotes any exceptionally strong credit feature.	Rating Outlooks indicate the direction a rating is likely to move over a one- to two-year period and does not imply that a rating change is inevitable.
DBRS	• An obligation rated 'AA' is of superior credit quality. The capacity for the payment of financial obligations is considered high and it is unlikely to be significantly vulnerable to future events. In many cases they differ from obligations rated 'AAA' only to a small degree. • Preferred shares rated Pfd-2 are of satisfactory credit quality. Protection of dividends and principal is still substantial, but earnings, the balance sheet and coverage ratios are not as strong as Pfd-1 rated companies. Generally, Pfd-2 ratings correspond with companies whose senior bonds are rated in the A category. • R-1 (high) is the highest credit quality. The capacity for the payment of short-term financial obligations as they fall due is exceptionally high. Unlikely to be adversely affected by future events. • Each rating category is denoted by the subcategories "high" and "low". The absence of either a "high" or "low" designation indicated the rating is in the middle of the category.	A Positive or Negative Trend is not an indication that a rating change is imminent. Rather, a Positive or Negative Trend represents an indication that there is a greater likelihood that the rating could change in the future.

Institution	Rating	Outlook
Kroll Bond Rating Agency	• An obligation rated 'AA' is determined to have minimal risk of loss due to credit-related events. Such obligors and obligations are deemed very high quality. • A short-term obligation rated K1 has a very strong ability to meet short-term obligations. • The modifiers "-" or "+" may be appended to ratings in categories AA through CCC to indicate, respectively, upper and lower risk levels within the broader category.	A rating outlook is an indication of the likely direction of an issuer's rating over the medium term, generally encompassing a horizon not to exceed two years and is not necessarily a precursor to a rating change.

WHAT THE RATINGS ADDRESS:

Short-term and Long-term Senior Debt

Short-term and long-term senior debt credit ratings are the current opinion of the rating agency on creditworthiness of an obligor with respect to fixed-income obligations whose original maturity is of a short and medium to long-term nature, respectively. They address the possibility that a financial obligation will not be honoured as promised and reflect both the likelihood of default and any financial loss suffered in the event of default.

Subordinated Debt

Subordinated debt credit ratings are the current opinion of the rating agency on creditworthiness of an obligor with respect to a specific financial obligation and a specific class of financial obligation for a specific financial program. Ratings take into consideration the creditworthiness of guarantors, insurers, or other forms of credit enhancement on the obligation and takes into account the currency in which the obligation is denominated.

Preferred Stock

Preferred stock ratings address the issuer's capacity and willingness to pay dividends and principal, in case of limited life, on a timely basis. They address the likelihood of timely payment of dividends, notwithstanding the legal ability to pass on or defer a dividend payment.

Rating Outlook

Rating Outlook assesses the potential direction of a credit rating over the intermediate to longer term. In determining a Rating Outlook consideration is given to any changes in the economic and fundamental business conditions. An Outlook is not necessarily a precursor of a rating change.

APPENDIX C – AUDIT COMMITTEE MANDATE

ROYAL BANK OF CANADA
(hereinafter referred to as the "Bank")
effective November 1, 2016

A. PURPOSE AND DUTIES OF THE COMMITTEE

1. General Purpose

The Audit Committee is responsible for assisting the Bank's board of directors (the "Board") in its oversight of (i) the integrity of the Bank's financial statements; (ii) the qualifications, performance and independence of the external auditors; (iii) the performance of the Bank's internal audit function; (iv) internal controls; and (v) compliance with legal and regulatory requirements.

2. Financial Statements and other Documents

The Committee will regularly review and discuss the following:

a) prior to review and approval by the Board, the Bank's annual statement which includes its annual consolidated financial statements, its quarterly financial statements, and related management's discussion and analysis;

b) earnings releases on interim and annual results, the annual information form, the annual report and other financial information, earnings guidance and presentations provided to analysts, rating agencies and the public;

c) such other periodic disclosure documents as requested by regulators or that may be required by law;

d) investments and transactions brought to the Committee's attention that could adversely affect the Bank's well-being;

e) prospectuses relating to the issuance of securities of the Bank;

f) representations provided by management to the auditors, where appropriate;

g) reports on any litigation matters which could significantly affect the Bank;

h) reports from the Chief Compliance Officer (the "CCO") on regulatory compliance matters, and from the Chief Anti-Money Laundering Officer (the "CAMLO") on anti-money laundering matters; and

i) other reports as required to be communicated by the auditors by the Canadian Public Accountability Board, the Office of the Superintendent of Financial Institutions, and the U.S. Public Company Accounting Oversight Board.

The Committee will ensure that adequate procedures are in place for the review of the Bank's public disclosure of financial information derived from the Bank's financial statements, and will periodically assess the adequacy of these procedures.

3. External Auditor

Subject to the shareholders' powers conferred by the *Bank Act*, the Committee will recommend the appointment (or revocation thereof) of any registered public accounting firm (including the external auditor) engaged to prepare or issue an audit report or to perform other audit, review or attest services. The Committee will fix the remuneration and oversee the work of these accounting firms, including the resolution of disagreements with management regarding financial reporting. Such accounting firms will report directly to the Committee.

As part of its oversight of the external auditor the Committee will:

a) meet with the external auditor to review and discuss the annual audit plan, the results of the audit, the auditor's report with respect to the annual statement, and all other reports, returns and transactions as required by applicable laws;

b) approve all audit engagement fees and terms, as well as the terms of any permitted non-audit services to be provided by the external auditor to the Bank, with such approvals to be given specifically or pursuant to preapproval policies and procedures adopted by the Committee in accordance with applicable laws;

c) review any concerns that may be brought forward by the external auditor, including any difficulties they may encounter in conducting their audit, as well as management's response to such concerns;

d) review material correspondence between the external auditor and management relating to audit findings;

e) taking into account the opinions of management and the Bank's internal auditor, annually assess the external auditor's qualifications and performance, including relevant experience, geographical reach, professional scepticism, quality of services and communications, and independence and objectivity;

f) review formal written statements delineating all relationships between the external auditor and the Bank that may impact its independence and objectivity;

g) annually assess the risk of the external auditor withdrawing from the audit;

h) discuss with the external auditor and with management the annual audited financial statements and quarterly financial statements, as well as related management's discussion and analysis;

i) review hiring policies concerning partners, employees and former partners and employees of the present and former external auditors;

j) review and evaluate the qualifications, performance and independence of the external auditor's lead partner and discuss the timing and process for implementing the rotation of the lead audit partner, the concurring audit partners and any other active audit engagement team partner; and

k) at least annually, obtain and review a report by the external auditor describing: (i) the external auditor's internal quality-control procedures; and (ii) any material issues raised by the most recent internal quality-control review or peer review of the external auditors, or by any inquiry or investigation by governmental or professional authorities, within the preceding five years, respecting independent audits carried out by the external auditor, and any steps taken to deal with any such issues.

4. Oversight of Independent Control Functions

The Committee will oversee the finance, compliance, anti-money laundering and internal audit functions, having regard to their independence from the businesses whose activities they review. The Committee will review and approve the appointment (or removal) of each of the Chief Financial Officer (the "CFO"), the CCO, the CAMLO, and the Chief Internal Auditor (the "CIA"), as well as their respective mandates and the mandates or charters of their respective functions. The Committee will approve each of the functions' organizational structures, budgets and resources. Every year the Committee will assess the effectiveness of each of the CFO, CCO, CAMLO and CIA and their respective functions. It will also periodically review independent assessments of each of these functions. Moreover, it will annually review and approve the internal audit function's overall risk methodology.

5. Internal Control

The Committee will assist in the oversight of internal control by engaging in the following activities:

a) requiring management to implement and maintain appropriate systems of internal control, including internal controls over financial reporting and for the prevention and detection of fraud and error;

b) evaluating and approving systems of internal control and meeting regularly with the CIA and with management to assess the adequacy and effectiveness of these systems;

c) receiving reasonable assurances on a regular basis from management that the organization is in control;

d) reviewing reports from the Chief Executive Officer (the "CEO") and the CFO regarding any significant deficiency or material weakness in the design or operation of internal controls over financial reporting and the detection of fraud involving management or other employees who have a significant role in the Bank's internal control over financial reporting;

e) reviewing and approving the Bank's disclosure policy and reviewing reports on the effectiveness of the Bank's disclosure controls and procedures; and

f) reviewing the process relating to the CEO and CFO's certifications on the design and effectiveness of the Bank's disclosure controls and procedures and internal control over financial reporting, and the integrity of the Bank's quarterly and annual financial statements.

6. Internal Auditor

The Committee will regularly meet with the CIA to review and approve the annual internal audit plan and review internal audit activities. The Committee will review and discuss with the CIA issues reported to management by the internal audit function and management's responses and/or corrective actions. The Committee will also evaluate the status of identified control weaknesses, as well as the adequacy and degree of compliance with the Bank's systems of internal control. Other issues that the Committee may review with the CIA include audit scope, information access, resource limitations or any other difficulties encountered by the internal audit function.

7. Capital Management

The Committee will review capital transactions and may designate and authorize the issue of (i) First Preferred Shares and (ii) securities qualifying as additional Tier 1 capital under capital adequacy guidelines issued by the Superintendent of Financial Institutions. The Committee may also review and approve securities disclosure documents in connection with issues of the Bank's subordinated indebtedness as provided in the relevant resolution of the Board.

The Committee will review the adequacy and effectiveness of internal controls related to capital management. It will also discuss with the external auditors any matters arising from the audit that may have an impact on regulatory or capital disclosures included in the Bank's annual statement.

8. Committee Reports

The Committee is responsible for preparing any report from the Committee that may be included in the Bank's annual proxy statement.

9. Other

a) The Committee will discuss major issues regarding accounting principles and financial statement presentations, including significant changes in the Bank's selection or application of accounting principles and analyses prepared by management or the external auditors regarding financial reporting issues and judgments made in connection with the preparation of the financial statements;

b) The Committee will establish procedures for managing complaints received by the Bank regarding accounting, internal accounting controls or auditing matters, as well as procedures for the confidential and anonymous submission by employees of concerns regarding accounting, internal accounting controls or auditing matters. The Committee will receive reports from the Ombudsman at each Committee meeting and will meet with the Ombudsman annually in relation to these procedures;

c) The Committee will establish and monitor procedures to provide disclosure of information to customers and for dealing with customer complaints as required by the *Bank Act*;

d) The Committee will review and discuss any reports concerning material violations submitted to it by the Bank's legal counsel pursuant to applicable law and policy;

e) The Committee will discuss the major financial risk exposures of the Bank and the steps management has taken to monitor and control such exposures; and

f) Subject to the laws applicable to the subsidiary, the Committee may perform for and on behalf of a subsidiary the functions of an audit committee of the subsidiary.

B. COMMITTEE COMPOSITION AND PROCEDURES

1. Composition of Committee

The Committee will be composed of five or more directors. No Committee member may be an officer or employee of the Bank or of an affiliate of the Bank. Each Committee member will be (i) unaffiliated, as determined in accordance with the regulations made under the *Bank Act*, and (ii) independent, as determined by director independence standards adopted by the Board. Committee membership will reflect a balance of experience and expertise required to fulfill the Committee's mandate.

All Committee members will be financially literate or become financially literate within a reasonable period after appointment to the Committee. At least one member will have accounting or financial management expertise. No member may serve on the audit committees of more than two other public companies, unless the Board determines such simultaneous service would not impair the member's ability to serve effectively on the Committee.

2. Appointment of Committee Members

The Board will appoint or reappoint the Committee members at the annual organizational meeting of the directors. In the normal course members will serve a minimum of three years. Each member will remain a member until a successor is appointed, unless the member resigns, is removed or ceases to be a director. The Board may fill a vacancy that occurs in the Committee at any time.

3. Committee Chair and Secretary

The Board will appoint or reappoint a Committee Chair from among the members of the Committee. If the Board fails to do so, the Committee members will make the appointment or re-appointment. In the normal course the Committee Chair will serve a minimum of three years. The Committee Chair will not be a former employee of the Bank or of an affiliate. The Secretary of the Committee need not be a director.

4. Time and Place of Meetings

Meetings may be called by any Committee member, the external auditors or the CFO. The Committee members will determine the time and place of and the procedure at meetings, provided that the Committee meets at least quarterly. The Committee may request any officer or employee of the Bank or the Bank's outside counsel or external auditors to attend a meeting of the Committee or to meet with any members of, or consultants to, the Committee.

5. Quorum

A quorum for meetings will be three members.

6. Notice of Meetings

Notice of the time and place of each meeting will be generally given in writing or by telephone, or by electronic or other communications facilities, to each Committee member and to the external auditors at least 24 hours prior to the time fixed for such meeting; however,

a) a member may in any manner waive notice of a meeting and attendance of a member at a meeting is a waiver of notice of the meeting, except where a member attends a meeting for the express purpose of objecting to the transaction of any business on the grounds that the meeting is not lawfully called;

b) a resolution in writing signed by all the members entitled to vote on that resolution at a Committee meeting, other than a resolution of the Committee carrying out its duties under subsection 194(3) of the *Bank Act*, will be as valid as if it had been passed at a meeting of the Committee; and

c) capital transactions may be reviewed and/or authorized at a meeting of which at least one hour prior notice is given.

7. Reporting to the Board

The Committee will report to the Board following each meeting with respect to its activities and recommendations. It will also report to the Board on the annual statement and returns that must be approved by the directors under the *Bank Act*.

8. Access to Management and External Advisors

In fulfilling its responsibilities, the Committee will have unrestricted access to management and employees of the Bank. The Committee will select, retain, oversee, terminate and approve the fees of any external advisor that the Committee deems necessary, including any legal or accounting advisor, to assist it in fulfilling its responsibilities. The Bank will provide appropriate funding, as determined by the Committee, for any such engagement.

The Committee may also investigate any matter with full access to all books, records, facilities, management and employees of the Bank.

9. Private Meetings

At least quarterly the Committee will meet with no members of management present and have separate private meetings with the external auditors, and each of the CIA, the CFO, the CCO, the CAMLO and the General Counsel, to discuss any matters that the Committee or these parties believe should be discussed.

10. Evaluation of Effectiveness and Review of Mandate

The Committee will annually review and assess the adequacy of its mandate and evaluate its effectiveness in fulfilling its mandate.

APPENDIX D – PRE-APPROVAL POLICIES AND PROCEDURES

Policies and Procedures
for the Monitoring, and Pre-Approval of Services
to be Performed by Public Accounting Firms
and the Review of the External Auditors
(effective October 19, 2016)

Mandate

1. The mandate of the Audit Committee established by the Board of Directors ("Board") confers on the Committee the authority and responsibility (among other things) to:
   - Pre-approve all audit and any legally permissible non-audit services to be provided by the external auditors and all audit, review and attest services provided by any other public accounting firm, with such approval to be given either specifically or pursuant to pre-approval policies and procedures adopted by the Committee; and
   - To complete an annual and five year comprehensive reviews of the external auditor's performance and to recommend to the Board the selection and termination of the external auditor subject to shareholder approval.

Purpose

2. These Policies and Procedures are intended to:
   a) specify the methods by which the Audit Committee may pre-approve the provision of audit, review and attest services by any public accounting firm to the Bank and its subsidiaries;
   b) specify the methods by which the Audit Committee may pre-approve the provision of non-audit services to the Bank and its subsidiaries by the Bank's external auditors and their affiliates (the "auditors") that do not impair the independence of the auditors under applicable laws and professional standards, including the rules of the Chartered Professional Accountants Canada, the Public Company Accounting Oversight Board ("PCAOB"), the Canadian Securities Administrators and the U.S. Securities and Exchange Commission;
   c) set forth procedures designed to ensure that any services to be provided by the auditors and that any audit, review or attestation services to be performed by any other public accounting firm have been properly authorized and pre-approved under the authority of the Audit Committee, and that the Committee is promptly informed of each service;
   d) ensure that the Audit Committee's responsibilities are not delegated to management in violation of applicable law;
   e) specify the policies relating to the annual and comprehensive evaluation of the external auditor and selection of the external auditor by the Audit Committee for recommendation to the Board.

Required Approval of Audit and Non-Audit Services

3. The Audit Committee shall pre-approve all engagements of the auditors by:
   a) the Bank; or
   b) any subsidiary.

4. The Audit Committee shall pre-approve engagements of any public accounting firm to provide audit, review or attest services to:
   a) the Bank; or
   b) any subsidiary.

5. The Audit Committee shall evidence its pre-approval by resolution of the Committee or through the exercise of delegated authority in accordance with these Policies and Procedures.

6. “Subsidiary” has the meaning set forth in Rule 1-02(x) of the U.S. Securities and Exchange Commission’s Regulation S-X.

7. For the purpose of these Policies and Procedures and any pre-approval:

   a) “Audit services” include services that are a necessary part of the audit process and any activity that is a necessary procedure used by the accountant in reaching opinions on the financial statements and on internal control over financial reporting as is required under applicable auditing standards (“AAS”), including technical reviews to reach an audit judgment on complex accounting issues;

   b) The term “audit services” is broader than those services strictly required to perform an audit pursuant to AAS and include such services as:
      i) the issuance of comfort letters and consents in connection with offerings of securities;
      ii) the performance of domestic and foreign statutory audits;
      iii) attest services required by statute or regulation; and
      iv) assistance with and review of documents filed with the Office of the Superintendent of Financial Institutions, Canadian Securities Administrators, the Securities and Exchange Commission, the Board of Governors of the Federal Reserve Board and other regulators having jurisdiction over the activities of the Bank and its subsidiaries, and responding to comments from such regulators;

   c) “Audit-related” services are assurance and related services traditionally performed by the principal accountant and that are reasonably related to the performance of the audit or review of financial statements and not categorized under “audit fees” for disclosure purposes.

      “Audit-related services” include:
      i) employee benefit plan audits, including audits of employee pension plans,
      ii) due diligence related to mergers and acquisitions,
      iii) consultations and audits in connection with acquisitions, including evaluating the accounting treatment for proposed transactions;
      iv) internal control reviews;
      v) attest services not required by statute or regulation; and
      vi) consultations regarding financial accounting and reporting standards.

      Non-financial operational audits are not “audit-related” services;

   d) “Review services” are services applied to unaudited financial statements and consist of the inquiry and analytical procedures that provide the accountant with a reasonable basis for expressing limited assurance that there are no material modifications that should be made to financial statements for them to be in conformity with International Financial Reporting Standards or, if applicable, any other comprehensive basis of accounting;

   e) “Attest” services are those engagements where the accountant issues an examination, a review, or an agreed-upon procedures report on a subject matter, or an assertion about the subject matter that is the responsibility of another party. Examples of the subject matter of an “attest” engagement include: examinations (i.e., audits) of financial forecasts and projections; reviews of pro-forma financial information; reporting on a company’s internal control over financial reporting; and examinations of compliance with contractual arrangements or laws and regulations.

External Auditor Selection and Appointment

8. The Audit Committee shall monitor, review and assess the quality of the external auditor on an annual basis. The annual assessment will include:

   a) quality and thoroughness of the audit approach and methodology;
   b) level of professional skepticism, and critical judgments applied by the audit team;
   c) independence of the external audit firm and the engagement partner;
   d) skills and knowledge of the audit team;
   e) level of understanding of our businesses and the financial services industry;
   f) sufficiency of resources and ability to complete the audit in a timely manner;
   g) partner rotation;
   h) value for money;
   i) quality of communications;

j) risk of likelihood of withdrawal from the audit;
k) input from senior management of RBC;
l) input from RBC Internal Audit Services;
m) a self assessment prepared by the auditor; and
n) audit quality metrics and other matters as determined by the Audit Committee or the Board of Directors.

9. At least every five years the Audit Committee will conduct a comprehensive assessment of the external auditor. The assessment will include:

a) considerations included within the annual assessment;
b) performance since the last comprehensive review, or appointment of the external auditor;
c) quality and continuity of the engagement team;
d) tenure of the auditor;
e) incidence of independence threats and effectiveness of applied safeguards;
f) track record of the auditor applying professional skepticism; and
g) responsiveness to changes in the Bank's businesses (i.e. significant acquisitions or changes to systems) and calls for improvement from regulators, inspectors, Audit Committees or management.

10. The Audit Committee will take the following into account in deciding whether to recommend the tendering of the external audit engagement of the Bank:

a) the results of the annual and comprehensive assessments (refer to factors described in sections 8 and 9);
b) the impact of regulatory and legislative requirements, including mandatory tendering and rotation requirements on the Bank and its subsidiaries; and
c) other factors deemed relevant by the Audit Committee or the Board.

Delegation

11. The Audit Committee may from time to time delegate to one or more of its members who are "independent" (within the meanings of applicable law and the rules or policies of a securities commission having jurisdiction, and the New York Stock Exchange) the power to pre-approve from time to time:

a) audit, review or attest services to be provided by any public accounting firm (including the auditors) that have not been otherwise approved by the Committee;
b) permissible non-audit services to be provided by the auditors that have not otherwise been approved by the Committee, and
c) changes in the scope of pre-approved engagements and the maximum estimated fees for engagements that have been pre-approved by the Committee.

12. The member(s) exercising such delegated authority must report at the next regularly scheduled meeting of the Audit Committee any services that were pre-approved under this delegated authority since the date of the last regularly scheduled meeting.

13. The member(s) exercising delegated authority may evidence his or her approval by signing an instrument in writing that describes the engagement with reasonable specificity, or by signing an engagement letter containing such a description.

14. In addition, member(s) exercising delegated authority may pre-approve an engagement orally, if any such oral approval is promptly confirmed in writing. Such written confirmation may be given by fax or e-mail and must describe the engagement with reasonable specificity.

Responsibilities of External Auditors

15. To support the independence process, the external auditors shall:

a) confirm in engagement letters that performance of the work will not impair independence;
b) satisfy the Audit Committee that they have in place comprehensive internal policies and processes to ensure adherence, world-wide, to independence requirements, including robust monitoring and communications;
c) provide communication and confirmation to the Committee on independence on a regular basis, and at least annually;
d) provide for Committee approval, in connection with each annual audit engagement, a detailed scope of services outlining each individual audit to be performed and a detailed description of audit-related services;

e) utilize the tracking numbers assigned by management to all pre-approved services in all fee billings and correspondence, provide detailed annual fee reporting and review management's detailed quarterly fee reporting.
f) communicate to the Audit Committee all matters required to be communicated by the Canadian Public Accountability Board and U.S. Public Company Accounting Oversight Board.
g) maintain certification by the Canadian Public Accountability Board and registration with the U.S. Public Company Accounting Oversight Board; and
h) review their partner rotation plan and advise the Committee on an annual basis.

Engagements

16. The Audit Committee will not, as a general rule, pre-approve a service more than one year prior to the time at which it is anticipated that the firm of accountants will be engaged to provide the service.

17. Engagements will not be considered to be revolving in nature and may not operate from year-to-year without reapproval.

18. All audit and non-audit services to be provided by the auditors, and all audit, review or attest services to be provided by any public accounting firm, shall be provided pursuant to an engagement letter that shall:

    a) be in writing and signed by the auditors or public accounting firm;
    b) specify the particular services to be provided;
    c) specify the period in which the services will be performed;
    d) specify the maximum total fees to be paid; and
    e) in the case of engagements of the auditors, include a confirmation by the auditors that the services are not within a category of services the provision of which would impair their independence under applicable law and Canadian and U.S. generally accepted auditing standards.

19. Management shall, before signing and delivering an engagement letter on behalf of the Bank or a subsidiary and before authorizing the commencement of an engagement:

    a) obtain an engagement letter in accordance with the foregoing;
    b) confirm that the services are described in the engagement letter accurately and with reasonable specificity;
    c) obtain confirmation from the auditors that they have conducted an analysis that supports their conclusion that performance of the services will not impair their independence;
    d) with respect to engagements for the provision of services other than audit and audit-related services, obtain confirmation from legal counsel of the Bank that performance of the services will not impair independence; and
    e) verify that the performance of the services has specifically been approved by the Audit Committee or a member in accordance with authority delegated by the Committee.

All engagement letters entered into pursuant to these Policies and Procedures shall be made available to the Audit Committee.

Tax Services

20. The Audit Committee, and any member in the exercise of delegated power, shall consider the provision of tax services by the auditors on an engagement-by-engagement basis.

21. The Audit Committee shall not pre-approve, and any member of the Audit Committee may not exercise delegated power to engage the auditors to provide, tax services to the Bank or a subsidiary:

    a) to represent the Bank or a subsidiary before a tax or other court;
    b) if the provision of the services would be prohibited, as prescribed by paragraph 25 of these Policies and Procedures; or
    c) related to marketing, planning or opinion in favour of the tax treatment of (1) a transaction offered under conditions of confidentiality and for which a fee has been or will be paid by the Bank; or (2) a transaction that was initially recommended directly or indirectly, by the accountant and a significant purpose of which is tax avoidance, unless the proposed tax treatment is at least more likely than not to be allowable under applicable tax laws.

22. The Audit Committee shall not pre-approve, and any member of the Audit Committee may not exercise delegated power to engage the auditors to provide, tax services to a person in a financial oversight role at the Bank, or an immediate family member of such a person, except as would be permitted by the PCAOB rules.

Other Non-Audit Services

23. The Audit Committee, and any member in the exercise of delegated power, shall consider the provision of other non-audit services (non-audit services other than audit-related services and tax services, and including non-audit services relating to internal control and business recovery services) by the auditors on an engagement-by-engagement basis. Any approval of non-audit services relating to internal control must be preceded by a discussion with the auditors of the potential effects of the services on independence as required by the rules of the PCAOB.

Value-Added Services

24. The Audit Committee recognizes and approves of the fact that the auditors from time to time provide, without charge or commitment, value added services to the Bank and its subsidiaries that do not involve an engagement of the auditors. Such value added services may include surveys, educational sessions, workshops, roundtable meetings with peers, benchmarking studies, and monitoring of contest draws as an independent observer. The Audit Committee receives and reviews periodic reports from management and the auditors providing representative examples of such services as part of its monitoring of the Bank's overall relationship with the auditors.

Prohibited Services

25. The Audit Committee shall not pre-approve, and any member may not exercise delegated power to engage the auditors to provide, any services, including tax services or business recovery services, that (i) provide for a contingency or commission fee arrangement; or (ii) involve the auditors performing any of the non-audit services set forth in paragraph (c)(4) of Rule 2-01 of the U.S. Securities and Exchange Commission's Regulation S-X, which include:

    a. providing bookkeeping or other services related to the accounting records or financial statements of the Bank or any of its subsidiaries,
    b. providing financial information systems design and implementation to the Bank or any of its subsidiaries,
    c. providing actuarial services to the Bank or any of its subsidiaries,
    d. providing internal audit outsourcing services to the Bank or any of its subsidiaries,
    e. providing human resources services to the Bank or any of its subsidiaries,
    f. providing broker-dealer, investment adviser, or investment banking services to the Bank or any of its subsidiaries,
    g. functioning in the role of management for the Bank or any of its subsidiaries,
    h. auditing their own work in relation to the Bank or any of its subsidiaries,
    i. providing appraisal or valuation services, contribution in kind reports or fairness opinions to the Bank or any of its subsidiaries,
    j. serving in an advocacy role for the Bank or any of its subsidiaries,
    k. providing legal services to the Bank or any of its subsidiaries,
    l. providing services that fall within the category of "expert" services that are prohibited by applicable law to the Bank or any of its subsidiaries, or
    m. providing services to the Bank or any of its subsidiaries that would otherwise compromise their independence under applicable regulatory guidance.

For the purposes of the Prohibited Services listed in this Section 25 above, a "subsidiary" includes any entity for which the Bank uses the equity method of accounting and where it is material to the Bank. Therefore, the Audit Committee is not permitted to pre-approve the provision of the prohibited services listed above by the auditors to these entities.

Timely Reporting to the Audit Committee

26. Management shall provide a quarterly written report to the Audit Committee of services performed and related fees, at the scheduled meeting of the Committee held following the end of each fiscal quarter end.

No Delegation to Management

27. Nothing in these Policies and Procedures shall be interpreted as a delegation to management of the Audit Committee's responsibilities in violation of applicable law.

Effective Date

28. These updated Policies and Procedures are effective as and from October 19, 2016.

Disclosure

29. The Bank shall disclose these Policies and Procedures in its periodic filings, as required by applicable law.

Review

30. The Audit Committee shall review and reassess the adequacy of these Policies and Procedures on a triennial basis.

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, 2016, compared to the preceding two fiscal years. This MD&A should be read in conjunction with our 2016 Annual Consolidated Financial Statements and related notes and is dated November 29, 2016. 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 2016 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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See our Glossary for definitions of terms used throughout this document.

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 2016 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 and market review and outlook for Canadian, U.S., European and global economies, the regulatory environment in which we operate, the outlook and priorities for each of our business segments, and the risk environment including our liquidity and funding risk. 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 Risk management and Overview of other risks sections of our 2016 Annual Report; global uncertainty, the Brexit vote to have the United Kingdom leave the European Union, weak oil and gas prices, cyber risk, anti-money laundering, exposure to more volatile sectors, technological innovation and new Fintech entrants, increasing complexity of regulation, data management, litigation and administrative penalties; 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 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 2016 Annual Report are set out in the Overview and outlook section and for each business segment under the heading Outlook and priorities. 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 Risk management and Overview of other risks sections of our 2016 Annual Report.

Selected financial and other highlights

Table 1

(Millions of Canadian dollars, except per share, number of and percentage amounts)	2016	2015	2014	2016 vs. 2015 Increase (decrease)	
Total revenue	$ 38,405	$ 35,321	$ 34,108	$ 3,084	8.7%
Provision for credit losses (PCL)	1,546	1,097	1,164	449	40.9%
Insurance policyholder benefits, claims and acquisition expense (PBCAE)	3,424	2,963	3,573	461	15.6%
Non-interest expense	20,136	18,638	17,661	1,498	8.0%
Income before income taxes	13,299	12,623	11,710	676	5.4%
Net income	$ 10,458	$ 10,026	$ 9,004	$ 432	4.3%
Segments – net income					
Personal & Commercial Banking	$ 5,184	$ 5,006	$ 4,475	$ 178	3.6%
Wealth Management	1,473	1,041	1,083	432	41.5%
Insurance	900	706	781	194	27.5%
Investor & Treasury Services	613	556	441	57	10.3%
Capital Markets	2,270	2,319	2,055	(49)	(2.1)%
Corporate Support	18	398	169	(380)	(95.5)%
Net income	$ 10,458	$ 10,026	$ 9,004	$ 432	4.3%
Selected information					
Earnings per share (EPS) – basic	$ 6.80	$ 6.75	$ 6.03	$ 0.05	0.7%
– diluted	6.78	6.73	6.00	0.05	0.7%
Return on common equity (ROE) (1), (2)	16.3%	18.6%	19.0%	n.m.	(230) bps
Average common equity (1)	$ 62,200	$ 52,300	$ 45,700	$ 9,900	18.9%
Net interest margin (on average earning assets) (3)	1.70%	1.71%	1.86%	n.m.	(1) bps
Total PCL as a % of average net loans and acceptances	0.29%	0.24%	0.27%	n.m.	5 bps
PCL on impaired loans as a % of average net loans and acceptances	0.28%	0.24%	0.27%	n.m.	4 bps
Gross impaired loans (GIL) as a % of loans and acceptances (4)	0.73%	0.47%	0.44%	n.m.	26 bps
Liquidity coverage ratio (LCR) (5)	127%	127%	n.a.	n.m.	– bps
Capital ratios, Leverage ratio and multiples					
Common Equity Tier 1 (CET1) ratio (6)	10.8%	10.6%	9.9%	n.m.	20 bps
Tier 1 capital ratio (6)	12.3%	12.2%	11.4%	n.m.	10 bps
Total capital ratio (6)	14.4%	14.0%	13.4%	n.m.	40 bps
Assets-to-capital multiple (6)	n.a.	n.a.	17.0X	n.a.	n.a.
Leverage ratio (6)	4.4%	4.3%	n.a.	n.m.	10 bps
Selected balance sheet and other information (7)					
Total assets	$ 1,180,258	$ 1,074,208	$ 940,550	$ 106,050	9.9%
Securities	236,093	215,508	199,148	20,585	9.6%
Loans (net of allowance for loan losses)	521,604	472,223	435,229	49,381	10.5%
Derivative related assets	118,944	105,626	87,402	13,318	12.6%
Deposits	757,589	697,227	614,100	60,362	8.7%
Common equity	64,304	57,048	48,615	7,256	12.7%
Total capital risk-weighted assets	449,712	413,957	372,050	35,755	8.6%
Assets under management (AUM)	586,300	498,400	457,000	87,900	17.6%
Assets under administration (AUA) (8)	5,058,900	4,683,100	4,710,900	375,800	8.0%
Common share information					
Shares outstanding (000s) – average basic	1,485,876	1,442,935	1,442,553	42,941	3.0%
– average diluted	1,494,137	1,449,509	1,452,003	44,628	3.1%
– end of period	1,485,394	1,443,423	1,442,233	41,971	2.9%
Dividends declared per common share	$ 3.24	$ 3.08	$ 2.84	$ 0.16	5.2%
Dividend yield (9)	4.3%	4.1%	3.8%	n.m.	20 bps
Common share price (RY on TSX) (10)	$ 83.80	$ 74.77	$ 80.01	$ 9.03	12.1%
Market capitalization (TSX) (10)	124,476	107,925	115,393	16,551	15.3%
Business information (number of)					
Employees (full-time equivalent) (FTE)	75,510	72,839	73,498	2,671	3.7%
Bank branches	1,419	1,355	1,366	64	4.7%
Automated teller machines (ATMs)	4,905	4,816	4,929	89	1.8%
Period average US$ equivalent of C$1.00 (11)	$ 0.755	$ 0.797	$ 0.914	$ (0.042)	(5.3)%
Period-end US$ equivalent of C$1.00	$ 0.746	$ 0.765	$ 0.887	$ (0.019)	(2.5)%

(1) 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.
(2) 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.
(3) Net interest margin (on average earning assets) is calculated as net interest income divided by average earning assets. Average amounts are calculated using methods intended to approximate the average of the daily balances for the period.
(4) GIL includes $418 million (2015 – $nil) related to the acquired credit impaired (ACI) loans portfolio from our acquisition of City National, with over 80% covered by loss-sharing agreements with the Federal Deposit Insurance Corporation (FDIC). ACI loans added 8 bps to our 2016 GIL ratio (2015 – n.a.). For further details, refer to Notes 2 and 5 of our 2016 Annual Consolidated Financial Statements.
(5) LCR is a new regulatory measure under the Basel III Framework, and is calculated using the Liquidity Adequacy Requirements (LAR) guideline. Effective in the second quarter of 2015, LCR was adopted prospectively. For further details, refer to the Liquidity and funding risk section.
(6) Capital and Leverage ratios presented above are on an "all-in" basis. Effective the first quarter of 2015, the Leverage ratio has replaced the Assets-to-capital multiple (ACM). The Leverage ratio is a regulatory measure under the Basel III framework. The ACM is presented on a transitional basis for prior periods. For further details, refer to the Capital management section.
(7) Represents period-end spot balances.
(8) AUA includes $18.6 billion and $9.6 billion (2015 – $21.0 billion and $8.0 billion; 2014 – $23.2 billion and $8.0 billion) of securitized residential mortgages and credit card loans, respectively. Prior period figures have been revised from those previously disclosed.
(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) Average amounts are calculated using month-end spot rates for the period.
n.a. not applicable
n.m. not meaningful

About Royal Bank of Canada

Royal Bank of Canada is Canada's largest bank, and one of the largest banks in the world, based on market capitalization. We are one of North America's leading diversified financial services companies, and provide personal and commercial banking, wealth management, insurance, investor services and capital markets products and services on a global basis. We have over 80,000 full- and part-time employees who serve more than 16 million personal, business, public sector and institutional clients through offices in Canada, the U.S. and 36 other countries. For more information, please visit 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 affluent, high net worth and ultra-high net worth clients 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:

ROYAL BANK OF CANADA

Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets
¡ Canadian Banking ¡ Caribbean & U.S. Banking	¡ Canadian Wealth Management ¡ U.S. Wealth Management (including City National) ¡ International Wealth Management ¡ Global Asset Management	¡ Canadian Insurance ¡ International Insurance		¡ Corporate and Investment Banking ¡ Global Markets ¡ Other

Corporate Support

¡ Technology & Operations ¡ Functions

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 2016 against our business strategies and strategic goals, refer to the Business segment results section.

Economic, market and regulatory review and outlook – data as at November 29, 2016

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.

Canada

The Canadian economy is expected to grow by 1.3% [1] during calendar 2016, which is below our estimate of 2.2% [1] as at December 1, 2015 and consistent with our estimate as at August 23, 2016. Growth over the first half of the calendar year was supported by solid consumer spending and housing activity, reflecting low interest rates and a resilient labour market. Business investment remained weak as firms in the energy sector continued to reduce capital spending. Weakness in the energy sector was compounded by wildfires in Alberta that resulted in temporary shutdowns by oil and gas producers, destroyed over 2,000 buildings and displaced 80,000 individuals. The economy has rebounded in the second half of the year as oil and gas production normalized and non-energy exports recovered from earlier weakness. The unemployment rate rose to 7.0%, slightly higher than July's rate of 6.9% as labour force participation increased. The Bank of Canada (BoC) has held the overnight rate steady in calendar 2016 amid persistent slack in the economy, due to slower-than-expected growth in non-energy industries, as well as inflation results that were below target.

In calendar 2017, we expect the Canadian economy will grow at a 1.8% [1] rate, driven by firm consumer spending, fiscal stimulus, stronger export growth and a modest recovery in business investment. Due to federal and provincial policy changes announced in 2016, we expect housing market activity will soften in calendar 2017. The BoC has maintained a cautious tone recently amid uncertainty surrounding the economic outlook; however, we expect the overnight rate will be held steady throughout 2017 as growth moves in line with the BoC's latest projection.

U.S.

The U.S. economy is expected to grow by 1.6% [1] in calendar 2016, which is below our estimate of 2.8% [1] as at December 1, 2015 and slightly above our estimate of 1.5% [1] as at August 23, 2016. Consumer spending growth was strong over the first half of the year, reflecting solid job growth, rising wages, elevated consumer confidence and low interest rates. However, declining inventory investment and a reduction in business investment, partially reflecting further weakness in the energy sector, had an adverse impact on growth earlier this year. The unemployment rate of 4.9% has been relatively stable this year amid rising labour force participation, falling within the range that the Federal Reserve (Fed) views as consistent with full employment. The Fed has noted that the case for higher rates continues to strengthen with growth having rebounded in the second half of the year and inflation picking up gradually. Barring an extended period of market volatility following the recent U.S. election result, we expect the Fed will raise the federal funds target range to 0.50%-0.75% in December from its current range of 0.25%-0.50%.

In calendar 2017, we expect the U.S. economy will grow at a 2.2% [1] rate as consumer spending growth remains firm and business investment picks up in both energy and non-energy industries. As growth continues at a solid pace, the labour market improves further and inflation rises toward the Fed's 2% target, we expect the gradual withdrawal of monetary policy stimulus to continue, with the Fed raising rates by another 50 basis points in calendar 2017. The recent U.S. election could result in policy changes that impact the economic outlook though any revisions to our expectations await further details being announced by the new administration.

Europe

The Eurozone economy is expected to grow by 1.6% in calendar 2016, which is below our estimate of 1.7% as at December 1, 2015, but slightly above our estimate of 1.5% as at August 23, 2016. The steady economic recovery has continued over the last year and the threat of deflation has subsided, although inflation remains well below the European Central Bank's (ECB) target. Growth has been driven by consumer spending and business investment, reflecting a gradually improving labour market and rising business sentiment. The unemployment rate of 10.0% in September matched the lowest level since July 2011. The ECB left monetary policy unchanged in October, awaiting the results of a review of its asset purchase program that will be available in December.

In calendar 2017, we expect the Eurozone economy will grow by 1.3% as political uncertainty, including evolving Brexit negotiations, weighs on business sentiment. We expect the ECB will continue to provide substantial monetary policy stimulus with monthly asset purchases likely to be extended beyond March 2017.

Financial markets

Global equity markets recorded minimal gains this year amid several periods of heightened volatility related to global growth concerns and political uncertainty related to Brexit and the U.S. election. Central banks have maintained highly stimulative monetary policy and some governments are increasing fiscal stimulus. Yields on Canadian and U.S. long-term government bonds generally declined over the first half of the year but increased more recently as inflation expectations rose. Oil prices hit year-to-date highs of around $50/barrel in October but declined more recently on concerns that the Organization of the Petroleum Exporting Countries (OPEC) would have difficulty reaching a consensus to cap output.

The macroeconomic headwinds discussed above, such as the volatility of oil prices, the potential for greater uncertainty or financial market instability related to Brexit and the U.S. election, and greater global economic uncertainty may alter our outlook and results for fiscal 2017 and future periods. These continuing pressures may lead to higher PCL in our wholesale and retail loan portfolios 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, over-the-counter (OTC) derivatives reform, initiatives to enhance requirements for institutions deemed systemically important to the financial sector, and changes to resolution regimes addressing government bail-in and total loss-absorbing capacity. We also continue to implement reforms enacted under the U.S. *Dodd-Frank Wall Street Reform and Consumer Protection Act* including those related to the Fed's enhanced prudential standards for Bank Holding Companies and Foreign Banking Organizations.

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 – Top and emerging risks section. For further details on our framework and activities to manage risks, refer to the Risk management and Capital management sections.

[1] Annualized rate

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 of our overall performance relative to our peers over a period of time.

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 2016 performance against our medium-term financial performance objectives:

2016 Financial performance compared to our medium-term objectives — Table 2

	2016 results
Diluted EPS growth of 7% +	**0.7%**
ROE of 18% +	**16.3%**
Strong capital ratios (CET1) (1)	**10.8%**
Dividend payout ratio 40% – 50%	**48%**

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

Both our diluted EPS and ROE were impacted by our acquisition of City National due to the issuance of RBC common shares, as noted below.

For 2017, we maintained our financial performance objectives relating to diluted EPS growth, strong capital ratios and dividend payout ratio. We have revised our ROE financial objective to 16%+ to reflect higher ongoing regulatory capital requirements and the impact related to the issuance of RBC common shares on the acquisition of City National.

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 annualized TSR vs. peer group average — Table 3

	Three year TSR (1)	Five year TSR (1)
Royal Bank of Canada	10%	16%
	Top half	Top half
Peer group average (excluding RBC)	8%	13%

(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, 2013 to October 31, 2016 and October 31, 2011 to October 31, 2016, respectively.

Common share and dividend information — Table 4

For the year ended October 31	2016	2015	2014	2013	2012
Common share price (RY on TSX) – close, end of period	**$ 83.80**	$ 74.77	$ 80.01	$ 70.02	$ 56.94
Dividends paid per share	**3.20**	3.04	2.76	2.46	2.22
Increase (decrease) in share price	**12.1%**	(6.5)%	14.3%	23.0%	17.1%
Total shareholder return	**16.8%**	(3.0)%	19.0%	28.0%	22.0%

Key corporate events of 2016

RBC General Insurance Company

On July 1, 2016, we completed the sale of RBC General Insurance Company to Aviva Canada Inc. (Aviva), which was previously announced on January 21, 2016. The transaction involved the sale of our home and auto insurance manufacturing business and included a 15-year strategic distribution agreement between RBC Insurance and Aviva. As a result of the transaction, we recorded a gain of $287 million ($235 million after-tax) in our 2016 results, which was recorded in Non-interest income – Other. For further details, refer to Note 11 of our 2016 Annual Consolidated Financial Statements.

City National Corporation

On November 2, 2015, we completed the acquisition of City National Corporation (City National), the holding company for City National Bank. Total consideration of $7.1 billion (US$5.5 billion) was paid with $3.4 billion (US$2.6 billion) in cash, 41.6 million RBC common shares and $360 million (US$275 million) of RBC first preferred shares. City National has been combined with the U.S. Wealth Management business within our Wealth Management segment. For further details, refer to Note 11 of our 2016 Annual Consolidated Financial Statements.

Financial performance

Overview

2016 vs. 2015

Net income of $10,458 million was up $432 million or 4% from a year ago. Diluted earnings per share (EPS) of $6.78 was up $0.05 and return on common equity (ROE) of 16.3% was down 230 bps from 18.6% last year. In 2016, both our diluted EPS and ROE were impacted by our acquisition of City National due to the issuance of RBC common shares as noted above. Our Common Equity Tier 1 (CET1) ratio was 10.8%, up 20 bps.

Our results were driven by higher earnings in Wealth Management, Insurance, Personal & Commercial Banking, and Investor & Treasury Services, partially offset by lower earnings in Capital Markets. Our results include the after-tax gain of $235 million on the sale of RBC General Insurance Company to Aviva and the favourable impact of foreign exchange translation. Results in 2015 included a gain of $108 million (before- and after-tax) from the wind-up of a U.S.-based subsidiary that resulted in the release of foreign currency translation adjustment (CTA) which was recorded in Corporate Support.

Wealth Management earnings increased primarily reflecting the inclusion of our acquisition of City National, which contributed $290 million to earnings, lower restructuring costs relating to the International Wealth Management business, and benefits from our efficiency management activities. These factors were partially offset by lower transaction volumes.

Insurance earnings increased largely due to the gain on the sale of RBC General Insurance Company, as noted above. Lower earnings from new U.K. annuity contracts and the reduction in earnings from the sale of our home and auto insurance manufacturing business, as noted above, were partially offset by growth in International Insurance.

Personal & Commercial Banking earnings increased largely reflecting solid volume and fee-based revenue growth across most businesses in Canada, and higher earnings in the Caribbean. These factors were partially offset by lower spreads, higher costs in support of business growth and higher PCL in Canada.

Investor & Treasury Services earnings increased primarily due to higher funding and liquidity earnings reflecting tightening credit spreads and favourable interest rate movements, and higher client deposit spreads. These factors were partially offset by increased investment in technology initiatives, higher staff costs and lower earnings from foreign exchange market execution. In addition, the prior year included an additional month of earnings in Investor Services of $42 million ($28 million after-tax).

Capital Markets earnings decreased largely driven by higher PCL, lower results in our Global Markets and Corporate and Investment Banking businesses reflecting lower client activity, and higher compliance costs. These factors were partially offset by lower variable compensation, the impact from foreign exchange translation, and lower litigation provisions.

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

2015 vs. 2014

In 2015, net income of $10,026 million was up $1,022 million or 11% from 2014. Diluted EPS of $6.73 was up $0.73 and ROE of 18.6% was down 40 bps. Our CET1 ratio was 10.6%, up 70 bps.

Our results were driven by higher earnings in Personal & Commercial Banking, Capital Markets and Investor & Treasury Services, partially offset by lower earnings in Insurance and Wealth Management. Our results were also favourably impacted by a lower effective tax rate reflecting favourable income tax adjustments, the positive impact of foreign exchange translation, and a gain of $108 million (before- and after-tax) from the wind-up of a U.S.-based funding subsidiary as noted above. In addition, results in 2014 included a loss of $100 million (before- and after-tax) related to the sale of RBC Royal Bank (Jamaica) Limited (RBC Jamaica) and a provision of $40 million ($32 million after-tax) related to post-employment benefits and restructuring charges in the Caribbean.

Personal & Commercial Banking earnings mainly reflected solid volume growth across most businesses in Canada, strong fee-based revenue growth, and higher earnings in the Caribbean, partially offset by higher costs to support business growth and lower spreads.

Capital Markets earnings were driven by growth in our Global Markets business mainly reflecting increased client activity, continued solid performance in our Corporate and Investment Banking business, and the impact from foreign exchange translation, partially offset by lower results in certain legacy portfolios.

Investor & Treasury Services earnings mainly reflected higher earnings from foreign exchange market execution, an additional month of earnings in Investor Services of $42 million ($28 million after-tax), increased custodial fees, and higher earnings from growth in client deposits. These factors were partially offset by lower funding and liquidity results.

Insurance results decreased mainly due to a change in Canadian tax legislation impacting certain foreign affiliates which became effective November 1, 2014, a lower level of favourable actuarial adjustments, and higher net claims costs. These factors were partially offset by higher earnings from new U.K. annuity contracts, and a favourable impact of investment-related activities on the Canadian life business.

Wealth Management earnings decreased primarily reflecting higher costs in support of business growth in our Global Asset Management and Canadian Wealth Management businesses, restructuring costs of $122 million ($90 million after-tax) largely related to our International Wealth Management business, lower transaction volumes and higher PCL. These factors were partly offset by higher earnings from growth in average fee-based client assets.

Impact of foreign currency translation

Our foreign currency-denominated results are impacted by exchange rate fluctuations. Revenue, PCL, insurance policyholder benefits, claims and acquisition expense (PBCAE), non-interest expense and net income denominated in foreign currency are translated at the average rate of exchange for the period.

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

Table 5

(Millions of Canadian dollars, except per share amounts)	2016 vs. 2015	2015 vs. 2014
Increase (decrease):		
Total revenue	**$ 338**	**$ 1,012**
PCL	**20**	**11**
PBCAE	**(39)**	**75**
Non-interest expense	**165**	**652**
Income taxes	**64**	**113**
Net income	**128**	**161**
Impact on EPS		
Basic	**$ 0.09**	**$ 0.11**
Diluted	**0.09**	**0.11**

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

Table 6

(Average foreign currency equivalent of C$1.00) (1)	2016	2015	2014
U.S. dollar	**0.755**	0.797	0.914
British pound	**0.544**	0.519	0.551
Euro	**0.683**	0.707	0.680

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

Total revenue

Table 7

(Millions of Canadian dollars, except percentage amounts)	2016	2015	2014
Interest income	**$ 24,452**	$ 22,729	$ 22,019
Interest expense	**7,921**	7,958	7,903
Net interest income	**$ 16,531**	$ 14,771	$ 14,116
Net interest margin (on average earning assets)	**1.70%**	1.71%	1.86%
Investments (1)	**$ 8,556**	$ 8,095	$ 7,355
Insurance (2)	**4,868**	4,436	4,957
Trading (see additional trading information section)	**701**	552	742
Banking (3)	**4,848**	4,388	4,090
Underwriting and other advisory	**1,876**	1,885	1,809
Other (4)	**1,025**	1,194	1,039
Non-interest income	**$ 21,874**	$ 20,550	$ 19,992
Total revenue	**$ 38,405**	$ 35,321	$ 34,108

(1) Includes securities brokerage commissions, investment management and custodial fees, and mutual fund revenue.
(2) Includes premiums and investment and fee income. Investment income includes the change in fair value of investments backing policyholder liabilities and is largely offset in PBCAE.
(3) Includes service charges, foreign exchange revenue other than trading, card service revenue and credit fees.
(4) Includes other non-interest income, net gain (loss) on available-for-sale (AFS) securities and share of profit in joint ventures and associates.

2016 vs. 2015

Total revenue increased $3,084 million or 9% from last year. The impact of foreign exchange translation this year increased our total revenue by $338 million.

Net interest income increased $1,760 million or 12%, mainly due to the inclusion of our acquisition of City National, and volume growth of 6% across most of our businesses in Canadian Banking.

Net interest margin was down 1 bp compared to last year, largely due to the continued low interest rate environment and competitive pressures.

Investments revenue increased $461 million or 6%, mainly due to the inclusion of our acquisition of City National and higher average fee-based client assets reflecting net sales and capital appreciation. These factors were partially offset by lower transaction volumes.

Insurance revenue increased $432 million or 10%, mainly reflecting the change in fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, largely offset in PBCAE. This was partially offset by lower premiums reflecting the impact of the sale of our home and auto insurance manufacturing business.

Banking revenue increased $460 million or 10% mainly due to the change in fair value of certain Canadian dollar-denominated available-for-sale (AFS) securities that were funded with U.S. dollar-denominated deposits which is offset in Other revenue, and increased client activity.

Underwriting and other advisory revenue decreased $9 million, largely reflecting lower debt and equity origination activity and decreased loan syndication revenue largely in the U.S. These factors were mostly offset by increased M&A activity and the impact from foreign exchange translation.

Other revenue decreased $169 million or 14% from last year mainly due to the change in fair value of certain derivatives used to economically hedge the AFS securities as noted above, partially offset by the gain related to the sale of RBC General Insurance Company.

2015 vs. 2014
Total revenue in 2015 increased $1,213 million or 4% as compared to 2014, primarily due to the impact from foreign exchange translation which increased revenue by $1,012 million, growth in average fee-based client assets in Wealth Management resulting from capital appreciation and net sales, solid volume growth across most of our businesses in Canadian Banking, and higher fee-based revenue primarily attributable to strong mutual funds distribution fees in Canadian Banking reflecting higher average client fee-based assets. Higher debt origination reflecting increased client issuance activity, strong growth in M&A activity reflecting increased mandates in the U.S. and Europe, higher trading-related net interest income and solid lending growth in Capital Markets as well as a gain of $108 million from the wind-up of a U.S.-based funding subsidiary also contributed to the increase. These factors were partially offset by the negative change in fair value of investments backing our policyholder liabilities of $463 million resulting from an increase in long-term interest rates, and a reduction of revenue related to our retrocession contracts, both of which were largely offset in PBCAE.

Additional trading information

Table 8

(Millions of Canadian dollars)	2016	2015	2014
Total trading revenue (1)			
Net interest income	**$ 2,376**	$ 2,398	$ 2,029
Non-interest income	**701**	552	742
Total trading revenue	**$ 3,077**	$ 2,950	$ 2,771
Total trading revenue by product			
Interest rate and credit	**$ 1,804**	$ 1,400	$ 1,560
Equities	**684**	1,045	814
Foreign exchange and commodities	**589**	505	397
Total trading revenue	**$ 3,077**	$ 2,950	$ 2,771
Trading revenue (teb) by product			
Interest rate and credit	**$ 1,804**	$ 1,400	$ 1,560
Equities	**1,166**	1,614	1,305
Foreign exchange and commodities	**590**	504	397
Total trading revenue (teb)	**$ 3,560**	$ 3,518	$ 3,262
Trading revenue (teb) by product – Capital Markets			
Interest rate and credit	**$ 1,473**	$ 1,238	$ 1,293
Equities	**1,205**	1,590	1,244
Foreign exchange and commodities	**402**	376	333
Total Capital Markets trading revenue (teb)	**$ 3,080**	$ 3,204	$ 2,870

(1) Includes a gain of $49 million (2015 – $40 million gain; 2014 – $105 million loss) related to a funding valuation adjustment on uncollateralized OTC derivatives.

2016 vs. 2015
Total trading revenue of $3,077 million, which comprises trading-related revenue recorded in Net interest income and Non-interest income, was up $127 million, or 4% including the impact from foreign exchange translation, mainly due to higher fixed income and foreign exchange trading revenue mainly in Europe and Canada. These factors were partially offset by lower equities trading revenue reflecting lower client activity.

2015 vs. 2014
Total trading revenue in 2015 of $2,950 million, which comprises trading-related revenue recorded in Net interest income and Non-interest income, was up $179 million, or 6% compared to 2014 including the impact from foreign exchange translation, mainly due to higher equities trading revenue reflecting increased client activity primarily in the first half of 2015. This factor was partially offset by lower revenue in certain legacy portfolios including the exit from certain proprietary trading strategies in 2014 to comply with the Volcker Rule, and lower fixed income trading revenue reflecting challenging market conditions in the second half of 2015. In addition, trading revenue in 2014 was unfavourably impacted by the implementation of funding valuation adjustments.

Provision for credit losses (PCL)

2016 vs. 2015
Total PCL increased $449 million or 41% from a year ago, mainly due to higher PCL in Capital Markets, Personal & Commercial Banking, and a $50 million increase in PCL for loans not yet identified as impaired reflecting volume growth and ongoing economic uncertainty. The PCL ratio of 29 bps increased 5 bps.

2015 vs. 2014
Total PCL in 2015 decreased $67 million or 6% as compared to 2014, mainly due to lower PCL in Personal & Commercial Banking, partially offset by higher PCL in Capital Markets and Wealth Management.

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

Insurance policyholder benefits, claims and acquisition expense

2016 vs. 2015
PBCAE increased $461 million or 16% from a year ago, mainly due to a change in the fair value of investments backing our policyholder liabilities, which was largely offset in revenue. This factor was partially offset by lower claims reflecting the impact from the sale of our home and auto insurance manufacturing business.

2015 vs. 2014

PBCAE in 2015 decreased $610 million or 17% from 2014, mainly due to a reduction of PBCAE related to our retrocession contracts, and the change in fair value of investments backing our policyholder liabilities resulting from the change in long-term interest rates, both of which were largely offset in revenue. These factors were partially offset by business growth in Canadian and International Insurance, a lower level of favourable actuarial adjustments in 2015 reflecting management actions and assumption changes, and an increase due to the impact of foreign exchange translation.

Non-interest expense

Table 9

(Millions of Canadian dollars, except percentage amounts)	**2016**	2015	2014
Salaries	**$ 5,865**	$ 5,197	$ 4,834
Variable compensation	**4,407**	4,533	4,388
Benefits and retention compensation	**1,674**	1,607	1,561
Share-based compensation	**255**	246	248
Human resources	**$ 12,201**	$ 11,583	$ 11,031
Equipment	**1,438**	1,277	1,147
Occupancy	**1,568**	1,410	1,330
Communications	**945**	888	847
Professional fees	**1,078**	932	763
Amortization of other intangibles	**970**	712	666
Other	**1,936**	1,836	1,877
Non-interest expense	**$ 20,136**	$ 18,638	$ 17,661
Efficiency ratio (1)	**52.4%**	52.8%	51.8%

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

2016 vs. 2015

Non-interest expense increased $1,498 million or 8%, due to the inclusion of City National, which increased non-interest expense $1,648 million, and included $196 million related to the amortization of intangibles, and $91 million related to integration costs. Lower variable compensation, largely due to changes in the deferral policy of the compensation plan in Capital Markets, continuing benefits from our efficiency management activities, lower restructuring costs relating to the International Wealth Management business, and lower litigation provisions in Capital Markets were partially offset by higher costs in support of business growth, the impact from foreign exchange translation of $165 million, increased investment in technology initiatives and higher compliance costs.

Our efficiency ratio of 52.4% decreased 40 bps from 52.8% last year, mainly reflecting the increase in revenue due to the change in fair value of investments backing our policyholder liabilities, which was largely offset in PBCAE, continuing benefits from our efficiency management activities, and the gain on sale of RBC General Insurance Company. These factors were partially offset by the inclusion of our acquisition of City National.

2015 vs. 2014

Non-interest expense in 2015 increased $977 million or 6% compared to 2014, mainly reflecting the impact from foreign exchange translation of $652 million and higher costs in support of business growth. Restructuring costs of $122 million ($90 million after-tax) largely related to our International Wealth Management business also contributed to the increase. These factors were partially offset by lower litigation provisions and related legal costs in Capital Markets, and continuing benefits from our efficiency management activities. Non-interest expense in 2014 included the loss of $100 million related to the sale of RBC Jamaica and a provision of $40 million related to post-employment benefits and restructuring charges in the Caribbean.

Our efficiency ratio of 52.8% increased 100 bps from 51.8% in 2014, mainly reflecting the decrease in revenue due to the change in fair value of investments backing our policyholder liabilities, and higher costs in support of business growth, partially offset by continuing benefits from our efficiency management activities.

Income and other taxes

Table 10

(Millions of Canadian dollars, except percentage amounts)	2016	2015	2014
Income taxes	**$ 2,841**	$ 2,597	$ 2,706
Other taxes			
Goods and services sales taxes	**$ 442**	$ 426	$ 395
Payroll taxes	**627**	577	529
Capital taxes	**106**	100	86
Property taxes	**134**	121	106
Insurance premium taxes	**45**	50	51
Business taxes	**69**	59	8
	$ 1,423	$ 1,333	$ 1,175
Total income and other taxes	**$ 4,264**	$ 3,930	$ 3,881
Income before income taxes	**$ 13,299**	$ 12,623	$ 11,710
Canadian statutory income tax rate (1)	**26.5%**	26.3%	26.3%
Lower average tax rate applicable to subsidiaries	**(2.6)%**	(0.9)%	(2.3)%
Tax-exempt income from securities	**(3.1)%**	(3.6)%	(3.3)%
Tax rate change	**–%**	0.3%	–%
Effect of previously unrecognized tax loss, tax credit or temporary differences	**(0.4)%**	(0.1)%	(0.1)%
Other	**1.0%**	(1.4)%	2.5%
Effective income tax rate	**21.4%**	20.6%	23.1%
Effective total tax rate (2)	**29.0%**	28.2%	30.1%

(1) Blended Federal and Provincial statutory income tax rate.
(2) Total income and other taxes as a percentage of net income before income taxes and other taxes.

2016 vs. 2015

Income tax expense increased $244 million or 9% from last year, mainly due to higher earnings before income tax. The effective tax rate of 21.4% increased 80 basis points as last year included net favourable tax adjustments.

Other taxes increased $90 million or 7% from 2015 mainly due to higher payroll resulting from the inclusion of our acquisition of City National. In addition to the income and other taxes reported in our Consolidated Statements of Income, we recorded income tax recoveries of $438 million (2015 – $878 million) in shareholders' equity, primarily reflecting remeasurements of employee benefit plans.

2015 vs. 2014

Income tax expense decreased $109 million or 4% and the effective income tax rate of 20.6% decreased 250 bps from 2014, mainly due to net favourable tax adjustments in 2015, partially offset by higher earnings before income taxes.

Other taxes increased $158 million or 13% from 2014, mainly due to higher business and payroll taxes, as well as higher goods and services sales taxes.

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, 2016, followed by our Wealth Management business with approximately 17% of total AUA.

2016 vs. 2015

AUA increased $376 billion or 8% compared to last year, mainly reflecting capital appreciation, net sales, the impact from foreign exchange translation and the inclusion of our acquisition of City National.

The following table summarizes AUA by geography and asset class:

AUA by geographic mix and asset class — Table 11

(Millions of Canadian dollars)	2016	2015
Canada (1)		
Money market	**$ 33,000**	$ 31,500
Fixed income	**731,200**	685,600
Equity	**705,900**	669,900
Multi-asset and other	**733,800**	642,400
Total Canada	**$ 2,203,900**	$ 2,029,400
U.S. (1), (2)		
Money market	**$ 36,400**	$ 32,900
Fixed income	**126,800**	114,600
Equity	**200,800**	189,300
Multi-asset and other	**44,800**	35,600
Total U.S.	**$ 408,800**	$ 372,400
Other International (1)		
Money market	**$ 50,300**	$ 47,500
Fixed income	**426,200**	375,400
Equity	**856,400**	804,000
Multi-asset and other	**1,113,300**	1,054,400
Total International	**$ 2,446,200**	$ 2,281,300
Total AUA (2)	**$ 5,058,900**	$ 4,683,100

(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 include administrative services. Management fees may be calculated daily, monthly or quarterly as a percentage of the AUM, depending on the distribution channel, underlying products 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 also include performance fee arrangements, which 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 that has AUM.

2016 vs. 2015
AUM increased $88 billion or 18% compared to last year, primarily due to the inclusion of our acquisition of City National and capital appreciation.

The following table presents the change in AUM for the year ended October 31, 2016:

Client assets – AUM — Table 12

	2016					2015
(Millions of Canadian dollars)	**Money market**	**Fixed income**	**Equity**	**Multi-asset and other**	**Total**	
AUM, beginning balance	**$ 39,800**	**$ 196,300**	**$ 83,600**	**$ 178,700**	**$ 498,400**	$ 457,000
Institutional inflows	**11,200**	**35,800**	**4,800**	**3,400**	**55,200**	n.a.
Institutional outflows	**(14,400)**	**(52,000)**	**(3,900)**	**(1,800)**	**(72,100)**	n.a.
Personal flows, net	**700**	**4,300**	**500**	**16,100**	**21,600**	n.a.
Total net flows	**(2,500)**	**(11,900)**	**1,400**	**17,700**	**4,700**	18,200
Market impact	**200**	**8,100**	**5,100**	**8,100**	**21,500**	n.a.
Acquisition	**9,800**	**4,200**	**10,200**	**33,900**	**58,100**	n.a.
Foreign exchange	**600**	**2,000**	**500**	**500**	**3,600**	n.a.
Total market, acquisition and foreign exchange impact	**10,600**	**14,300**	**15,800**	**42,500**	**83,200**	23,200
AUM, balance at end of year	**$ 47,900**	**$ 198,700**	**$ 100,800**	**$ 238,900**	**$ 586,300**	$ 498,400

n.a. not available

Business segment results

Results by business segment

Table 13

(Millions of Canadian dollars, except percentage amounts)	2016 Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets (1)	Corporate Support (1)	2016 Total	2015 Total	2014 Total
Net interest income	$ 10,337	$ 1,955	$ –	$ 825	$ 3,804	$ (390)	$ 16,531	$ 14,771	$ 14,116
Non-interest income	4,499	6,834	5,151	1,446	4,146	(202)	21,874	20,550	19,992
Total revenue	$ 14,836	$ 8,789	$ 5,151	$ 2,271	$ 7,950	$ (592)	$ 38,405	$ 35,321	$ 34,108
PCL	1,122	48	1	(3)	327	51	1,546	1,097	1,164
PBCAE	–	–	3,424	–	–	–	3,424	2,963	3,573
Non-interest expense	6,757	6,801	622	1,460	4,466	30	20,136	18,638	17,661
Net income before income taxes	$ 6,957	$ 1,940	$ 1,104	$ 814	$ 3,157	$ (673)	$ 13,299	$ 12,623	$ 11,710
Income tax	1,773	467	204	201	887	(691)	2,841	2,597	2,706
Net income	$ 5,184	$ 1,473	$ 900	$ 613	$ 2,270	$ 18	$ 10,458	$ 10,026	$ 9,004
ROE (2)	27.5%	10.9%	52.8%	17.9%	12.2%	n.m.	16.3%	18.6%	19.0%
Average assets	$ 403,800	$ 83,200	$ 14,400	$ 142,500	$ 508,200	$ 24,300	$ 1,176,400	$ 1,052,800	$ 906,500

(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) These measures 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.

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. The following highlights the key aspects of how 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, including residual asset/liability management results, impact from income tax adjustments, net charges associated with unattributed capital and PCL on loans not yet identified as impaired.

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.

Capital attribution

Our 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 segments. 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, as well as losses that have been incurred but are not yet identified in our loans portfolio. This 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 2016 Annual Consolidated Financial Statements.

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 and risk 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 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:

Calculation of ROE — **Table 14**

(Millions of Canadian dollars, except percentage amounts)	2016 Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Corporate Support	2016 Total	2015 Total	2014 Total
Net income available to common shareholders	**$ 5,089**	**$ 1,412**	**$ 891**	**$ 596**	**$ 2,186**	**$ (63)**	**$ 10,111**	$ 9,734	$ 8,697
Total average common equity (1), (2)	**18,550**	**12,950**	**1,700**	**3,350**	**17,900**	**7,750**	**62,200**	52,300	45,700
ROE (3)	**27.5%**	**10.9%**	**52.8%**	**17.9%**	**12.2%**	**n.m.**	**16.3%**	18.6%	19.0%

(1) Average common equity represents rounded figures.
(2) The amounts for the segments are referred to as attributed capital. Effective the first quarter of 2016, 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 present value 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, 2016 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 shareholder's equity, thus enabling users to identify relative contributions to shareholder value.

The capital charge includes a charge for common equity and preferred shares. For 2016, our cost of common equity remained unchanged at 9.0%.

The following table provides a summary of our Economic profit:

Economic profit **Table 15**

(Millions of Canadian dollars)	2016 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
Goodwill and intangibles write-down	–	–	–	–	–	–	–
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

(Millions of Canadian dollars)	2015 Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Corporate Support	Total	2014 Total
Net income	$ 5,006	$ 1,041	$ 706	$ 556	$ 2,319	$ 398	$ 10,026	$ 9,004
add: Non-controlling interests	(8)	2	–	(1)	–	(94)	(101)	(94)
After-tax effect of amortization of other intangibles	22	69	–	21	–	1	113	123
Goodwill and intangibles write-down	–	4	–	–	–	–	4	8
Adjusted net income (loss)	$ 5,020	$ 1,116	$ 706	$ 576	$ 2,319	$ 305	$ 10,042	$ 9,041
less: Capital charge	1,544	551	148	251	1,550	852	4,896	4,341
Economic profit (loss)	$ 3,476	$ 565	$ 558	$ 325	$ 769	$ (547)	$ 5,146	$ 4,700

Results excluding specified items

Our results were impacted by the following specified items:

- For the year ended October 31, 2016, a gain of $287 million ($235 million after-tax) recorded in our Insurance segment, related to the sale of RBC General Insurance Company to Aviva Canada Inc., which involved the sale of our home and auto insurance manufacturing business.
- For the year ended October 31, 2014, in our Personal & Commercial Banking segment:
  - A total loss of $100 million (before- and after-tax) related to the sale of RBC Jamaica, comprised of a loss of $60 million (before- and after-tax) in the first quarter of 2014, and a further loss of $40 million (before- and after-tax) in the third quarter of 2014 which includes foreign currency translation related to the closing of the sale of RBC Jamaica; and
  - A provision of $40 million ($32 million after-tax) related to post-employment benefits and restructuring charges in the Caribbean.

The following tables provide calculations of our business segment results and measures excluding these specified items for the years ended October 31, 2016 and October 31, 2014.

Insurance **Table 16**

(Millions of Canadian dollars, except percentage amounts)	2016 As reported	Item excluded: Gain related to the sale of RBC General Insurance	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
Selected balance and other information			
ROE	52.8%		41.0%

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

Personal & Commercial Banking **Table 17**

(Millions of Canadian dollars, except percentage amounts)	2014			
		Items excluded		
	As reported	Loss related to the sale of RBC Jamaica (1)	Provision for post-employment benefits and restructuring charges	Adjusted
Total revenue	$ 13,730	$ –	$ –	$ 13,730
PCL	1,103	–	–	1,103
Non-interest expense	6,563	(100)	(40)	6,423
Net income before taxes	6,064	100	40	6,204
Net income	$ 4,475	$ 100	$ 32	$ 4,607
Selected balances and other information				
Non-interest expense	$ 6,563	$ (100)	$ (40)	$ 6,423
Total revenue	13,730			13,730
Efficiency ratio	47.8%			46.8%
Revenue growth rate	5.5%			5.5%
Non-interest expense growth rate	6.4%			4.2%
Operating leverage	(0.9%)			1.3%

(1) Total loss is comprised of a loss of $60 million (before- and after-tax) recorded in Q1 2014 and a further loss of $40 million (before- and after-tax) in Q3 2014, including foreign currency translation.

Personal & Commercial Banking

Operating through two businesses – Canadian Banking and Caribbean & U.S. Banking, Personal & Commercial Banking is comprised of our personal and business banking operations, and our auto financing and retail investment businesses, including our online discount brokerage channel. We provide services to more than 13.5 million individual, business and institutional clients across Canada, the Caribbean and the U.S. In Canada, we provide a broad suite of financial products and services through our extensive branch, automated teller machine (ATM), online, mobile and telephone banking networks, as well as through a large number of proprietary sales professionals. In the Caribbean, we offer a broad range of financial products and services to individuals and business clients, and public institutions in targeted markets. In the U.S., we serve the cross-border banking needs of Canadian clients within the U.S. through online channels.

In Canada, we compete with other Schedule I banks, independent trust companies, foreign banks, credit unions, caisses populaires and auto financing companies. We maintain top (#1 or #2) rankings in market share in this competitive environment for all key retail and business financial product categories, and have the largest branch network, the most ATMs and the largest mobile sales network across Canada. In the Caribbean, our competition includes banks, trust companies and investment management companies serving retail and corporate customers and public institutions. We continue to be the second-largest bank as measured by assets in the English Caribbean, with 77 branches in 17 countries and territories. In the U.S., we compete primarily with other Canadian banking institutions with operations in the U.S.

Economic and market review

We continued to see solid volume growth across most of our Canadian Banking businesses despite challenging economic conditions in Canada, particularly in the oil exposed regions. Overall, credit conditions have weakened from historically strong levels last year primarily due to higher unemployment in oil exposed provinces, while credit conditions remained relatively stable in other provinces. Our businesses continued to be impacted by competitive pressures and the low interest rate environment. In the Caribbean, unfavourable economic conditions continued to negatively impact our results through lower loan volume growth, and spread compression.

Highlights

In Canada:

- We achieved solid volume growth across most products with particular strengths in:
  - Home equity supported by our focus on the key newcomer and first time home buyer segments, coupled with our Employee Pricing campaigns;
  - Credit cards through strong account and balance growth in our industry leading Avion ® card;
  - Personal and business deposits through acquisition of new clients and strengthening our existing client relationships;
  - Business lending through higher focus on select business segments and markets to strengthen our market share; and
  - Mutual fund branch investments through strong net inflows and capital appreciation strengthening our leading market share position.
- Became the first Canadian bank to offer free Interac e-Transfer payments for all personal chequing accounts.
- We currently service 5.2 million active clients through our online and mobile platforms, and continued to invest in digitizing our client experience with a focus on speed of service and simplifying end-to-end processes:
  - First North American financial institution to provide an in-branch, real-time, multi-language video capability available in more than 200 languages;
  - Implemented “Disbursement Hub”, a new automated system that reduces the time it takes to provide funds to our mortgage clients upon closing, and connects all transaction stakeholders, including lawyers and notaries;
  - Launched “Add It”, whereby pre-approved clients can set up their Royal Credit Line ® with just four clicks, and without the need for paperwork or a branch visit;
  - Rolled out Touch ID Login (iPhone) and our iWatch app release providing more options for our clients to bank securely with us anywhere, anytime; and
  - Launched contactless point-of-sale at participating merchants by making Apple Pay ‡ available to RBC debit and credit cardholders.
- As a result of our successes, we received external recognition as an industry leader and were named or ranked:
  - Highest in Customer Satisfaction among the Big Five Retail Banks in Canada 2016 (*J.D. Power*)
  - World’s Best Global Bank for Consumer Banking; Best Trade Finance Bank in Canada 4 years in a row (*Global Finance*)
  - Best Payment Innovation and Best Use of Data Analytics for 2016 (*Retail Banker International*)

In the Caribbean:
- Improving our client experience through transformation of our branches, upgrade of our ATM network, rollout of the new mobile banking app and investment in specialized sales force capabilities.
- Continued to focus on quality asset growth in key client segments while reducing structural costs.
- As a result of our successes, we were named #1 Bank in the Caribbean for the second year in a row (*The Banker*).

Outlook and priorities

The Canadian economy is expected to grow by 1.8% in calendar 2017, driven by firm consumer spending, recovery in business investments and stable to improving unemployment rates. However, with risks remaining to the economic outlook, interest rates are expected to stay at their current low levels throughout 2017, underpinning solid volume growth for certain lending products. In addition, though the recent regulatory measures taken by Federal and Provincial governments to curb the pace of housing market growth in certain regions is expected to affect the demand for mortgage products, the continued low interest rate environment is expected to remain supportive of solid mortgage volume growth. As the low interest rate environment has resulted in compressed interest margins for industry participants, we continue to expect competitive pressures in the coming year. In 2017, we will continue to focus on building a digitally-enabled relationship bank and improving the client experience to successfully attract and retain new and existing clients.

In the Caribbean, challenging market conditions and slow economic growth continue to temper our outlook for 2017. We expect net interest margins to remain challenged primarily due to competitive pressures. However, we expect to strengthen our business performance through efficiency management, increases in fee revenue and quality asset growth.

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

Key strategic priorities for 2017

In Canada, our priorities are to:
- Transform how we serve clients by increasing points of access to our digital platforms and services and providing our clients with personalized advice and solutions, offers and client loyalty rewards.
- Accelerate growth in key segments and increase our presence in underpenetrated areas to achieve industry-leading volume growth.
- Rapidly deliver digital solutions to our clients.
- Innovate to become a more agile and efficient bank and accelerate our investments to simplify, digitize and automate for clients and employees.

In the Caribbean, we are focused on transforming our distribution channels to better serve our clients in target markets where we can compete and drive sustainable profitability, with a strategic focus on corporate, business, professional and business owner clientele. In the U.S., we are focused on meeting the banking and borrowing needs of our cross-border clients through an innovative direct banking approach by providing seamless access to their entire suite of RBC products.

Personal & Commercial Banking — Table 18

(Millions of Canadian dollars, except number of and percentage amounts and as otherwise noted)	**2016**	2015	2014
Net interest income	**$ 10,337**	$ 10,004	$ 9,743
Non-interest income	**4,499**	4,309	3,987
Total revenue	**14,836**	14,313	13,730
PCL	**1,122**	984	1,103
Non-interest expense	**6,757**	6,611	6,563
Net income before income taxes	**6,957**	6,718	6,064
Net income	**$ 5,184**	$ 5,006	$ 4,475
Revenue by business			
Canadian Banking	**$ 13,833**	$ 13,379	$ 12,869
Caribbean & U.S. Banking	**1,003**	934	861
Key ratios			
ROE	**27.5%**	30.0%	29.0%
NIM (1)	**2.68%**	2.71%	2.77%
Efficiency ratio (2)	**45.5%**	46.2%	47.8%
Efficiency ratio adjusted (2), (3)	**n.a.**	n.a.	46.8%
Operating leverage	**1.5%**	3.5%	(0.9)%
Operating leverage adjusted (3)	**n.a.**	1.3%	1.3%
Selected average balance sheet information			
Total assets	**$ 403,800**	$ 386,100	$ 367,900
Total earning assets	**385,400**	369,000	351,300
Loans and acceptances	**383,900**	367,500	350,700
Deposits	**320,100**	298,600	278,800
Other information			
AUA (4)	**$ 239,600**	$ 223,500	$ 214,200
AUM	**4,600**	4,800	4,000
Number of employees (FTE) (5)	**33,896**	35,211	36,315
Effective income tax rate	**25.5%**	25.5%	26.2%
Credit information			
Gross impaired loans as a % of average net loans and acceptances	**0.43%**	0.49%	0.55%
PCL on impaired loans as a % of average net loans and acceptances	**0.29%**	0.27%	0.31%

(1) NIM is calculated as Net interest income divided by Average total earning assets.
(2) Efficiency ratio is calculated as Non-interest expense divided by Total revenue.
(3) Measures have been adjusted by excluding the Q3 2014 loss of $40 million related to the closing of RBC Jamaica, and the Q1 2014 loss of $60 million related to the sale of RBC Jamaica and the provision of $40 million related to post-employment benefits and restructuring charges in the Caribbean. These are non-GAAP measures. For further details, refer to the Key performance and non-GAAP measures section.
(4) AUA represents period-end spot balances and includes securitized residential mortgages and credit card loans as at October 31, 2016 of $18.6 billion and $9.6 billion, respectively (October 31, 2015 – $21.0 billion and $8.0 billion; October 31, 2014 – $23.2 billion and $8.0 billion).
(5) Amounts have been revised from those previously presented.
n.a. not applicable

Financial performance

2016 vs. 2015

Net income increased $178 million or 4%, largely reflecting solid volume growth across most businesses partially offset by lower spreads and fee-based revenue growth in Canadian Banking. Higher earnings in the Caribbean also contributed to the increase. These factors were partially offset by higher costs in support of business growth and higher PCL in Canada.

Total revenue increased $523 million or 4% largely reflecting volume growth of 6% partly offset by lower spreads in Canada and higher fee-based revenue.

Net interest margin decreased 3 bps mainly due to the low interest rate environment.

PCL increased $138 million, with the PCL ratio increasing 2 bps, largely due to higher provisions in our Canadian personal and commercial lending portfolios and higher write-offs in our Canadian credit cards portfolio. These factors were partially offset by lower PCL in our Caribbean portfolios.

Non-interest expense increased $146 million or 2%, primarily attributable to higher technology spend and increased costs in support of business growth. These factors were partially offset by continuing benefits from our efficiency management activities.

Average loans and acceptances increased $16 billion or 4%, largely due to growth in Canadian residential mortgages and business loans.

Average deposits increased $22 billion or 7%, as a result of growth in business and personal deposits.

2015 vs. 2014

Net income was up $531 million or 12% from 2014. Excluding the loss of $100 million (before- and after-tax) related to the sale of RBC Jamaica, and a provision of $40 million ($32 million after-tax) related to post-employment benefits and restructuring charges in the Caribbean in 2014, net income increased $399 million or 9%, largely reflecting solid volume growth across most businesses in Canada, higher fee-based revenue primarily attributable to higher mutual fund distribution fees reflecting higher average client fee-based assets, higher card service revenue, higher earnings in the Caribbean and lower PCL. These factors were partially offset by higher technology and staff costs to support business growth and lower spreads.

Results excluding the specified items noted above 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 19**

(Millions of Canadian dollars, except number of and percentage amounts and as otherwise noted)	**2016**	2015	2014
Net interest income	**$ 9,683**	$ 9,377	$ 9,168
Non-interest income	**4,150**	4,002	3,701
Total revenue	**13,833**	13,379	12,869
PCL	**1,080**	912	928
Non-interest expense	**6,010**	5,891	5,687
Net income before income taxes	**6,743**	6,576	6,254
Net income	**$ 5,002**	$ 4,877	$ 4,642
Revenue by business			
Personal Financial Services	**$ 7,810**	$ 7,634	$ 7,285
Business Financial Services	**3,190**	3,091	3,135
Cards and Payment Solutions	**2,833**	2,654	2,449
Key Ratios			
ROE	**32.6%**	36.4%	37.0%
NIM (1)	**2.63%**	2.66%	2.71%
Efficiency ratio (2)	**43.4%**	44.0%	44.2%
Operating leverage	**1.4%**	0.4%	1.2%
Selected average balance sheet information			
Total assets	**$ 381,000**	$ 364,900	$ 349,500
Total earning assets	**368,100**	352,800	337,900
Loans and acceptances	**374,600**	358,500	343,100
Deposits	**301,400**	281,200	263,600
Other information			
AUA (3)	**231,400**	213,700	205,200
Number of employees (FTE) (4)	**29,982**	31,057	31,583
Effective income tax rate	**25.8%**	25.8%	25.8%
Credit information			
Gross impaired loans as a % of average net loans and acceptances	**0.27%**	0.30%	0.33%
PCL on impaired loans as a % of average net loans and acceptances	**0.29%**	0.25%	0.27%

(1) NIM is calculated as Net interest income divided by Average total earning assets.
(2) Efficiency ratio is calculated as Non-interest expense divided by Total revenue.
(3) AUA represents period-end spot balances and includes securitized residential mortgages and credit card loans as at October 31, 2016 of $18.6 billion and $9.6 billion, respectively, (October 31, 2015 – $21.0 billion and $8.0 billion; October 31, 2014 – $23.2 billion and $8.0 billion).
(4) Amounts have been revised from those previously presented.

Financial performance

2016 vs. 2015

Net income increased $125 million or 3% largely reflecting solid volume growth across most businesses partially offset by lower spreads, and fee-based revenue growth. These factors were partially offset by higher PCL and higher costs in support of business growth.

Total revenue increased $454 million or 3%, largely reflecting volume growth of 6% partly offset by lower spreads. Fee-based revenue growth mainly from higher credit card balances and transaction volumes driving higher card service revenue, and increased client activity also contributed to the increase.

Net interest margin decreased 3 bps compared to last year mainly due to the low interest rate environment.

PCL increased $168 million, with the PCL ratio increasing 4 bps, mostly due to higher provisions in our personal and commercial lending portfolios and higher write-offs in our credit cards portfolio.

Non-interest expense increased $119 million or 2% mainly due to higher technology spend and increased costs in support of business growth. These factors were partially offset by continuing benefits from our efficiency management activities.

Average loans and acceptances increased $16 billion or 4%, mainly due to 7% average growth in residential mortgages and business loans.

Average deposits increased $20 billion or 7%, primarily reflecting growth in both business and personal deposits.

2015 vs. 2014

Net income increased $235 million or 5% from 2014, reflecting solid volume growth across most businesses, strong fee-based revenue growth primarily attributable to higher mutual fund distribution fees due to higher average client fee-based assets, as well as higher credit card balances and transaction volumes driving higher card service revenue. These factors were partially offset by higher technology and staff costs to support business growth, and lower spreads.

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 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 1,268 branches and over 4,550 ATMs.

Financial performance

Total revenue increased $176 million or 2% compared to last year, primarily reflecting volume growth of 7% in deposits and residential mortgages partially offset by lower spreads, and increased client activity.

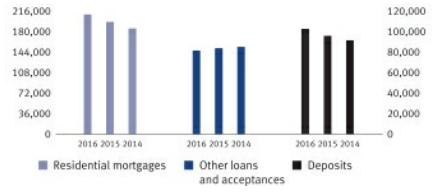
Average residential mortgages increased 7% compared to last year, resulting from solid housing market activity supported by the continuing low interest rate environment and our targeted marketing strategy. Average other loans and acceptances decreased 3% from last year largely due to lower indirect lending volumes. Average deposits increased 7% from last year largely reflecting the acquisition of new clients as well as continued growth of existing client balances. Strong client acquisition contributed to increased client activity and continued growth of average client fee-based assets.

Selected highlights — Table 20

(Millions of Canadian dollars, except number of)	2016	2015	2014
Total revenue	**$ 7,810**	$ 7,634	$ 7,285
Other information (average)			
Residential mortgages	**210,400**	197,300	186,000
Other loans and acceptances	**81,800**	84,100	85,400
Deposits (1)	**185,600**	173,000	165,100
Branch mutual fund balances (2)	**132,100**	122,000	111,600
AUA – Self-directed brokerage (2)	**69,700**	61,400	60,500
Number of:			
New deposit accounts opened (thousands)	**1,346**	1,420	1,514
Branches	**1,268**	1,275	1,272
ATM	**4,555**	4,542	4,620

(1) Includes GIC balances.
(2) 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 $99 million or 3% compared to last year primarily due to volume growth in both loans and deposits, which was partially offset by lower spreads reflecting the continuing low interest rate environment and competitive pressures.

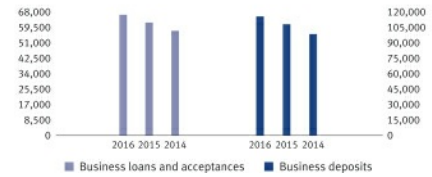
Average loans and acceptances increased 7% and average deposits were up 7%, despite a competitive environment, due to increased activity from existing and new clients.

Selected highlights — Table 21

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$ 3,190**	$ 3,091	$ 3,135
Other information (average)			
Loans and acceptances	**66,400**	62,000	57,600
Deposits (1)	**115,800**	108,200	98,500

(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 24% market share of Canada's credit card purchase volume.

In addition, this business line includes our 50% interest in Moneris Solutions, Inc., our merchant card processing joint venture with the Bank of Montreal. Moneris processes approximately $235 billion in annual credit and debit card transaction volumes.

Financial performance

Total revenue increased $179 million or 7% compared to last year, driven by higher credit card balances, increased transaction volumes, and improved spreads.

Average credit card balances increased 6% and net purchase volumes increased 7% due to higher client activity, including strong new account acquisition.

Selected highlights — Table 22

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$ 2,833**	$ 2,654	$ 2,449
Other information			
Average credit card balances	**16,000**	15,100	14,100
Net purchase volumes	**97,400**	90,800	84,200

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. through online and mobile channels, and offers a broad range of financial products and services to individual and business clients across all 50 states.

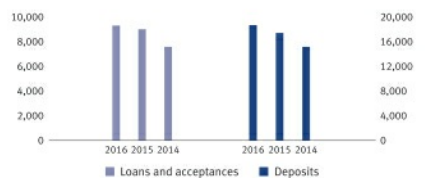
Financial performance
Total revenue was up $69 million or 7% from last year, primarily due to the positive impact of foreign exchange translation, higher fee-based revenue reflecting full service pricing in the Caribbean, and higher interest earned in our securities investment portfolio.

Average loans and acceptances increased 3%, and average deposits increased 7%, mostly due to the impact from foreign exchange translation.

Selected highlights — Table 23

(Millions of Canadian dollars, number of and percentage amounts)	2016	2015	2014
Total revenue	**$ 1,003**	$ 934	$ 861
Other information			
Net interest margin	**3.78%**	3.87%	4.29%
Average loans and acceptances	**$ 9,300**	$ 9,000	$ 7,600
Average deposits	**18,700**	17,400	15,200
AUA	**8,200**	9,800	9,000
AUM	**4,600**	4,800	4,000
Number of:			
Branches	**77**	79	93
ATM	**276**	274	309

Average loans and deposits (Millions of Canadian dollars)



Wealth Management

Wealth Management comprises Canadian Wealth Management, U.S. Wealth Management (including City National), International Wealth Management and Global Asset Management (GAM). Wealth Management serves individual and institutional clients in target markets around the world. From our offices in key financial centres mainly in Canada, the U.S., the U.K., the Channel Islands and Asia, Wealth Management offers a comprehensive suite of investment, trust, banking, credit and other wealth management solutions to affluent, high net worth (HNW) and ultra-high net worth (UHNW) clients. Our asset management group, Global Asset Management, which includes BlueBay Asset Management (BlueBay), is an established global leader in investment management services, providing investment strategies and fund solutions directly to institutional investors and also to individual clients through our distribution channels and third-party distributors. On November 2, 2015, we completed the acquisition of City National, which has enhanced and complemented our existing U.S. businesses and product offerings.

Economic and market review
Canada and the U.S. saw a softening in growth and economic performance in 2016, which resulted in a challenging market environment during the first half of 2016. In the latter part of the year, we saw improved investor confidence and market conditions driving growth in our average fee-based client assets through capital appreciation and higher net sales. The Eurozone continued to stimulate economic activity through the ECB's quantitative easing program. Globally, volatile capital markets have led to lower transactional volumes. Furthermore, increased regulatory requirements have had an adverse impact on compliance and technology costs.

Highlights
- The integration of City National has enhanced and complemented our presence in the U.S., further expanding our product offerings to select HNW clients, leveraging the combined platform for commercial clients, and continuing to extend industry verticals with RBC Capital Markets® expertise.
- We continue to grow and invest in our high-performing global asset management business and maintain leading market share of 14.8% in the Canadian mutual fund industry with strong positive net inflows. We continued to increase BlueBay's distribution footprint with institutional clients and expand our international distribution capabilities to the U.S. and international institutional clients and professional buyers.
- In Canada, our full service private wealth business is the industry leader. We continue to extend our leadership amongst HNW clients by focusing on delivering comprehensive value to our clients, leveraging our expertise around business owners, succession and wealth planning.
- In the U.S., we are among the top 10 full service brokerage firms in terms of assets under administration and number of advisors, and we continue to focus on improving advisor productivity. Furthermore, our recent acquisition of City National has enhanced our U.S. product offering.
- Outside Canada and the U.S., we continued to realign our International Wealth Management business to focus on key client segments, including HNW and UHNW clients in select target markets, while enhancing our product offering and operating environment to a more conservative risk profile.
- The strength of our global capabilities and continued commitment to deliver integrated global wealth management advice and solutions to HNW and UHNW clients has helped us earn significant industry awards. We were ranked or named:
  - Fifth largest global wealth manager by client assets (*Scorpio Partnership's 2016 Global Private Banking KPI Benchmark*) for the third year in a row.
  - Best Private Bank in Canada (PWM/ *The Banker* Global Private Banking Awards, 2016) for the fifth consecutive year.
  - Best Canadian Private Bank (Family Wealth Report Awards, 2016).

Outlook and priorities
With continued uncertainty in the major global economies, including Canada, low interest rates are expected to continue into 2017. Despite the overall economic uncertainty and volatile equity markets, we expect global private wealth 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 HNW and UHNW globally. In addition, changing demographics and rapid advancements in digitization are expected to drive change in client preferences, needs and service models, requiring a greater 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.

Key strategic priorities for 2017

- Focus on extending our leadership position in Canadian retail asset management (e.g., GAM penetration of Personal & Commercial Banking, Wealth Management and third-party channels) while expanding distribution to primarily U.S., U.K. and certain European institutional clients
- Drive profitable growth through continued acquisition and retention of HNW and UHNW clients in priority segments and markets, driven by a differentiated client experience that is increasingly digitally-enabled and supported by data-driven insights
- Continue to deepen client relationships in Canada jointly with our partners (e.g., Private Banking and Commercial Banking in Personal & Commercial Banking), and leverage the combined strengths of City National, RBC U.S. Wealth Management and Capital Markets to accelerate growth in the U.S.

Wealth Management — Table 24

(Millions of Canadian dollars, except number of and percentage amounts and as otherwise noted)	2016	2015	2014
Net interest income	**$ 1,955**	$ 493	$ 469
Non-interest income			
Fee-based revenue	**5,109**	4,699	4,185
Transactional and other revenue	**1,725**	1,583	1,659
Total revenue	**8,789**	6,775	6,313
PCL	**48**	46	19
Non-interest expense	**6,801**	5,292	4,800
Income before income taxes	**1,940**	1,437	1,494
Net income	**$ 1,473**	$ 1,041	$ 1,083
Revenue by business			
Canadian Wealth Management	**$ 2,450**	$ 2,308	$ 2,146
U.S. Wealth Management (including City National)	**4,123**	2,008	1,748
U.S. Wealth Management (including City National) (US$ millions)	**3,118**	1,603	1,599
International Wealth Management	**430**	639	722
Global Asset Management (1)	**1,786**	1,820	1,697
Key Ratios			
ROE	**10.9%**	17.4%	19.2%
NIM (2)	**2.84%**	2.50%	2.68%
Pre-tax margin (3)	**22.1%**	21.2%	23.7%
Selected average balance sheet information			
Total assets	**$ 83,200**	$ 29,100	$ 25,800
Loans and acceptances	**49,200**	17,700	15,700
Deposits	**85,400**	39,500	36,200
Attributed capital	**12,950**	5,900	5,500
Other information			
Revenue per advisor (000s) (4)	**$ 1,157**	$ 1,089	$ 983
AUA (5), (6)	**875,300**	823,700	781,400
AUM (5)	**580,700**	492,800	452,300
Average AUA (6)	**845,800**	826,700	711,700
Average AUM	**560,800**	484,700	427,800
Number of employees (FTE) (6)	**16,385**	12,325	12,636
Number of advisors (7)	**4,780**	3,954	4,245

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)	2016 vs. 2015
Increase (decrease):	
Total revenue	**$ 94**
Non-interest expense	**74**
Net income	**14**
Percentage change in average US$ equivalent of C$1.00	**(5)%**
Percentage change in average British pound equivalent of C$1.00	**5%**
Percentage change in average Euro equivalent of C$1.00	**(3)%**

(1) Effective the first quarter of 2014, we have aligned the reporting period of BlueBay, which resulted in an additional month of earnings being included in 2014.
(2) NIM is calculated as Net interest income divided by Average total earning assets.
(3) Pre-tax margin is defined as net income before income taxes divided by Total revenue.
(4) Represents investment advisors and financial consultants of our Canadian and U.S. full-service wealth businesses.
(5) Represents year-end spot balances.
(6) Amounts have been revised from those previously presented.
(7) Represents client-facing advisors across all our wealth management businesses.

Client assets – AUA — Table 25

(Millions of Canadian dollars)	2016	2015 (1)
AUA, beginning balance	**$ 823,700**	$ 781,400
Asset inflows	**251,000**	n.a.
Asset outflows	**(257,500)**	n.a.
Total net flows	**(6,500)**	(28,900)
Market impact	**31,100**	n.a.
Acquisitions	**17,800**	n.a.
Foreign exchange	**9,200**	n.a.
Total market, acquisition and foreign exchange impact	**58,100**	71,200
AUA, balance at end of year	**$ 875,300**	$ 823,700

(1) Amount has been revised from those previously presented.
n.a. not available

Client assets – AUM Table 26

(Millions of Canadian dollars)	2016 Money market	Fixed income	Equity	Multi-asset and other	Total	2015
AUM, beginning balance	$ 39,800	$ 194,300	$ 83,600	$ 175,100	$ 492,800	$ 452,300
Institutional inflows	11,300	35,300	4,800	3,300	54,700	n.a.
Institutional outflows	(14,400)	(51,500)	(3,900)	(1,800)	(71,600)	n.a.
Personal flows, net	700	4,300	500	16,000	21,500	n.a.
Total net flows	(2,400)	(11,900)	1,400	17,500	4,600	18,200
Market impact	200	8,200	5,100	8,100	21,600	n.a.
Acquisition	9,800	4,200	10,200	33,900	58,100	n.a.
Foreign exchange	600	2,000	500	500	3,600	n.a.
Total market, acquisition and foreign exchange impact	10,600	14,400	15,800	42,500	83,300	22,300
AUM, balance at end of year	$ 48,000	$ 196,800	$ 100,800	$ 235,100	$ 580,700	$ 492,800

n.a. not available

AUA by geographic mix and asset class Table 27

(Millions of Canadian dollars)	2016	2015
Canada (1)		
Money market	$ 21,600	$ 21,500
Fixed income	36,300	34,900
Equity	89,100	79,800
Multi-asset and other	180,700	157,400
Total Canada	$ 327,700	$ 293,600
U.S. (1), (2)		
Money market	$ 36,100	$ 32,700
Fixed income	126,800	114,600
Equity	200,800	189,300
Multi-asset and other	30,500	20,200
Total U.S.	$ 394,200	$ 356,800
Other International (1)		
Money market	$ 23,300	$ 24,500
Fixed income	21,400	26,500
Equity	89,600	93,300
Multi-asset and other	19,100	29,000
Total International	$ 153,400	$ 173,300
Total AUA (2)	$ 875,300	$ 823,700

(1) Geographic information is based on the location from where our clients are serviced.
(2) Amounts have been revised from those previously presented.

On November 2, 2015, we completed the acquisition of City National, which was combined with our U.S. Wealth Management business. Our U.S. & International Wealth Management business line was divided into two businesses: U.S. Wealth Management (including City National), and International Wealth Management.

Financial performance

2016 vs. 2015

Net income increased $432 million or 41% compared to last year, largely reflecting the inclusion of our acquisition of City National, which contributed $290 million to net income, lower restructuring costs relating to the International Wealth Management business, and benefits from our efficiency management activities. These factors were partially offset by lower transaction volumes.

Total revenue increased $2,014 million or 30%, mainly attributable to our inclusion of City National, which contributed $1,988 million (US$1,502 million), the impact from foreign exchange translation, and higher fee-based revenue primarily in our Canadian Wealth Management and U.S. Wealth Management businesses. These factors were partially offset by lower transaction volumes.

PCL increased $2 million. PCL in the current year largely reflects provisions of $43 million recorded in City National. PCL in the prior year largely reflected provisions related to the International Wealth Management business.

Non-interest expense increased $1,509 million or 29%, primarily reflecting our inclusion of City National, which increased expenses by $1,648 million, and included $196 million related to amortization of intangibles and $91 million related to integration costs. The impact from foreign exchange translation and costs relating to the exit of certain international businesses also contributed to the increase. These factors were partially offset by lower restructuring costs and benefits from our efficiency management activities.

Assets under administration increased by $52 billion or 6% compared to the prior year, mainly reflecting capital appreciation, the impact of foreign exchange translation and the inclusion of our acquisition of City National.

Assets under management increased by $88 billion or 18% compared to the prior year, primarily due to the inclusion of our acquisition of City National and capital appreciation.

2015 vs. 2014

Net income decreased $42 million or 4% from 2014, primarily reflecting higher costs in support of business growth in our Global Asset Management and Canadian Wealth Management businesses, restructuring costs of $122 million ($90 million after-tax) largely related to our International Wealth Management business, lower transaction volumes and higher PCL. These factors were partly offset by higher earnings from growth in average fee-based client assets resulting from capital appreciation and net sales.

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 1,650 investment advisors providing comprehensive advice-based financial solutions to affluent, HNW and UHNW clients. Additionally, we provide discretionary investment management and estate and trust services to our clients through approximately 70 investment counsellors and 91 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

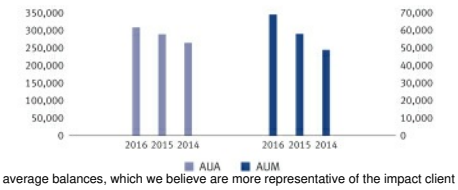
Revenue increased $142 million or 6% from a year ago, mainly due to higher average fee-based client assets reflecting strong net sales and capital appreciation and higher net interest income reflecting growth in average deposits.

Selected highlights (1) — Table 28

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$ 2,450**	$ 2,308	$ 2,146
Other information			
Total loans and acceptances (2)	**3,200**	3,100	2,700
Total deposits (2)	**16,300**	15,200	13,600
AUA	**326,600**	297,400	280,400
AUM	**76,000**	62,800	55,100
Average AUA	**309,100**	289,500	265,000
Average AUM	**69,400**	58,100	49,100
Total assets under fee-based programs	**206,900**	184,500	168,300

(1) Amounts have been revised from those previously presented.
(2) Represents an average amount, which is calculated using methods intended to approximate the average of the daily balances for the period.

Average AUA and AUM (1) (Millions of Canadian dollars)



(1) Represents average balances, which we believe are more representative of the impact client balances have upon our revenue.

U.S. Wealth Management (including City National)

U.S. Wealth Management (including City National) includes our private client group, which 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. In the U.S., we operate in a fragmented and extremely competitive industry. There are approximately 4,000 registered broker-dealers in the U.S., comprising independent, regional and global players. As previously announced, we combined U.S. Wealth Management and City National into one line of business effective the first quarter of 2016.

City National is headquartered in Los Angeles, California and operates through 73 offices, including 16 full service regional centres in Southern California, the San Francisco Bay area, New York City, Nashville and Atlanta. 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. City National competes with a variety of commercial banks and other financial institutions which serve high net worth individuals, entrepreneurs and their businesses.

Financial performance

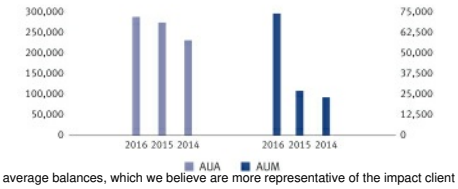
Revenue increased $2,115 million or 105% from a year ago, mainly reflecting the inclusion of City National, which contributed $1,988 million (US$1,502 million).

Selected highlights — Table 29

(Millions of Canadian dollars, except as otherwise noted)	2016	2015	2014
Total revenue	**$ 4,123**	$ 2,008	$ 1,748
Other information (Millions of U.S. dollars)			
Total revenue	**3,118**	1,603	1,599
Total loans, guarantees and letters of credit (1)	**29,900**	4,400	4,000
Total deposits (1)	**41,200**	3,700	1,800
AUA	**293,900**	272,900	275,500
AUM	**76,700**	28,600	25,600
Average AUA	**289,200**	275,100	232,300
Average AUM	**74,200**	27,300	23,200
Total assets under fee-based programs	**98,400**	94,500	94,500

(1) Represents an average amount, which is calculated using methods intended to approximate the average of the daily balances for the period.

Average AUA and AUM (1) (Millions of U.S. dollars)



(1) Represents average balances, which we believe are more representative of the impact client balances have upon our revenue.

International Wealth Management

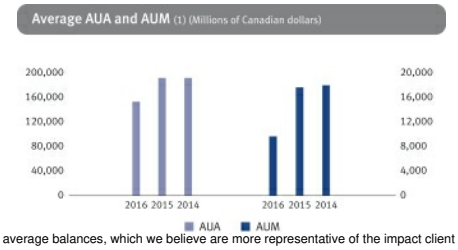
International Wealth Management includes operations in the British Isles and Asia. We provide customized and integrated trust, banking, credit and investment solutions to HNW and UHNW clients and corporate clients with over 1,400 employees located in key financial centres in Europe and Asia. Competitors 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 $209 million or 33% from a year ago, mainly reflecting the exit of certain international businesses.

Selected highlights — Table 30

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$ 430**	$ 639	$ 722
Other information			
Total loans, guarantees and letters of credit (1)	**7,200**	11,700	12,000
Total deposits (1)	**14,600**	19,700	20,600
AUA	**154,500**	169,500	190,500
AUM	**9,100**	10,900	17,700
Average AUA	**153,700**	192,300	192,300
Average AUM	**9,700**	17,700	18,000

(1) Represents an average amount, which is calculated using methods intended to approximate the average of the daily balances for the period.



(1) Represents average balances, which we believe are more representative of the impact client balances have upon our revenue.

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, asset management organizations and boutique firms. The Canadian fund management industry is large and mature, but still 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.

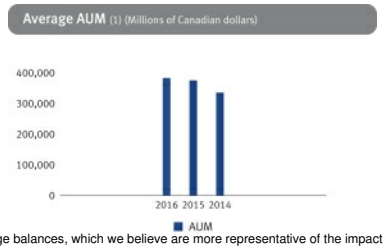
Internationally, through our leading global capabilities of BlueBay and RBC Global Asset Management®, we offer investment management solutions for institutions and, through private banks including RBC Wealth Management®, to HNW and UHNW investors. We face competition from asset managers that are part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

Financial performance
Revenue decreased $34 million or 2% from a year ago, reflecting unfavourable market conditions resulting in net redemptions in the first half of the year. This was partially offset by strong performance in the Canadian business in the second half of the year due to improved market conditions.

Selected highlights — Table 31

(Millions of Canadian dollars)	2016	2015	2014
Total revenue (1)	**$ 1,786**	$ 1,820	$ 1,697
Other information			
Canadian net long-term mutual fund sales (2)	**7,868**	9,857	10,982
Canadian net money market mutual fund (redemptions) sales (2)	**(439)**	(605)	(1,229)
AUM	**392,600**	381,700	350,600
Average AUM	**383,400**	374,700	335,300

(1) Effective the first quarter of 2014, we have aligned the reporting period of BlueBay, which resulted in an additional month of earnings being included in 2014.
(2) As reported to the Investment Funds Institute of Canada. Includes all prospectus-based mutual funds across our Canadian Global Asset Management businesses.



(1) Represents average balances, which we believe are more representative of the impact client balances have upon our revenue.

Insurance

Insurance comprises our operations in Canada and globally and operates under two business lines: Canadian Insurance and International Insurance, providing a wide range of life, health, home, auto, travel, wealth, group and reinsurance products and solutions. 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.

Economic and market review

The global macroeconomic environment continues to show improvement, with both the middle class and high net worth populations in quantity and financial resources on the rise in many countries. Key challenges for the insurance industry remain due to the increasing regulatory pressures, low interest rates, record high levels of debt, shifting demographics, changes in client expectations, and growth in non-traditional competitors. To overcome these challenges, many insurers are heavily investing in technological and digital solutions to improve the client experience and provide differentiation, refining products and distribution capability, and enhancing operational efficiency and managing expenses.

Highlights

- On July 1, 2016, we completed the sale of RBC General Insurance Company to Aviva Canada Inc. (Aviva). The transaction involved the sale of our home and auto insurance manufacturing business and included a 15-year strategic distribution agreement between RBC Insurance and Aviva.
- In our Canadian Insurance business, we experienced strong sales growth, maintaining our #1 ranking in individual disability sales, #11 in individual life products and have been increasing market share in Group Insurance and Wealth, which are targeted areas of focus.
- We launched *Your*Term™, a new life insurance product, as part of an innovative renewal and client retention strategy, allowing clients to select a specific term for their life insurance.
- We have partnered with digital insurer League to underwrite its expanded offerings, providing comprehensive coverage for unexpected emergencies, as well as a range of group life and health insurance products, including life, accidental death and dismemberment, and disability coverage.
- We continued to focus on enhancing our client experience and our cost effectiveness through ongoing transformation of our legacy business and enhancing our digital capabilities.
- In the fall of 2016, we introduced new and innovative tools to help clients who are on disability recover and return to work more quickly. These include an exclusive arrangement with Best Doctors Onward as well as a partnership with Medical Confidence.
- We continued to expand our U.K. annuity business, though we experienced some volatility reflecting changing market conditions, including foreign exchange impacts after the Brexit vote.

Outlook and priorities

While we see signs of improvement in the macroeconomic environment, growing risk and economic insecurity continue to prevail; therefore, growth in the industry is projected to be moderate in the short to medium term. We are focusing on organic growth through our proprietary sales channels, improved claims performance and increased operational efficiency.

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

Key strategic priorities for 2017

- Deepen client relationships by continuing to be an innovative, client-focused provider of a full suite of insurance products.
- Continue to improve our distribution efficiency by expanding our proprietary distribution channels and focusing on the delivery of technology and operational solutions.
- Simplify and innovate by accelerating our digital initiatives time to market, improving quality and cost effectiveness.
- Pursue select international opportunities, within our risk appetite, with the aim of continuing to grow our core reinsurance business.

Insurance			Table 32
(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	**2016**	2015	2014
Non-interest income			
Net earned premiums	**$ 3,175**	$ 3,507	$ 3,742
Investment income (1)	**1,422**	445	938
Fee income	**554**	484	284
Total revenue	**5,151**	4,436	4,964
Insurance policyholder benefits and claims (1)	**3,208**	2,741	3,194
Insurance policyholder acquisition expense	**216**	222	379
Non-interest expense (2)	**623**	613	579
Income before income taxes	**1,104**	860	812
Net income	**$ 900**	$ 706	$ 781
Revenue by business			
Canadian Insurance	**$ 3,373**	$ 2,725	$ 2,911
International Insurance	**1,778**	1,711	2,053
Key ratios			
ROE	**52.8%**	44.3%	49.7%
Selected balances and other information			
Total assets	**$ 14,400**	$13,700	$ 12,000
Attributed capital	**1,700**	1,600	1,550
Other information			
Premiums and deposits (3)	**$ 4,594**	$ 5,016	$ 5,164
Canadian Insurance	**2,424**	2,725	2,419
International Insurance	**2,170**	2,291	2,745
Insurance claims and policy benefit liabilities	**9,164**	9,110	8,564
Fair value changes on investments backing policyholder liabilities (1)	**633**	(24)	439
Embedded value (4)	**6,886**	6,952	6,239
Number of employees (FTE)	**2,657**	3,163	3,126

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

(Millions of Canadian dollars, except percentage amounts)	**2016 vs. 2015**
Increase (decrease):	
Total revenue	**$ (54)**
PBCAE	**(39)**
Non-interest expense	**–**
Net income	**(15)**
Percentage change in average US$ equivalent of C$1.00	**(5)%**
Percentage change in average British pound equivalent of C$1.00	**5%**

(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) For 2016, includes PCL of $1 million (2015 - $nil; 2014 - $nil).
(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.

On July 1, 2016, we completed the sale of RBC General Insurance Company to Aviva Canada Inc. (Aviva) as previously announced on January 21, 2016. The transaction involved the sale of our home and auto insurance manufacturing business and included a 15-year strategic distribution agreement between RBC Insurance and Aviva. As a result of the transaction, we recorded a gain of $287 million ($235 million after-tax) in our results. For further details, refer to Note 11 of our 2016 Annual Consolidated Financial Statements.

Financial performance

2016 vs. 2015

Net income increased $194 million or 27% from a year ago. Excluding the after-tax gain of $235 million on the sale of RBC General Insurance Company to Aviva, net income decreased $41 million or 6%, mainly due to lower earnings from new U.K. annuity contracts as well as lower earnings reflecting the impact from the sale of our home and auto insurance manufacturing business as noted above. These items were partially offset by growth in International Insurance.

Total revenue increased $715 million or 16%, mainly due to a change of $657 million related to the fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, largely offset in PBCAE, and the gain on the sale of RBC General Insurance Company as noted above. These factors were partially offset by lower premiums reflecting the impact of the sale of our home and auto insurance manufacturing business and the impact due to foreign exchange translation.

PBCAE increased $461 million or 16%, mainly due to a change in the fair value of investments backing our policyholder liabilities, largely offset in revenue. This factor was partially offset by lower costs reflecting the impact from the sale of our home and auto insurance manufacturing business as noted above.

Non-interest expense increased $10 million or 2%, largely in support of business growth and strategic initiatives, partially offset by reduced expenses reflecting the impact of the sale of our home and auto insurance manufacturing business, as noted above, and efficiency management activities.

Premiums and deposits were down $422 million or 8%, reflecting the impact of the sale of our home and auto insurance manufacturing business, as noted above, and a reduction related to our retrocession contracts. This was partially offset by growth in International Insurance.

Embedded value decreased $66 million, reflecting the impact of the sale of our home and auto insurance manufacturing business, as noted above, and the transfer of capital though dividends paid, largely offset by business growth. For further details, refer to the Key performance and non-GAAP measures section.

2015 vs. 2014

Net income decreased $75 million or 10% from 2014, mainly due to a change in Canadian tax legislation impacting certain foreign affiliates that became effective November 1, 2014, a lower level of favourable actuarial adjustments in 2015, and higher net claims costs. These factors were partially offset by higher earnings from new U.K. annuity contracts and the favourable impact of investment-related activities on the Canadian life business.

Results excluding the specified item noted above 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 as well as in home and auto through our distribution agreement with Aviva.

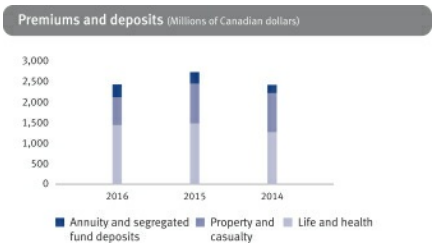
Financial performance

Total revenue increased $648 million or 24% from last year, mainly due to the fair value of investments backing our policyholder liabilities resulting from changes in long-term interest rates, largely offset in PBCAE, and the gain on sale of our home and auto insurance manufacturing business as noted above, partially offset by lower premiums reflecting the impact of the sale.

Premiums and deposits decreased $301 million or 11%, reflecting the impact of the sale of our home and auto insurance manufacturing business, as noted above.

Selected highlights — Table 33

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$3,373**	$2,725	$2,911
Other information			
Premiums and deposits			
Life and health	**1,438**	1,484	1,266
Property and casualty	**674**	958	951
Annuity and segregated fund deposits	**312**	283	202
Fair value changes on investments backing policyholder liabilities	**575**	54	490



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 the Euro area. The reinsurance industry is competitive but barriers to entry remain high.

Financial performance

Total revenue increased $67 million or 4%, 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. This factor was partially offset by a reduction in revenue related to our retrocession contracts, largely offset in PBCAE, and the impact due to foreign exchange translation.

Premiums and deposits decreased $121 million or 5%, driven by the reduction in premium related to our retrocession contracts, partly offset by growth in the U.K. annuity contracts.

Selected highlights — Table 34

(Millions of Canadian dollars)	2016	2015	2014
Total revenue	**$1,778**	$1,711	$2,053
Other information			
Premiums and deposits			
Life and health	**1,335**	1,483	2,128
Property and casualty	**–**	(4)	6
Annuity	**835**	812	611
Fair value changes on investments backing policyholder liabilities	**58**	(78)	(51)

Investor & Treasury Services

Investor & Treasury Services is a specialist provider of asset services, custody, payments and treasury services for financial and other institutional investors worldwide. We deliver custodial, advisory, financing and other services to safeguard client assets, maximize liquidity, and manage risk across multiple jurisdictions. We also provide short-term funding and liquidity management for RBC. We are a global custodian with a network of offices across North America, Europe and Asia-Pacific. While we compete against the world's largest global custodians, we remain a specialist provider with a focus on asset managers offering offshore fund structures in Luxembourg and Ireland, and alternative asset managers of real estate and private equity funds. Our transaction banking business is a leading provider of Canadian dollar cash management, correspondent banking, and trade finance for financial institutions globally.

Economic and market review

The highly competitive environment in the global asset services industry continued to pressure margins. Sustained low to negative interest rates globally have reduced deposit rates, leading to margin compression from our deposit-gathering activities. Moreover, continued increases in financial services regulations have driven up compliance and technology costs. Market uncertainty (including Brexit and central bank policy rates) has impacted our core fees and foreign exchange transaction volumes; however, tightening credit spreads and favourable interest rate movements benefited our funding and liquidity business.

Highlights

- Rated by our clients the #1 global custodian for six consecutive years (Global Investor/ISF Global Custody Survey, 2016).
- Rated #1 custodian overall in Canada and Europe (excl. Switzerland and the U.K.) (R&M Investor Services Survey, 2016).
- Named #1 Canadian sub-custodian (Global Custodian Agent Banks in Major Markets Survey, 2016).
- Maintained global position as the #1 fund administrator overall for four consecutive years (R&M Fund Accounting and Administration Survey, 2016).
- Named Best Trade Finance Bank in Canada for four consecutive years (*Global Finance*, 2016).
- High level of investment in client-focused technology solutions.

Outlook and priorities

In 2017, our aim is to continue to be the leading provider of domestic asset services and cash management in Canada and a leading provider of fund services to asset managers in select offshore markets. Our focus is on driving top-line growth by leveraging our leadership position in Canada and recognized capabilities in the offshore fund services markets in Luxembourg and Ireland to win new business and deepen existing client relationships. We continue to execute on our strategic and transformational technology initiatives to enhance client experiences. While we expect the global asset services industry to remain challenging in the near-term, we are well-positioned to compete 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.

Key strategic priorities for 2017

- Maintain our position as the #1 provider of domestic custody, asset services and cash management in Canada.
- Compete as a leading provider of asset services in the major offshore fund domicile markets of Luxembourg and Ireland.
- Continue to deliver a high-level of investment in client-focused technology solutions.
- Enhance our client centric service offering and improve efficiency.

Investor & Treasury Services			Table 35
(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	**2016**	2015	2014
Net interest income	**$ 825**	$ 818	$ 732
Non-interest income	**1,446**	1,220	1,152
Total revenue (1)	**2,271**	2,038	1,884
Non-interest expense	**1,457**	1,300	1,286
Net income before income taxes	**814**	738	598
Net income	**$ 613**	$ 556	$ 441
Key Ratios			
ROE	**17.9%**	20.3%	19.8%
Selected average balance sheet information			
Total assets	**$ 142,500**	$ 125,300	$ 94,200
Deposits	**134,300**	139,600	112,100
Client deposits	**52,800**	50,400	42,700
Wholesale funding deposits	**81,500**	89,200	69,400
Attributed capital	**3,350**	2,700	2,150
Other Information			
AUA (2)	**3,929,400**	3,620,300	3,702,800
Average AUA	**3,770,200**	3,793,000	3,463,000
Number of employees (FTE)	**4,776**	4,774	4,963

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

(Millions of Canadian dollars, except percentage amounts)	2016 vs. 2015
Increase (decrease):	
Total revenue	**$ 40**
Non-interest expense	**10**
Net income	**20**
Percentage change in average US$ equivalent of C$1.00	**(5)%**
Percentage change in average British pound equivalent of C$1.00	**5%**
Percentage change in average Euro equivalent of C$1.00	**(3)%**

(1) Effective the third quarter of 2015, we have aligned the reporting period of Investor Services, which resulted in an additional month of earnings being included in 2015. The net impact of the additional month was recorded in revenue.

(2) Represents period-end spot balances.

Financial performance

2016 vs. 2015

Net income increased $57 million or 10%, primarily due to higher funding and liquidity earnings reflecting tightening credit spreads and favourable interest rate movements, and higher client deposit spreads. These factors were partially offset by increased investment in technology initiatives, higher staff costs and lower earnings from foreign exchange market execution. In addition, the prior year included an additional month of earnings in Investor Services of $42 million ($28 million after-tax).

Total revenue increased $233 million or 11%, mainly related to higher funding and liquidity revenue reflecting tightening credit spreads and favourable interest rate movements, increased revenue on higher client deposit spreads, and the impact from foreign exchange translation. These factors were partially offset by lower revenue from foreign exchange market execution. In addition, the prior year included the impact of an additional month in Investor Services as noted above.

Non-interest expense increased $157 million or 12%, largely reflecting increased investment in technology initiatives, higher staff costs, and the impact from foreign exchange translation.

2015 vs. 2014

Net income was up $115 million or 26% from 2014, primarily due to higher earnings from foreign exchange market execution, an additional month of earnings in Investor Services as noted above, increased custodial fees and higher earnings from growth in client deposits. These factors were partially offset by lower funding and liquidity results.

Capital Markets

Capital Markets provides public and private companies, institutional investors, governments and central banks globally with a wide range of capital markets products and services across our 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 Other international, 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 and healthcare in Europe. In the U.K. and Europe, we compete in our key sectors of expertise with global and regional investment banks. In Other international, 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.

Economic and market review

Following the deterioration of market conditions throughout the latter half of fiscal 2015, the first half of 2016 was characterized by volatile debt and equity markets as well as difficult market conditions. This was driven by the effect of stronger but still lower than historical levels for global oil and commodity prices, as well as diverging monetary policies amongst global central banks. This led to decreased levels of client activity and volumes. Our corporate and investment banking businesses saw debt underwriting rebound in the latter part of the year with good activity in investment grade and a recovery in high yield. Although the market backdrop improved in the latter half of the year, equity market volatility remained through the end of the year.

Highlights

- We continued to focus on the efficient deployment of our capital and growth throughout our businesses by re-allocating capital from trading to corporate and investment banking businesses and managed risk by focusing on optimizing our trading products.
- In Canada, we maintained our market leadership by deepening our existing client relationships despite soft markets in both the energy and commodity sectors, gaining new clients by leveraging our strong global capabilities and improving collaboration with enterprise partners to drive operational efficiencies. We continued to win significant mandates including acting as lead left bookrunner on the TransCanada Pipelines $4.4 billion bought deal offering of subscription receipts in addition to being the joint bookrunner on the supporting US$3.2 billion equity bridge and the US$7.1 billion asset sale bridge.
- In the U.S., we continued to leverage our key strategic investments to expand our corporate and investment banking businesses as we optimized our lending relationships, focusing on leveraging these relationships to generate additional revenue. Despite softer investment banking fees from lighter industry-wide underwriting activity, we continued to win significant mandates including acting as joint bookrunner on the acquisition financing and financial advisor to Dell Inc. on the acquisition of EMC Corporation for US$49 billion in cash and stock transaction, joint lead arranger and joint bookrunner on the financing supporting Western Digital Corporation's US$17 billion acquisition of SanDisk, as well as acting as financial advisor, joint lead arranger and joint bookrunner on the US$12.4 billion acquisition of ADT by Protection 1 and Apollo Global Management.
- In the U.K. and Europe, we continued to focus on maintaining momentum throughout the year and improving profitability through repositioning our fixed income business, as well as growing our corporate and investment banking presence in key markets, by developing strong client relationships. We acted as sole financial adviser to Kohlberg Kravis Roberts & Co. on the sale of Coriance Group SAS, a leading French district heating concession business, to First State Investments for an undisclosed amount. The transaction represents a successful example of cross-border cooperation involving an integrated advisory team across Utilities & Renewables, France and M&A.
- In Other international, we continued to focus on our corporate and investment banking, fixed income trading distribution and foreign exchange trading capabilities.
- As a result of our successes in each of our regions, we received external recognition as an industry leader and were named or ranked:
  - Best Investment Bank in Canada (*Euromoney* Magazine) for the ninth consecutive year.
  - Best Bank for Markets in North America (*Euromoney* Magazine)
  - World's Best Developed Markets Banks (Canada) (*Global Finance*)
  - The largest investment bank in Canada by fees for the first nine months of 2016 (*Dealogic*).
  - The 10th largest investment bank globally and in the Americas by fees for the first nine months of 2016 (*Thomson Reuters*).

Outlook and priorities

Global market volatility dominated headlines for Investment Banking with the global fee pool down 10% in the first nine months of 2016 from the same period in 2015. With an improved market environment expected in 2017, our investment banking revenue is forecast to improve and healthier origination volumes should help lift secondary trading activity. We will focus on maximizing returns through business structure and continual optimization of the balance sheet, as well as improving operating leverage through cost containment initiatives. Regulatory impacts continue to make earnings growth a challenge as regulatory and tax changes constrain revenue growth and regulatory reform implementation continues to exert upward pressure on expenses and capital.

For further details, refer to our Risk management – Top and emerging risks section. For further details on our general economic outlook, refer to the Economic, market and regulatory review and outlook section.

Key strategic priorities for 2017

- Capital Markets will maintain its focus on full service activities in Canada, the U.S. and Europe.
- Maintain our leadership position in Canada by focusing on long-term client relationships, leveraging our global capabilities and continuing to improve collaboration with Wealth Management.
- Continue to expand and strengthen 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. We expect the U.S. to continue to be the world's most attractive market and it will remain Capital Markets' priority growth market.
- Build on our core strengths in Europe in both Corporate and Investment Banking and Global Markets by continuing to grow and deepen client relationships and in Asia by optimizing the performance of our existing footprint.
- 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.
- Manage through the significant changes in the regulatory environment.

Capital Markets financial highlights **Table 36**

(Millions of Canadian dollars, except percentage amounts and as otherwise noted)	2016	2015	2014
Net interest income (1)	$ 3,804	$ 3,970	$ 3,485
Non-interest income (1)	4,146	4,093	3,881
Total revenue (1)	7,950	8,063	7,366
PCL	327	71	44
Non-interest expense	4,466	4,696	4,344
Net income before income taxes	3,157	3,296	2,978
Net income	$ 2,270	$ 2,319	$ 2,055
Revenue by business			
Corporate and Investment Banking	$ 3,694	$ 3,697	$ 3,437
Global Markets (2)	4,361	4,477	3,896
Other (2)	(105)	(111)	33
Key ratios			
ROE	12.2%	13.6%	14.1%
Selected average balance sheet information			
Total assets	$ 508,200	$ 477,300	$ 392,300
Trading securities	104,900	116,200	103,800
Loans and acceptances	88,100	79,700	64,800
Deposits	61,500	60,300	47,600
Attributed capital	17,900	16,550	14,100
Other information			
Number of employees (FTE)	3,883	3,996	3,917
Credit information			
Gross impaired loans as a % of average net loans and acceptances	1.73%	0.37%	0.08%
PCL on impaired loans as a % of average net loans and acceptances	0.37%	0.09%	0.07%

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)	2016 vs. 2015
Increase (decrease):	
Total revenue	$ 259
Non-interest expense	72
Net income	115
Percentage change in average US$ equivalent of C$1.00	(5)%
Percentage change in average British pound equivalent of C$1.00	5%
Percentage change in average Euro equivalent of C$1.00	(3)%

(1) The taxable equivalent basis (teb) adjustment for 2016 was $736 million (2015 – $570 million, 2014 – $492 million). For further discussion, refer to the How we measure and report our business segments section of our 2016 Annual Report.

(2) Effective the first quarter of 2015, we reclassified amounts from Global Markets to Other related to certain proprietary trading strategies which we exited in the fourth quarter of 2014 to comply with the Volcker Rule. Prior period amounts have been revised from those previously presented.



Financial performance

2016 vs. 2015

Net income decreased $49 million or 2%, driven by higher PCL, lower results in our Global Markets and Corporate and Investment Banking businesses reflecting lower client activity, and higher compliance costs. These factors were partially offset by lower variable compensation, the impact from foreign exchange translation and lower litigation provisions.

Total revenue decreased $113 million or 1%, largely reflecting lower equity trading revenue and lower lending revenue primarily in the U.S. and Europe, and lower private equity investment gains. These factors were partially offset by the impact from foreign exchange translation and higher fixed income trading revenue mainly in Europe and Canada.

PCL increased $256 million, primarily due to higher provisions in the oil & gas sector. For further details, refer to the Credit quality performance section.

Non-interest expense decreased $230 million or 5%, reflecting lower variable compensation largely due to changes in the deferral policy of the compensation plan and lower litigation provisions, partially offset by the impact from foreign exchange translation and higher compliance costs.

2015 vs. 2014
Net income increased $264 million or 13% from 2014, driven by growth in our Global Markets business mainly reflecting increased client activity, continued solid performance in our Corporate and Investment Banking business, and the impact from foreign exchange translation. These factors were partially offset by lower results in certain legacy portfolios.

Business line review

Corporate and Investment Banking

Corporate and Investment Banking comprises our corporate lending, loan syndications, debt and equity origination, M&A advisory services, private equity, research, 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 $3,694 million decreased $3 million as compared to last year.

Investment banking revenue increased $59 million or 3%, primarily due to growth in Municipal Banking in the U.S. and higher M&A activity across most regions, partially offset by lower private equity investment gains and lower equity origination activity largely in the U.S.

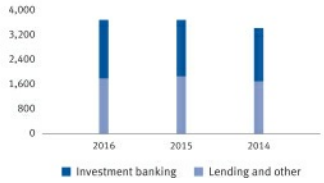
Lending and other revenue decreased $62 million or 3%, due to lower spreads across most regions.

Selected highlights — Table 37

(Millions of Canadian dollars)	2016	2015	2014
Total revenue (1)	**$ 3,694**	$ 3,697	$ 3,437
Breakdown of revenue (1)			
Investment banking	**1,892**	1,833	1,736
Lending and other (2)	**1,802**	1,864	1,701
Other information			
Average assets	**73,200**	63,900	49,500
Average loans and acceptances	**65,300**	56,200	42,500

(1) The teb adjustment for 2016 was $279 million (2015 – $25 million, 2014 – $13 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 $4,361 million decreased $116 million or 3% as compared to last year.

Revenue in our Fixed income, currencies and commodities business increased $226 million or 12%, mainly due to higher fixed income and foreign exchange trading revenue, partially offset by lower debt origination activity across all regions.

Revenue in our Equities business decreased $288 million or 20%, primarily due to lower equity trading revenue across most regions and lower volume in our cash equities businesses.

Revenue in our Repo and secured financing business decreased $54 million or 5%, mainly due to lower trading revenue reflecting decreased client activity.

Selected highlights — Table 38

(Millions of Canadian dollars)	2016	2015 (1)	2014 (1)
Total revenue (2)	**$ 4,361**	$ 4,477	$ 3,896
Breakdown of revenue (2)			
Fixed income, currencies and commodities	**2,113**	1,887	1,760
Equities	**1,147**	1,435	1,204
Repo and secured financing (3)	**1,101**	1,155	932
Other information			
Average assets	**472,100**	494,400	366,000

(1) Amounts have been revised from those previously presented.
(2) The teb adjustment for 2016 was $457 million (2015 – $545 million, 2014 – $470 million). For further discussion, refer to the How we measure and report our business segments section.
(3) 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 consists of our bank-owned life insurance (BOLI) stable value products, U.S. commercial mortgage-backed securities, U.S. auction rate securities (ARS), 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 3% as compared to last year.

Financial performance
Revenue increased $6 million as compared to last year.

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 39

(Millions of Canadian dollars, except as otherwise noted)	**2016**	2015	2014
Net interest income (loss) (1)	**$ (390)**	$ (514)	$ (313)
Non-interest income (loss) (1)	**(202)**	210	164
Total revenue (1)	**(592)**	(304)	(149)
PCL	**51**	(3)	(2)
Non-interest expense	**30**	125	89
Net income (loss) before income taxes (1)	**(673)**	(426)	(236)
Income taxes (recoveries) (1)	**(691)**	(824)	(405)
Net income (loss) (2)	**$ 18**	$ 398	$ 169
Other information			
Number of employees (FTE) (3)	**13,913**	13,371	12,540

(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, 2016 was $44 million (October 31, 2015 – $94 million; October 31, 2014 – $93 million).
(3) Amounts have been revised from previously presented.

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, 2016 was $736 million as compared to $570 million last year and $492 million for the year ended October 31, 2014.

In addition to the teb impacts noted above, the following identifies the other material items affecting the reported results in each period.

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.

2015
Net income was $398 million largely reflecting net favourable tax adjustments, asset/liability management activities, a gain of $108 million (before- and after-tax) from the wind-up of a U.S.-based funding subsidiary that resulted in the release of CTA, and a gain on sale of a real estate asset. These factors were partially offset by transaction costs related to our acquisition of City National.

2014
Net income was $169 million largely reflecting asset/liability management activities and gains on private equity investments mainly related to the sale of a legacy portfolio, partially offset by net unfavourable tax adjustments.

Results by geographic segment (1)

For geographic reporting, our segments are grouped into the following: Canada, U.S., and Other International. Transactions are primarily recorded in the location that best reflects the risk due to negative changes in economic conditions and prospects for growth due to positive economic changes. The following table summarizes our financial results by geographic region:

Table 40

	2016				2015				2014			
(Millions of Canadian dollars)	**Canada**	**U.S.**	**Other International**	**Total**	Canada	U.S.	Other International	Total	Canada	U.S.	Other International	Total
Net interest income	**$ 11,685**	**$ 3,241**	**$ 1,605**	**$ 16,531**	$ 11,538	$ 1,977	$ 1,256	$ 14,771	$ 11,128	$ 1,697	$ 1,291	$ 14,116
Non-interest income	**12,054**	**4,992**	**4,828**	**21,874**	10,889	4,619	5,042	20,550	10,488	4,257	5,247	19,992
Total revenue	**$ 23,739**	**$ 8,233**	**$ 6,433**	**$ 38,405**	$ 22,427	$ 6,596	$ 6,298	$ 35,321	$ 21,616	$ 5,954	$ 6,538	$ 34,108
PCL	**1,231**	**254**	**61**	**1,546**	933	98	66	1,097	922	52	190	1,164
PBCAE	**2,304**	**–**	**1,120**	**3,424**	1,976	–	987	2,963	2,188	1	1,384	3,573
Non-interest expense	**10,229**	**6,151**	**3,756**	**20,136**	10,139	4,762	3,737	18,638	9,650	4,199	3,812	17,661
Income taxes	**2,158**	**397**	**286**	**2,841**	1,727	649	221	2,597	1,983	660	63	2,706
Net income	**$ 7,817**	**$ 1,431**	**$ 1,210**	**$ 10,458**	$ 7,652	$ 1,087	$ 1,287	$ 10,026	$ 6,873	$ 1,042	$ 1,089	$ 9,004

(1) For further details, refer to Note 30 of our audited 2016 Annual Consolidated Financial Statements.

2016 vs. 2015

Net income in Canada was up $165 million or 2% from the prior year, mainly due to higher earnings from growth in average fee-based client assets in Wealth Management, the gain on sale of our home and auto insurance manufacturing business, and volume and fee-based revenue growth across most businesses in Canadian Banking. These factors were partially offset by higher PCL, increased investment in technology, and higher costs to support business growth. In addition, the prior year benefited from a lower effective tax rate reflecting net favourable income tax adjustments, as well as a gain from the wind-up of a U.S. subsidiary.

U.S. net income increased $344 million or 32% compared to last year, largely reflecting lower taxes, the inclusion of earnings from our acquisition of City National, and lower variable compensation in Capital Markets. This was partly offset by lower equity trading and lending earnings and higher PCL.

Other International net income was down $77 million or 6% from the prior year, mainly due to higher costs to support business growth in Investor & Treasury Services and in the Caribbean, lower earnings from new U.K. annuity contracts in Insurance, and the exit of certain international businesses in Wealth Management. This was partially offset by higher fixed income trading results and increased M&A activity in Capital Markets, higher funding and liquidity earnings in Investor & Treasury Services reflecting tightening credit spreads and favourable interest rate movements, the impact from foreign exchange translation and higher fee-based revenue in the Caribbean.

2015 vs. 2014

Net income in Canada was up $779 million or 11% as compared to 2014, mainly due to solid volume growth and strong fee-based revenue growth across most businesses in Canadian Banking, a lower effective tax rate reflecting net favourable income tax adjustments, and higher earnings in Investor & Treasury Services. A gain of $108 million (before- and after-tax) from the wind-up of a U.S.-based funding subsidiary that resulted in the release of CTA also contributed to the increase. These factors were partially offset by higher costs in support of business growth, and lower spreads.

U.S. net income was up $45 million or 4% as compared to 2014, primarily due to the impact from foreign exchange translation, growth in our global markets businesses reflecting increased client activity and more favourable market conditions in the first half of 2015, and higher results in most corporate and investment banking businesses. Lower litigation provisions and related legal costs in Capital Markets also contributed to the increase. These factors were partially offset by higher costs in support of business growth.

Other International net income was up $198 million or 18% as compared to 2014, mainly due to lower PCL in our Caribbean portfolios, and higher lending activity in Europe. These factors were partially offset by restructuring costs related to our International Wealth Management business. In addition, our results in 2014 were unfavourably impacted by a loss of $100 million (before- and after-tax) related to the sale of RBC Jamaica and a provision of $40 million ($32 million after-tax) related to post-employment benefits and restructuring charges in the Caribbean.

Quarterly financial information

Fourth quarter 2016 performance

Q4 2016 vs. Q4 2015

Fourth quarter net income of $2,543 million was down $50 million or 2% from last year. Diluted EPS of $1.65 was down $0.09 and ROE of 15.5% was down 240 bps. Our fourth quarter earnings decreased as lower results in Capital Markets were mostly offset by strong earnings in Wealth Management and Investor & Treasury Services, and higher earnings in Personal & Commercial Banking and Insurance. In addition, the prior year benefited from net favourable tax adjustments.

Total revenue increased $1,246 million or 16%, mainly due to the inclusion of City National, which contributed $543 million (US$411 million), the change in the fair value of investments backing our policyholder liabilities, largely offset in PBCAE, and higher fixed income trading revenue and strong debt and equity origination activity. Higher funding and liquidity revenue reflecting tightening credit spreads and favourable interest rate movements, increased loan syndication revenue, and solid volume growth across most businesses in Canadian Banking also contributed to the increase. These factors were partially offset by lower equity trading revenue across most regions and lower premiums reflecting the impact of the sale of our home and auto insurance manufacturing business.

Total PCL increased $83 million and the PCL ratio of 27 bps increased 4 bps from last year, mainly reflecting higher provisions in our Canadian personal and commercial lending portfolios and higher write-offs in our Canadian credit cards portfolio. Higher provisions, net of recoveries, in the energy sector in Capital Markets also contributed to the increase.

PBCAE increased $105 million or 36%, largely reflecting the change in fair value of investments backing our policyholder liabilities, largely offset in revenue, and growth mainly in International Insurance. These factors were partially offset by the impact from the sale of our home and auto insurance manufacturing business as noted above.

Non-interest expense increased $551 million or 12%, primarily reflecting the inclusion of our acquisition of City National, which increased expenses by $440 million, including $49 million related to the amortization of intangibles and $16 million related to integration costs. Higher variable compensation on improved results in Capital Markets and Wealth Management, and higher costs in support of business growth also contributed to the increase. These factors were partially offset by continuing benefits from our efficiency management activities and lower costs as a result of the sale of the home and auto insurance manufacturing business as noted above. The prior year also included restructuring costs largely related to our International Wealth Management business, including the sale of RBC Suisse.

Income tax expense increased $557 million from last year, and the effective income tax rate increased from 7.6% last year to 23.2%, as the prior year included net favourable tax adjustments mainly in Corporate Support and Capital Markets.

Q4 2016 vs. Q3 2016

Net income of $2,543 million decreased $352 million, or 12% compared to the prior quarter. The prior quarter included a gain of $287 million ($235 million after-tax) on the sale of our home and auto insurance manufacturing business. Lower earnings in Capital Markets mainly due to lower fixed income and equity trading results, and lower earnings in Personal & Commercial Banking largely driven by higher technology spend and seasonally higher marketing costs in support of business growth also contributed to the decrease. These factors were partially offset by strong earnings in Insurance mainly due to favourable actuarial adjustments reflecting management actions and assumption changes, and strong earnings in Investor & Treasury Services largely driven by higher funding and liquidity revenue reflecting tightening credit spreads and favourable interest rate movements.

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 41**

(Millions of Canadian dollars, except per share and percentage amounts)	2016 Q4	2016 Q3	2016 Q2	2016 Q1	2015 Q4	2015 Q3	2015 Q2	2015 Q1
Net interest income	**$ 4,187**	**$ 4,123**	**$ 4,025**	**$ 4,196**	$ 3,800	$ 3,783	$ 3,557	$ 3,631
Non-interest income	**5,078**	**6,132**	**5,501**	**5,163**	4,219	5,045	5,273	6,013
Total revenue	**$ 9,265**	**$ 10,255**	**$ 9,526**	**$ 9,359**	$ 8,019	$ 8,828	$ 8,830	$ 9,644
PCL	**358**	**318**	**460**	**410**	275	270	282	270
PBCAE	**397**	**1,210**	**988**	**829**	292	656	493	1,522
Non-interest expense	**5,198**	**5,091**	**4,887**	**4,960**	4,647	4,635	4,736	4,620
Net income before income taxes	**$ 3,312**	**$ 3,636**	**$ 3,191**	**$ 3,160**	$ 2,805	$ 3,267	$ 3,319	$ 3,232
Income taxes	**769**	**741**	**618**	**713**	212	792	817	776
Net income	**$ 2,543**	**$ 2,895**	**$ 2,573**	**$ 2,447**	$ 2,593	$ 2,475	$ 2,502	$ 2,456
EPS – basic	**$ 1.66**	**$ 1.88**	**$ 1.67**	**$ 1.59**	$ 1.74	$ 1.66	$ 1.68	$ 1.66
– diluted	**1.65**	**1.88**	**1.66**	**1.58**	1.74	1.66	1.68	1.65
Segments – net income (loss)								
Personal & Commercial Banking	**$ 1,275**	**$ 1,322**	**$ 1,297**	**$ 1,290**	$ 1,270	$ 1,281	$ 1,200	$ 1,255
Wealth Management	**396**	**388**	**386**	**303**	255	285	271	230
Insurance	**228**	**364**	**177**	**131**	225	173	123	185
Investor & Treasury Services	**174**	**157**	**139**	**143**	88	167	159	142
Capital Markets	**482**	**635**	**583**	**570**	555	545	625	594
Corporate Support	**(12)**	**29**	**(9)**	**10**	200	24	124	50
Net income	**$ 2,543**	**$ 2,895**	**$ 2,573**	**$ 2,447**	$ 2,593	$ 2,475	$ 2,502	$ 2,456
Effective income tax rate	**23.2%**	**20.4%**	**19.4%**	**22.6%**	7.6%	24.2%	24.6%	24.0%
Period average US$ equivalent of C$1.00	**$ 0.757**	**$ 0.768**	**$ 0.768**	**$ 0.728**	$ 0.758	$ 0.789	$ 0.806	$ 0.839

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

Seasonality

Seasonal factors may impact our results in certain quarters. The first quarter has historically been seasonally 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 and investment management businesses.

Specified items affecting our consolidated results

- 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 Canada Inc.
- In the second quarter of 2015, our results included a gain of $108 million (before- and after-tax) from the wind-up of a U.S.-based subsidiary that resulted in the release of a foreign currency translation adjustment that was previously booked in other components of equity.

Trend analysis

The Canadian economy has generally improved over the period expanding in the first half of calendar 2016 due to solid consumer spending and housing activity, reflecting low interest rates and a resilient labour market. However, business investment remained weak and was compounded by the Alberta wildfires which temporarily halted oil production in the region. The U.S. economy has generally seen growth over the period,

experiencing modest growth in the second calendar quarter of 2016 boosted by robust consumer spending reflecting solid job growth and rising wages, offset by declines in business and residential investment. Global markets recorded minimal gains this year amid several periods of heightened volatility related to global growth concerns. For further details, refer to the Economic and market review and outlook section.

Earnings have generally trended upwards over the period, driven by volume growth partially offset by lower spreads and higher fee-based revenue in our Canadian Banking businesses, as well as higher earnings from growth in average fee-based client assets reflecting strong net sales and capital appreciation in Wealth Management driven by improved market conditions. Results of our acquisition of City National have been reflected in our Wealth Management segment since the first quarter of 2016. Capital Markets results have remained relatively stable over the period, declining in the fourth quarter of 2016 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 RBC General Insurance Company in the third quarter of 2016. Investor & Treasury Services results have fluctuated over the period, and in the third quarter of 2015 benefited from an additional month of earnings in Investor Services. Higher funding and liquidity earnings reflecting tightening credit spreads and favourable interest rate movements contributed to the increase in the fourth quarter of 2016.

Revenue has generally increased over the period reflecting solid volume and fee-based revenue growth in our Canadian Banking businesses, as well as growth in average fee-based client assets in Wealth Management. Wealth Management revenue has reflected the inclusion of our acquisition of City National since the first quarter of 2016. Trading revenue has generally trended upwards over the period, and has fluctuated since the second half of 2015 reflecting widening credit spreads, which stabilized in the first quarter of 2016, and lower client activity. Net interest income has trended upwards over the period, largely due to solid volume growth across our Canadian Banking businesses, higher trading-related net interest income, and the inclusion of City National since the first quarter of 2016. Over the period, the impact from foreign exchange translation due to a generally weaker Canadian dollar has also contributed to the increase in revenue. Insurance revenue was primarily impacted by changes in the fair value of investments backing our policyholder liabilities, which is largely offset in PBCAE.

The credit quality of our portfolios has generally remained stable over the period, with an increase in 2016 to PCL recorded in our Capital Markets and Canadian Banking businesses mainly reflecting the impact of the sustained low oil price environment.

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. Over the period, non-interest expense also increased due to higher compliance costs as well as the impact from foreign exchange translation.

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, principally Canadian taxable corporate dividends. Our effective income tax rate has generally been impacted over the period by higher earnings before income taxes, increased earnings in higher tax jurisdictions, and by net favourable tax adjustments.

Financial condition

Condensed balance sheets

The following table shows our condensed balance sheet:

Table 42

(Millions of Canadian dollars)	2016	2015	2014
Assets (1)			
Cash and due from banks	**$ 14,929**	$ 12,452	$ 17,421
Interest-bearing deposits with banks	**27,851**	22,690	8,399
Securities	**236,093**	215,508	199,148
Assets purchased under reverse repurchase agreements and securities borrowed	**186,302**	174,723	135,580
Loans			
Retail	**369,470**	348,183	334,269
Wholesale	**154,369**	126,069	102,954
Allowance for loan losses	**(2,235)**	(2,029)	(1,994)
Segregated fund net assets	**981**	830	675
Other – Derivatives	**118,944**	105,626	87,402
– Other	**73,554**	70,156	56,696
Total assets	**$ 1,180,258**	$ 1,074,208	$ 940,550
Liabilities (1)			
Deposits	**$ 757,589**	$ 697,227	$ 614,100
Segregated fund liabilities	**981**	830	675
Other – Derivatives	**116,550**	107,860	88,982
– Other	**223,764**	196,985	174,431
Subordinated debentures	**9,762**	7,362	7,859
Total liabilities	**1,108,646**	1,010,264	886,047
Equity attributable to shareholders	**71,017**	62,146	52,690
Non-controlling interests	**595**	1,798	1,813
Total equity	**71,612**	63,944	54,503
Total liabilities and equity	**$ 1,180,258**	$ 1,074,208	$ 940,550

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

2016 vs. 2015

Total assets were up $106 billion or 10% from last year. Foreign exchange translation decreased total assets by $4 billion.

Interest-bearing deposits with banks increased $5 billion, largely reflecting higher deposits with the Federal Reserve.

Securities were up $21 billion or 10% compared to last year, largely driven by our acquisition of City National, and higher corporate and government debt securities reflecting our management of liquidity and funding risk and increased client activities, partially offset by lower equity trading positions in support of business activities.

Assets purchased under reverse repurchase agreements (reverse repos) and securities borrowed increased $12 billion or 7%, mainly attributable to higher client activity.

Loans were up $50 billion or 10%, largely due to our acquisition of City National, and continued solid volume growth in residential mortgages and wholesale loans reflecting increased client activity.

Derivative assets were up $13 billion or 13%, mainly attributable to higher fair values on foreign exchange contracts and interest rate swaps, partially offset by higher financial netting and the impact from foreign exchange translation.

Other assets were up $3 billion or 5%, largely reflecting higher goodwill and intangible assets related to our acquisition of City National.

Total liabilities were up $98 billion or 10% from last year. Foreign exchange translation decreased total liabilities by $4 billion.

Deposits increased $60 billion or 9%, mainly driven by our acquisition of City National and growth in retail deposits largely reflecting increased client demand.

Derivative liabilities were up $9 billion or 8%, mainly attributable to higher fair values on foreign exchange contracts and interest rate swaps, partially offset by higher financial netting and the impact from foreign exchange translation.

Other liabilities increased $27 billion or 14%, mainly reflecting higher obligations related to repurchase agreements driven by increased business and client activities.

Total equity increased $8 billion or 12%, largely reflecting earnings, net of dividends, and the issuance of common shares related to our acquisition of City National.

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 effectively 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 for sales and trading activities.

We securitize our credit card receivables, on a revolving basis, through a consolidated structured entity. We securitize our single and multiple-family residential mortgages through the National Housing Act Mortgage-Backed Securities (NHA MBS) program. The mortgages associated with these securitization activities are recorded on our Consolidated Balance Sheets as they do not meet the derecognition criteria. We also securitize mortgages which we purchased from third party lenders. We derecognize these purchased mortgages from our Consolidated Balance Sheets when all the risks and rewards related to these mortgages have been substantially transferred. During 2016, no purchased mortgages were derecognized. During 2015, $967 million of purchased mortgages were derecognized where both the NHA MBS 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 additional details of our securitization activities, refer to Note 6 and Note 7 of our audited 2016 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 2016, there were no securitization activities associated with residential mortgage loans for the Canadian social housing program (2015 – $112 million).

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 risk and rewards of ownership of the securitized assets. During 2016, we securitized $700 million of commercial mortgages (2015 - $195 million). Our continuing involvement with the transferred assets is limited to servicing certain of the underlying commercial mortgages sold. As at October 31, 2016, there were $1.3 billion of commercial mortgages outstanding that we continue to service related to these securitization activities (October 31, 2015 – $1.1 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. We did not securitize bond participation certificates during 2016 or 2015. Our continuing involvement with the transferred assets is limited to servicing the underlying bonds. As at October 31, 2016, there were $81 million of bond participation certificates outstanding related to these prior period securitization activities (October 31, 2015 – $138 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 client's 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 audited 2016 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. We are involved in these conduit markets because our clients value these transactions. Our clients primarily use 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. Fee revenue for all such services amounted to $252 million during the year (2015 – $213 million). We do not maintain any ownership in these multi-seller conduits and have no rights to, or control of, their assets.

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 43**

	2016				2015			
As at October 31 (Millions of Canadian dollars)	**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	**$ 39,462**	**$ 36,494**	**$ 733**	**$ 37,227**	$ 37,770	$ 34,163	$ 764	$ 34,927
Credit enhancement facilities	**2,235**	**2,235**	**–**	**2,235**	2,974	2,843	–	2,843
Total	**$ 41,697**	**$ 38,729**	**$ 733**	**$ 39,462**	$ 40,744	$ 37,006	$ 764	$ 37,770

(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 $11 million (2015 – $19 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 audited 2016 Annual Consolidated Financial Statements for more details.

As at October 31, 2016, the notional amount of backstop liquidity facilities we provide increased by $1,692 million or 4% from last year. The increase in the amount of backstop liquidity facilities provided to the multi-seller conduits as compared to last year reflects increases in the foreign exchange translation and the outstanding securitized assets of the multi-seller conduits. The notional amount of partial credit enhancement facilities we provide decreased by $739 million from last year. The decrease in the credit enhancement facilities reflects fewer transactions requiring program-level credit enhancement due to support provided directly to those transactions and decreased client usage. Total loans extended to the multi-seller conduits under the backstop liquidity facilities decreased by $31 million from last year primarily due to principal repayments which were partially offset by the impact of foreign exchange translation.

Maximum exposure to loss by client type **Table 44**

	2016			2015		
As at October 31 (Millions)	**(US$)**	**(C$)**	**Total (C$)**	(US$)	(C$)	Total (C$)
Outstanding securitized assets						
Credit cards	**$ 5,057**	**$ 510**	**$ 7,292**	$ 4,679	$ 510	$ 6,628
Auto loans and leases	**9,489**	**2,646**	**15,372**	8,606	2,352	13,604
Student loans	**2,352**	**–**	**3,154**	3,473	–	4,541
Trade receivables	**2,002**	**51**	**2,736**	2,175	112	2,956
Asset-backed securities	**547**	**–**	**734**	584	–	764
Equipment receivables	**1,428**	**–**	**1,915**	1,362	–	1,781
Consumer loans	**1,470**	**–**	**1,971**	706	–	923
Dealer floor plan receivables	**760**	**903**	**1,922**	1,261	903	2,552
Fleet finance receivables	**914**	**306**	**1,532**	441	377	954
Insurance premiums	**–**	**163**	**163**	128	153	320
Residential mortgages	**–**	**1,122**	**1,122**	–	1,020	1,020
Transportation finance	**1,041**	**153**	**1,549**	1,204	153	1,727
Total	**$ 25,060**	**$ 5,854**	**$ 39,462**	$ 24,619	$ 5,580	$ 37,770
Canadian equivalent	**$ 33,608**	**$ 5,854**	**$ 39,462**	$ 32,190	$ 5,580	$ 37,770

Our overall exposure increased by 4% compared to last year, reflecting an increase in the outstanding securitized assets of the multi-seller conduits and foreign exchange translation. Correspondingly, total assets of the multi-seller conduits increased by $1,659 million or 4% over last year, primarily due to increases in the Auto loans and leases, Consumer loans and Credit cards asset classes, which were partially offset by decreases in the Student loans and Dealer floor plan 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). 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, 2016, the total asset-backed commercial paper (ABCP) issued by the conduits amounted to $24.7 billion, a decrease of $790 million or 3% from last year. The decrease in the amount of ABCP issued by the multi-seller conduits compared to last year is primarily due to a decrease in client usage partially offset by foreign exchange translation. The rating agencies that rate the ABCP rated 67% (October 31, 2015 – 71%) 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 plan to hold, on each day on and after December 24, 2016, 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, 2016, the fair value of the ABCP purchased in anticipation of the Risk Retention Rules was $670 million (October 31, 2015 – $nil). Based on the current outstanding amount of ABCP issued, we expect to hold approximately $1.2 billion of ABCP by December 24, 2016. 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, 2016, the fair value of our inventory was $5 million, a decrease of $12 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 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, 2016 was $549 million (October 31, 2015 – $546 million). The increase 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 $6.3 million during the year (2015 – $6.9 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, 2016, our maximum exposure to loss from these unconsolidated municipal bond TOB trusts was $1,640 million (October 31, 2015 – $856 million). The increase in our maximum exposure to loss relative to last year is primarily due to the addition of new trusts and the impact of foreign exchange translation. Fee revenue from provision of liquidity facilities to these entities reported in Non-interest income was $4.7 million during the year (2015 – $3.7 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, 2016, our maximum exposure to loss associated with the outstanding senior warehouse financing facilities was $141 million (October 31, 2015 – $444 million). The decrease in our maximum exposure to loss relative to last year is related to the issuance of term collateralized loan obligations where a portion of the proceeds were used to repay some of the senior warehouse financing that we provided and a decrease in the outstanding drawings on certain financing facilities.

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, 2016, our maximum exposure to loss was $2.6 billion (October 31, 2015 – $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, 2016, our maximum exposure to these funds was $764 million (October 31, 2015 – $744 million). The increase in our maximum exposure compared to last year is primarily due to the impact of foreign exchange translation.

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, 2016, our maximum exposure to loss in these entities was $9 billion (October 31, 2015 – $9.7 billion). The decrease in our maximum exposure to loss compared to last year reflects a reduction in the securitized assets in these entities partially offset by foreign currency translation. Interest and non-interest income earned in respect of these investments was $95 million (2015 – $56 million).

Guarantees, retail and commercial commitments

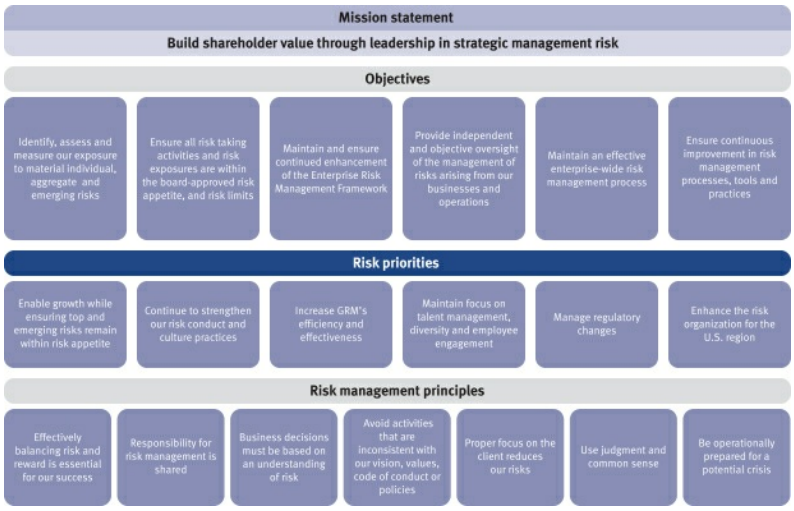
We provide guarantees and commitments to our clients that expose us to liquidity and funding risks. Our maximum potential amount of future payments in relation to our commitments and guarantee products as at October 31, 2016 amounted to $340 billion compared to $315 billion last year. The increase compared to last year relates primarily to business growth, the acquisition of City National, and the impact of foreign exchange translation in other credit-related commitments and securities lending indemnifications. Refer to Liquidity and funding risk and Note 26 to our audited 2016 Annual Consolidated Financial Statements for details regarding our guarantees and commitments.

Risk management

Overview

The ability to manage risk well 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 throughout 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. In order to avoid excessive concentration of risks, we strive to diversify our business lines, products and sector exposures.



2016 Accomplishments

Throughout 2016, we have:

- Kept our risk profile within our risk appetite;
- Maintained strong credit quality, notwithstanding sustained low energy prices impacting the oil & gas sector and oil-exposed regions;
- Maintained strong capital and liquidity ratios;
- Avoided major operational risk events;
- Enhanced stress testing capabilities and risk analysis frameworks;
- Increased focus on further strengthening risk conduct and culture; and
- Enhanced the risk organization for the U.S.

CET1 ratio



Our capital position was strong with a Basel III CET1 ratio well in excess of regulatory requirements

Total Capital ratio



Our total capital ratio increased relative to last year mainly due to strong internal capital generation

Total PCL ratio



Our total PCL ratio remained within historical norms, up modestly compared to last year primarily as a result of the low oil price environment

GIL ratio



The quality of our credit portfolio remained high, notwithstanding the low oil prices, which led to higher impaired loans in the oil and gas sector

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 enterprise 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.

Top and emerging risks occur as a result of exogenous factors, such as changes in the macroeconomic or regulatory environment, or endogenous factors, such as changes to our strategic imperatives, or failure to adapt to an evolving competitive or operational environment.

A top risk is an existing, significant risk that can potentially affect our earnings or capital within a one-year time horizon.

An emerging risk has a lower probability of occurring within a one-year horizon, but, in the event it materializes, can have a significant adverse impact on our ability to achieve our goals. Emerging risks are defined as “new” risks, “familiar risks in new or unfamiliar conditions”, or “existing risks that are expected to increase in significance” that have the potential of creating new or changing top risks within the next annual reporting cycle that may or could prevent us from achieving our business objectives.

Top Risks	Trend	Commentary
u *Risk did not increase in 2016*		p *Risk heightened during 2016* p *Top Risk in 2016*
Global uncertainty	p	Uncertainty around the potential for a global recession remained heightened during 2016. Concerns remain around the social, political and economic impacts of mass immigration in continental Europe led by the Middle East's changing political landscape, Russia-Ukraine tension and territorial disputes between Japan and China. Increasing income inequality, unemployment and decline in living standards against the backdrop of growing foreign ownership of strategic assets is driving an increase in nationalism and extremist political movements around the globe. Slow global growth and the attempts of central banks around the world to use monetary policy to stimulate their economies, even using negative interest rates, remains a key risk. Following the recent U.S. election, drastic policy changes including trade and fiscal policy, could be a key risk that may result in economic uncertainty for the U.S. and its trading partners, including Canada.
Brexit	p	The Brexit vote has resulted in increased concerns about the economic, legal, political, regulatory and trade consequences for the U.K. and Europe. We will be monitoring negotiations between the U.K., the EU and individual member states closely to assess the potential impacts to our business strategy in the U.K. and in Europe.
Oil & gas	u	The oil & gas sector experienced a partial recovery during 2016, easing pressure on Provision for Credit Losses (PCL) in the latter half of the year. However, the risks associated with sustained low oil prices remain. The low oil prices might lead to additional PCL in the longer term. We have performed a number of low oil price stress tests, which focus specifically on the impact to our retail and wholesale portfolios. In our view, our exposure to weak oil and gas prices remains within our risk appetite.
Cyber risk	p	Information and cybersecurity continue to be an increasingly problematic issue, not only for the financial services sector, but for other industries in Canada and around the globe. The volume and sophistication of cyber-attacks in the industry continue to increase and adversaries are becoming more organized. We continue to see challenges in the management of IT Risk with respect to third party hosted applications, eMessaging and social media related risks. We continue to leverage and mature advancements in cyber defense capabilities 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.
Anti-money laundering	p	We are subject to a dynamic set of anti-money laundering/anti-terrorist financing, economic sanctions and anti-bribery/anti-corruption (AML) laws and regulations across the multiple jurisdictions in which we operate. As the scope of criminal activities such as tax evasion, human trafficking, bribery and corruption continues to expand, regulators worldwide are intensifying regulatory requirements and increasing enforcement actions and penalties for those who fail to comply. We are committed to the management of AML risk and have implemented advanced and evolving AML policies, processes and controls to mitigate the risk of money laundering activities and meet our regulatory obligations to deter, detect and report such activities.
Exposure to more volatile sectors	u	We manage risks associated with our wholesale loan portfolio by focusing on diversification, driven by limits on single name, country and industry exposures across all businesses, portfolios and transactions. We continue to adhere to strict lending standards and stress test our portfolio to assist in evaluating the potential impact of severe economic conditions.

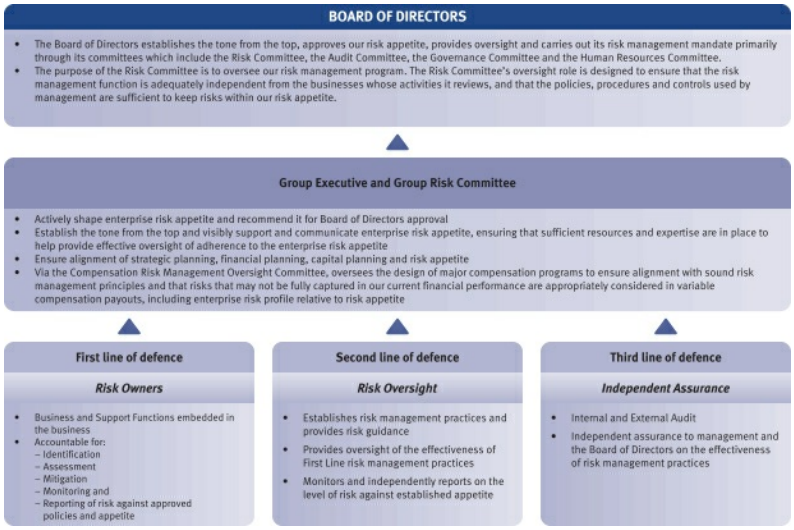
Emerging Risks	Trend	Commentary
u *Risk did not increase in 2016*		p *Risk heightened during 2016* p *New Emerging Risk in 2016*
Technological innovation and new entrants	u	The financial system continues to be subject to rapid technological change resulting in changing consumer habits and additional regulatory expectations and oversight responsibilities. New Fintech entrants have the potential to disrupt existing financial services value chains. These companies offer new payment methods and alternative lending solutions. In response, we have made digital and IT innovation a key strategic priority.
Increasing complexity of regulation	u	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 significant impact on our businesses and could affect their strategies.
Data management	p	Financial institutions are subject to increased informational demands from regulators and other stakeholders. We are continually investing in building better data management capabilities, including data ownership and stewardship, data architecture, metadata management, and data delivery, in order to enable consistent data aggregation, reporting and management.
Litigation and administrative penalties	u	Some financial institutions have been affected by inadequate internal controls on risky or unlawful behaviour, including not conducting adequate due diligence on new clients, new products, misrepresentation, and not addressing customer privacy amid rapid increases in the scope and volume of personal data, leading to increased scrutiny from regulators.

Enterprise risk management

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 three lines of defence governance model to manage risks across the enterprise.



Risk Appetite

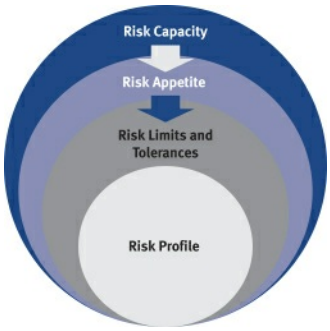
Our risk appetite is the amount and type of risk that we are able and willing to accept in the pursuit of its business objectives. The goal in managing risk is to protect us from an unacceptable loss or an undesirable outcome with respect to earnings volatility, capital adequacy or liquidity, while supporting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

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

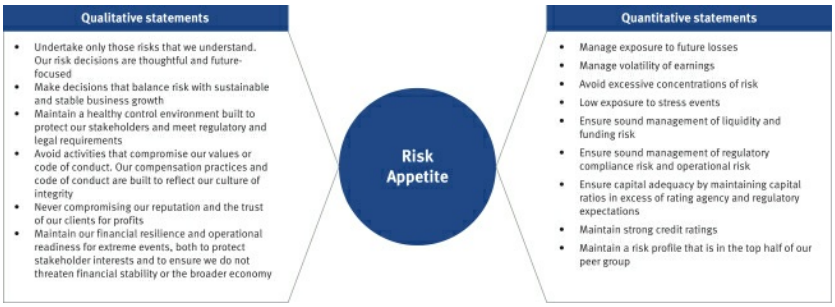
1) The amount of "earnings at risk" that is determined to be acceptable over an economic cycle and including periods of moderate stress, using an expected future loss lens and considering potential revenue and expense contributions to earnings volatility;
2) The amount of "capital at risk" that is determined 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 both the minimum and maximum amount of risk we are willing to accept given our financial strength, corporate objectives and business strategies.
- Set risk limits and tolerances to ensure that risk-taking activities are within 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.
- 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 risk profile from surpassing risk appetite.



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.



The Enterprise Risk Appetite Framework is structured in such a way that it can be applied at the enterprise, business segment, business unit and legal entity levels. The risk appetite is integrated into our business strategies and capital plan. We also ensure that the business strategy aligns with the enterprise and business segment level risk appetite.

Risk Conduct and Culture

We define our risk conduct and culture as a shared set of behavioural norms that sustains 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 have adopted the Financial Stability Board's four fundamental practices as foundational to an effective risk conduct and culture in order to enable and reward the desired risk behaviours and outcomes, namely:

- Tone from the top;
- Accountability;
- Effective communication and challenge; and
- Incentives that reinforce desired risk management behaviours.

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:



Sustaining and strengthening our risk conduct and culture relies upon effective linkages between our risk appetite, our enterprise-wide risk management program, our Code of Conduct, values, and human resources policies and practices. Regular assessment and monitoring is in place to identify strengths and weaknesses and areas for remediation. Our objective is to continually assess the effectiveness of our risk conduct and culture and to identify issues that could be signs of cultural problems and which, if not addressed, could undermine our long-term success, and, potentially jeopardize our safety and soundness.

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. Our measurement models and techniques are continually subject to independent assessment for appropriateness and reliability. 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.

Quantifying expected loss

Expected loss 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 period of time. For credit risk, the key parameters used to measure our exposure to expected loss are probability of default, loss given default, and exposure at default. For market risk, a statistical technique known as Value-at-Risk (VaR) is used to measure losses under normal market conditions.

Quantifying unexpected loss

Unexpected loss is used to assess capital at risk and is a statistical estimate of the amount by which actual earnings depart from the expected, over a specified time horizon, measured at a specified level of confidence. We hold capital to withstand these unexpected losses, should they occur. For further details, refer to the Capital management section.

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 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, Canadian recessions, and energy price 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, our 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 at both the consolidated and subsidiary levels.

Back-testing

We back-test many market and credit risk parameters, including probability of default, loss given default, and usage given default. Back-testing 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.

Validation of measurement models

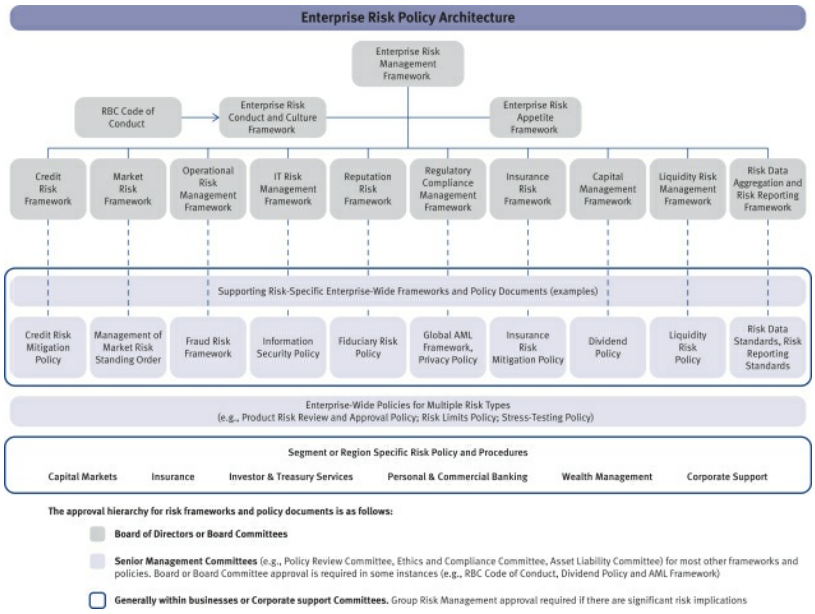
Models are widely used for many purposes at RBC, including the valuation of financial products and the measurement and management of different types of risk. Prior to their use, models are subject to an independent validation and approval by our model risk management function, a team of modelling professionals with reporting lines independent of those of the model developers and model users. The validation ensures that models are conceptually sound and capable of fulfilling their intended use. In addition to independently validating models prior to use, our model risk function provides controls that span the life-cycle of a model, including model change management procedures, requirements for ongoing monitoring, and annual assessments to ensure each model continues to be applicable.

Risk control

Our enterprise-wide risk management approach is supported by a comprehensive set of risk controls. Our risk management frameworks and policies are organized into the following five levels:

- **Level 1: Enterprise Risk Management Framework** provides an overview of our enterprise-wide program for identifying, assessing, measuring, controlling, monitoring and reporting on the significant risks we face. This framework is underpinned by our Risk Appetite Framework and Risk Conduct and Culture Framework.
- **Level 2: Risk-Specific Frameworks** elaborate on each specific risk type and the mechanisms for identifying, measuring, monitoring and reporting of our principal risks; key policies; and roles and responsibilities.
- **Level 3: Enterprise Risk Policies** articulate minimum requirements, within which businesses and employees must operate.
- **Level 4: "Multi-risk" Enterprise Risk Policies** govern activities such as product risk review and approval, stress testing, risk limits, risk approval authorities and model risk management.
- **Level 5: Business Segments and Corporate Support – Specific Policies and Procedures** are established to manage the risks that are unique to their operations.

Risk controls are anchored by our Enterprise Risk Management and Risk-Specific Frameworks. These frameworks 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.



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 & 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, CAO & 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 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 a more 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.

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:

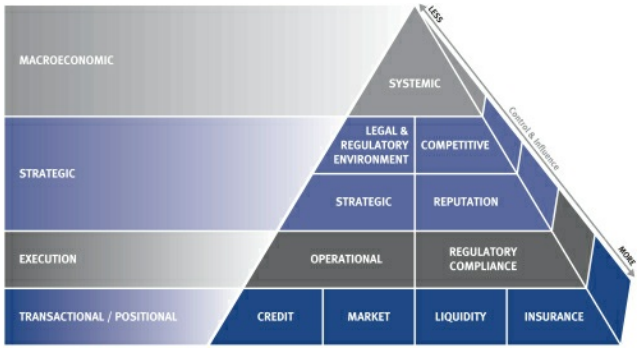
- *Risk Drivers* – Key factors that would have a strong influence on whether or not one or more of our risks will materialize, and
- *Control and Influence* – The risk types are organized vertically from the top of the pyramid to its base according to the relative degree of control and influence we are considered to have over each risk driver.

Risk Drivers

- 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 a rapid deterioration in the Canadian housing market, severe North American recession and a downturn in China. Resultant impacts can materialize as loss of revenue, as well as realization of credit, market or operational risk losses.
- Strategic: Business strategy is a major driver of our risk appetite and consequently 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.
- 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.
- 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.

The base of the pyramid – 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 greater level of control and influence, are ranked higher on the pyramid than the other highly controllable risks. This ranking acknowledges the level of controllability associated with people, systems and external events.

The top of the pyramid – 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 impacting us. 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.



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 2016 Annual Consolidated Financial Statements.

Credit risk

Credit risk is the risk of loss associated with an obligor's potential inability or unwillingness to fulfill its contractual obligations. 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 failure to effectively manage credit risk across all our products, services and activities can have a direct, immediate and material impact on our earnings and reputation.

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 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 Group Chief Risk Officer has been empowered to further delegate credit risk approval authorities to individuals within Group Risk Management, the business segments, and Corporate Support as necessary.

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.

We balance our risk and return by:
- Ensuring credit quality is not compromised for growth;
- Mitigating credit risks in transactions, relationships and portfolios;
- Using our 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 our values, Code of Conduct or policies.

Risk measurement – Credit risk

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 different risk measurement processes for our wholesale and retail credit portfolios. The wholesale portfolio comprises businesses, sovereigns, public sector entities, banks and other financial institutions, and certain individuals and small businesses that are managed on an individual client basis. The retail portfolio is comprised of residential mortgages, personal, credit card, and small business loans, which are managed on a pooled basis. Credit risk rating systems are designed to assess and quantify the risk inherent in credit activities in an accurate and consistent manner.

In measuring credit risk and setting 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.

Economic capital, which is our internal quantification of risks, is used extensively 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.

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

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, consistent with the external rating agencies. The following table aligns the relative rankings of our 22-grade internal risk ratings with the ratings used by S&P and Moody's.

Internal ratings map* **Table 45**

Ratings	BRR	S&P	Moody's	Description
1	1+	AAA	Aaa	
2	1H	AA+	Aa1	
3	1M	AA	Aa2	
4	1L	AA-	Aa3	
5	2+H	A+	A1	Investment Grade
6	2+M	A	A2	
7	2+L	A-	A3	
8	2H	BBB+	Baa1	
9	2M	BBB	Baa2	
10	2L	BBB-	Baa3	
11	2-H	BB+	Ba1	
12	2-M	BB	Ba2	
13	2-L	BB-	Ba3	
14	3+H	B+	B1	
15	3+M	B	B2	Non-investment Grade
16	3+L	B-	B3	
17	3H	CCC+	Caa1	
18	3M	CCC	Caa2	
19	3L	CCC-	Caa3	
20	4	CC	Ca	
21	5	C	C	Impaired
22	6	Bankruptcy	Bankruptcy	

* This table represents an integral part of our 2016 Annual Consolidated Financial Statements.

Each credit facility is assigned an LGD rate that is largely driven by factors that impact the extent of losses in the event the obligor defaults; including seniority of debt, collateral security, and the industry sector in which the obligor operates. Estimated LGD rates draw primarily on internal loss experience since the late 1990s. 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 and the type of obligor. 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.

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 derivatives (e.g., precious metal and commodities). For further details on our derivative instruments and credit risk mitigation, refer to Note 8 of our 2016 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 (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. Credit scores are one of the factors employed in the acquisition of new clients and management of existing clients.

Retail exposures are managed on a pooled basis, with each pool consisting of a group or segment of exposures that possess similar homogeneous characteristics. Criteria used to pool exposures for risk quantification include behavioural score, product type (mortgages, credit cards, lines of credit and instalment loans), collateral type (chattel, liquid assets and real estate), utilization rate, loan-to-value, and the delinquency status (performing, delinquent and default) of the exposure. Regular monitoring and periodic adjustments & alignments are conducted to ensure that this process provides for a meaningful differentiation of risk.

Credit risk parameters (PD and EAD) are estimated based on pools which consider borrower and transaction characteristics, including behavioural credit score, product type, utilization rate and delinquency status. LGD parameter estimates are based on transaction specific factors, including products, loan-to-value and collateral types. All parameters are determined based on over 10 years of historical economic losses with a high degree of granularity and additional margins of conservatism. Parameters are back-tested regularly by the retail Basel team and validated by an independent team within Group Risk Management.

The following table maps PD bands to various risk levels:

Internal ratings map* **Table 46**

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 2016 Annual Consolidated Financial Statements.

Risk control – Credit risk

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.

Credit policies are an integral component of our Credit Risk Framework and set out the minimum requirements for the management of credit risk as follows:

Credit risk assessment

- Mandatory use of credit risk rating and scoring systems.
- Consistent credit risk assessment criteria.
- Standard content requirements in credit application documents.

Credit risk mitigation

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 finance 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 are compliant with regulatory requirements that govern residential mortgage underwriting practices, including loan-to-value parameters and property valuation requirements. For further information regarding residential mortgages, refer to table 55.

Credit derivatives

- We use credit derivatives as a tool to mitigate industry sector concentration and single-name exposure. For a more detailed description of the types of credit derivatives we enter into and how we manage related credit risk, refer to Note 8 of our 2016 Annual Consolidated Financial Statements.

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, the bank's policy and the customer's willingness and capacity to meet the new arrangement. During 2016, some concessions were made to clients affected by low oil prices, the associated slowdown in Alberta's economy and the wildfires in Fort McMurray; however, the overall impact of these concessions on our financial results was minimal.

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 portfolio management

- 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.

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 lending-related and other, and 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 amount which represents the credit equivalent amount, which is defined by OSFI as the replacement cost plus an add-on amount for potential future credit exposure.

Gross credit risk exposure by portfolio and sector* **Table 47**

(Millions of Canadian dollars)	As at October 31 2016						October 31 2015					
	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)
Residential mortgages	$ 254,998	$ 1,063	$ 214	$ –	$ –	$ 256,275	$ 233,975	$ –	$ 206	$ –	$ –	$ 234,181
Personal	93,466	82,527	145	–	–	176,138	94,346	78,885	154	–	–	173,385
Credit cards	17,128	24,571	–	–	–	41,699	15,859	24,827	–	–	–	40,686
Small business (5)	3,878	6,188	5	–	–	10,071	4,003	5,370	9	–	–	9,382
Retail	$ 369,470	$ 114,349	$ 364	$ –	$ –	$ 484,183	$ 348,183	$ 109,082	$ 369	$ –	$ –	$ 457,634
Business (5)												
Agriculture	$ 6,515	$ 1,310	$ 74	$ –	$ 109	$ 8,008	$ 6,057	$ 1,279	$ 80	$ –	$ 86	$ 7,502
Automotive	7,279	5,785	567	–	497	14,128	6,614	5,104	407	–	984	13,109
Consumer goods	10,052	9,562	756	–	551	20,921	7,146	7,093	594	–	470	15,303
Energy												
Oil & Gas	6,259	10,747	1,656	–	1,198	19,860	7,691	13,274	1,330	–	839	23,134
Utilities	7,680	13,694	3,496	–	1,748	26,618	5,162	13,389	3,149	60	1,482	23,242
Forest products	1,099	561	85	–	27	1,772	1,169	535	108	–	40	1,852
Industrial products	5,508	7,757	546	–	632	14,443	4,725	5,418	513	–	538	11,194
Mining & metals	1,455	3,640	1,135	–	144	6,374	1,402	3,883	906	–	255	6,446
Non-bank financial services	8,408	13,149	15,830	249,732	41,381	328,500	6,428	13,060	18,002	201,845	29,769	269,104
Real estate & related	40,419	11,215	1,847	4	499	53,984	33,802	9,210	1,910	63	373	45,358
Technology & media	11,019	14,758	873	470	1,832	28,952	6,599	14,182	574	6	1,703	23,064
Transportation & environment	6,060	4,393	3,603	–	1,637	15,693	5,907	4,300	2,960	–	1,474	14,641
Other sectors	42,948	19,607	18,647	2,786	3,391	87,379	35,133	17,166	15,620	4,915	15,386	88,220
Sovereign (5)	10,581	6,972	84,017	38,707	17,319	157,596	9,887	5,614	57,413	30,871	10,162	113,947
Bank (5)	1,930	1,815	119,324	104,314	25,600	252,983	1,800	1,015	86,106	102,371	27,221	218,513
Wholesale	$ 167,212	$ 124,965	$252,456	$ 396,013	$ 96,565	$ 1,037,211	$ 139,522	$ 114,522	$ 189,672	$ 340,131	$ 90,782	$ 874,629
Total exposure	$ 536,682	$ 239,314	$252,820	$ 396,013	$ 96,565	$ 1,521,394	$ 487,705	$ 223,604	$ 190,041	$ 340,131	$ 90,782	$ 1,332,263

* This table represents an integral part of our 2016 audited 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 HELOC are included in Personal.

(5) Refer to Note 5 of our audited 2016 Annual Consolidated Financial Statements for the definitions of these terms.

2016 vs. 2015

Total gross credit risk exposure increased $189 billion or 14% from last year, primarily due to the inclusion of City National, an increase in repo-style transactions and Other exposure related to AFS debt securities, higher deposits balances and volume growth in residential mortgages. The increase in wholesale loans mainly reflected increased client activity, as well as the impact from foreign exchange translation.

Retail exposure increased $27 billion or 6%, mainly due to the inclusion of City National and continued volume growth in residential mortgages and credit cards.

Wholesale exposure increased $163 billion or 19%, primarily attributable to the inclusion of City National, an increase in repo-style transactions, higher Other exposure related to corporate and government AFS debt securities and higher deposits with the Federal Reserve reflecting our management of liquidity and funding risk. Volume growth in wholesale loans across various industry sectors, higher fair values on foreign exchange contracts and interest rate swaps, and the impact from foreign exchange translation also contributed to the increase. Wholesale loan utilization was 40%, up from 37% last year.

As at October 31, 2016, our loans and acceptances exposure to oil and gas was $17 billion (October 31, 2015 – $21 billion); which is comprised of outstanding loans of $6 billion (October 31, 2015 – $8 billion), and undrawn commitments of $11 billion (October 31, 2015 – $13 billion). The oil and gas portfolio represents 2.19% (October 31, 2015 – 2.95%) of our total loan and acceptances portfolio. Of the $17 billion exposure, 42% was to investment grade while 58% was to non-investment grade counterparties (October 31, 2015 – 46% and 54%, respectively).

Our AFS Securities (banking book) exposures are rated 95% investment grade and 5% non-investment grade.

Gross credit risk exposure by geography* (1) **Table 48**

(Millions of Canadian dollars)	As at October 31 2016 Lending-related and other – Loans and acceptances – Outstanding	Undrawn commitments	Other	Trading-related – Repo-style transactions	Derivatives	Total exposure	As at October 31 2015 Lending-related and other – Loans and acceptances – Outstanding	Undrawn commitments	Other	Trading-related – Repo-style transactions	Derivatives	Total exposure
Canada	$ 430,616	$ 151,481	$ 81,800	$ 76,094	$ 27,647	$ 767,638	$ 414,427	$ 144,352	$ 70,774	$ 64,855	$ 27,272	$ 721,680
U.S.	76,481	69,006	81,168	208,759	14,315	449,729	40,186	60,031	50,915	179,021	14,023	344,176
Europe	14,886	15,367	74,547	71,722	48,318	224,840	17,706	15,574	52,294	58,900	44,480	188,954
Other International	14,699	3,460	15,305	39,438	6,285	79,187	15,386	3,647	16,058	37,355	5,007	77,453
Total Exposure	$ 536,682	$ 239,314	$252,820	$ 396,013	$ 96,565	$1,521,394	$ 487,705	$ 223,604	$190,041	$ 340,131	$ 90,782	$1,332,263

* This table represents an integral part of our 2016 audited Annual Consolidated Financial Statements.
(1) Geographic profile is based on country of residence of the borrower.

2016 vs. 2015
Canada exposure increased $46 billion or 6% compared to the prior year, primarily due to higher loans and acceptances and growth in repo-style transactions.

U.S. exposure increased $106 billion or 31% compared to the prior year, mainly due to the inclusion of City National, growth in repo-style transactions, higher Other exposure related to AFS debt securities, higher deposits with the Federal Reserve, and the impact from foreign exchange translation.

Europe exposure increased $36 billion or 19% compared to the prior year, mainly due to an increase in repo-style transactions, higher Other exposure related to AFS debt securities, and increased deposits with central banks.

Other International exposure increased $2 billion or 2% compared to the prior year.

Loans and acceptances outstanding and undrawn commitments* (1), (2) **Table 49**

(Millions of Canadian dollars)	As at October 31 2016 – Low risk	Medium risk	High risk	Impaired	Total	As at October 31 2015 – Low risk	Medium risk	High risk	Impaired	Total
Retail (3)										
Residential mortgages	$ 231,399	$ 12,750	$ 2,090	$ 667	$ 246,906	$ 218,151	$ 13,080	$ 2,098	$ 646	$ 233,975
Personal	159,841	10,624	2,768	300	173,533	157,996	12,020	2,916	299	173,231
Credit cards	34,758	5,342	1,437	–	41,537	34,547	4,772	1,367	–	40,686
Small business	7,148	1,201	1,671	46	10,066	6,878	1,047	1,403	45	9,373
	$ 433,146	$ 29,917	$ 7,966	$ 1,013	$ 472,042	$ 417,572	$ 30,919	$ 7,784	$ 990	$ 457,265

(Millions of Canadian dollars)	As at October 31 2016 – Investment grade	Non-investment grade	Impaired	Total	As at October 31 2015 – Investment grade	Non-investment grade	Impaired	Total
Wholesale (4)								
Business	$ 107,510	$ 132,967	$ 2,339	$ 242,816	$ 105,871	$ 128,564	$ 1,293	$ 235,728
Sovereign	15,939	786	–	16,725	14,704	797	–	15,501
Bank	1,881	943	2	2,826	2,475	338	2	2,815
Total	$ 125,330	$ 134,696	$ 2,341	$ 262,367	$ 123,050	$ 129,699	$ 1,295	$ 254,044

* This table represents an integral part of our audited 2016 Annual Consolidated Financial Statements.
(1) This table represents our retail and wholesale loans and acceptances outstanding and undrawn commitments by portfolio and risk category, excluding City National exposures of $41.6 billion.
(2) The amounts in the table are before allowance for impaired loans.
(3) Includes undrawn commitments of $1.0 billion, $82.4 billion, $24.6 billion, and $6.2 billion for Residential mortgages, Personal, Credit cards and Small business, respectively (October 31, 2015 – $nil, $78.9 billion, $24.8 billion and $5.4 billion, respectively).
(4) Includes undrawn commitments of $111.3 billion, $7.0 billion, and $1.2 billion for Business, Sovereign and Bank, respectively (October 31, 2015 – $107.9 billion, $5.6 billion, and $1.0 billion, respectively).

2016 vs. 2015
Growth in retail exposures was largely attributable to continued volume growth in residential mortgages and credit cards. Growth in wholesale exposures mainly reflects increased volumes across various industry sectors in investment grade and non-investment grade categories, as well as the impact from foreign exchange translation.

Net European exposure by country (1), (2) **Table 50**

(Millions of Canadian dollars)	As at October 31 2016 Loans outstanding	Securities (3)	Repo-style transactions	Derivatives	Total	October 31 2015 Total
U.K.	$ 8,027	$ 5,409	$ 1,102	$ 3,418	$ 17,956	$ 20,964
Germany	783	10,014	1	475	11,273	9,496
France	1,066	6,878	1	453	8,398	4,533
Total U.K., Germany, France	$ 9,876	$ 22,301	$ 1,104	$ 4,346	$ 37,627	$ 34,993
Greece	$ –	$ –	$ –	$ –	$ –	$ –
Ireland	684	32	80	84	880	1,319
Italy	54	58	–	8	120	100
Portugal	6	–	–	10	16	9
Spain	339	51	–	56	446	439
Total Peripheral (4)	$ 1,083	$ 141	$ 80	$ 158	$ 1,462	$ 1,867
Luxembourg	$ 898	$ 428	$ 5	$ 53	$ 1,384	$ 4,890
Netherlands	1,067	6,757	7	743	8,574	4,983
Norway	227	3,709	–	9	3,945	4,886
Sweden	258	3,888	1	21	4,168	3,376
Switzerland	1,178	766	97	230	2,271	1,753
Other	1,447	1,399	32	104	2,982	3,345
Total Other Europe	$ 5,075	$ 16,947	$ 142	$ 1,160	$ 23,324	$ 23,233
Net exposure to Europe (5), (6)	$ 16,034	$ 39,389	$ 1,326	$ 5,664	$ 62,413	$ 60,093

(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 $64.0 billion against repo-style transactions (October 31, 2015 – $58 billion) and $15.7 billion against derivatives (October 31, 2015 – $10.7 billion).
(3) Securities include $11.1 billion of trading securities (October 31, 2015 – $12.8 billion), $12.3 billion of deposits (October 31, 2015 – $11.5 billion), and $15.9 billion of AFS securities (October 31, 2015 – $13.0 billion).
(4) Gross credit risk exposure to peripheral Europe is comprised of Greece $nil (October 31, 2015 – $nil), Ireland $18.9 billion (October 31, 2015 – $11.7 billion), Italy $0.3 billion (October 31, 2015 – $0.3 billion), Portugal $0.1 billion (October 31, 2015 – $nil), and Spain $1.1 billion (October 31, 2015 – $1.2 billion).
(5) Excludes $1.9 billion (October 31, 2015 – $2.6 billion) of exposures to supranational agencies.
(6) Reflects $1.5 billion of mitigation through credit default swaps, which are largely used to hedge single name exposures and market risk (October 31, 2015 – $1.8 billion).

2016 vs. 2015
Net credit risk exposure to Europe increased $2.3 billion from last year, largely driven by increased exposure to France, the Netherlands and Germany, partially offset by a decrease in exposure to Luxembourg, the U.K. and Norway. Our net exposure to peripheral Europe, which includes Greece, Ireland, Italy, Portugal and Spain, remained minimal, with total outstanding exposure decreasing $0.4 billion during the year to $1.5 billion.

Our European corporate loan book is managed on a global basis and the underwriting standards for this loan book reflect the same approach to the use of our balance sheet as we have applied in both Canada and the U.S. PCL taken during the year on this portfolio was not material. The gross impaired loans ratio of this loan book was 1.1%, up from 0.6% last year.

Net European exposure by client type **Table 51**

(Millions of Canadian dollars)	As at October 31 2016 U.K.	Germany	France	Total U.K., Germany, France	Greece	Ireland	Italy	Portugal	Spain	Total Peripheral	Other Europe	Total Europe	October 31 2015 Total Europe
Financials	$ 8,372	$ 8,507	$ 1,176	$ 18,055	$ –	$ 158	$ 64	$ 10	$ 27	$ 259	$11,347	$29,661	$ 27,835
Sovereign	1,746	1,671	6,762	10,179	–	12	12	–	–	24	7,139	17,342	14,815
Corporate	7,838	1,095	460	9,393	–	710	44	6	419	1,179	4,838	15,410	17,443
Total	$ 17,956	$ 11,273	$ 8,398	$ 37,627	$ –	$ 880	$120	$ 16	$ 446	$ 1,462	$23,324	$62,413	$ 60,093

2016 vs. 2015
Our net exposure to Sovereign increased $2.5 billion, mainly due to increases in France, Germany and Other Europe, partly offset by decreases in the U.K. The net exposure to Financials increased $1.8 billion, mostly in Germany and the U.K., partly offset by decreases in Other Europe. The net exposure to Corporate decreased $2.0 billion, mainly in the U.K. and Germany.

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 52**

(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	

(Millions of Canadian dollars, except percentage amounts)	As at October 31, 2015							
	Residential mortgages (1)						Home equity lines of credit (2)	
	Insured (3)		Uninsured		Total		Total	
Region (4)								
Canada								
Atlantic provinces	$ 6,856	55%	$ 5,586	45%	$ 12,442		$ 2,060	
Quebec	12,414	46	14,621	54	27,035		4,157	
Ontario	36,555	39	58,036	61	94,591		16,785	
Alberta	19,872	55	16,423	45	36,295		7,189	
Saskatchewan and Manitoba	7,690	48	8,174	52	15,864		2,751	
B.C. and territories	15,755	36	27,555	64	43,310		9,085	
Total Canada (5)	$ 99,142	43%	$ 130,395	57%	$ 229,537		$ 42,027	
U.S.	–	–	772	100	772		334	
Other International	14	–	3,202	100	3,216		3,107	
Total International	$ 14	–	$ 3,974	100%	$ 3,988		$ 3,441	
Total	$ 99,156	42%	$ 134,369	58%	$ 233,525		$ 45,468	

(1) The residential mortgages amounts exclude our third-party mortgage-backed securities (MBS) of $84 million (2015 – $450 million).
(2) HELOC includes 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 $242 billion (2015 – $230 billion) is largely comprised of $217 billion (2015 – $205 billion) of residential mortgages and $6 billion (2015 – $5 billion) of mortgages with commercial clients, of which $3 billion (2015 – $3 billion) are insured mortgages, both in Canadian Banking, and $19 billion (2015 – $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, 2016, home equity lines of credit in Canadian Banking were $41 billion (2015 – $42 billion). Approximately 98% of these home equity lines of credit (2015 – 98%) are secured by a first lien on real estate, and 7% of the total homeline clients (2015 – 8%) 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 53

	As at					
	October 31 2016			October 31 2015		
	Canada	**U.S. and Other International**	**Total**	Canada	U.S. and Other International	Total
Amortization period						
£ 25 years	**74%**	**40%**	**72%**	75%	77%	75%
> 25 years £ 30 years	**25**	**58**	**27**	23	23	23
> 30 years £ 35 years	**1**	**2**	**1**	2	–	2
> 35 years	**–**	**–**	**–**	–	–	–
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 54

	October 31 2016		October 31 2015	
	Uninsured		Uninsured	
	Residential mortgages (1)	**Homeline products** (2)	Residential mortgages (1)	Homeline products (2)
Region (3)				
Atlantic provinces	**73%**	**74%**	74%	75%
Quebec	**71**	**74**	71	73
Ontario	**70**	**69**	70	70
Alberta	**73**	**72**	73	73
Saskatchewan and Manitoba	**74**	**74**	74	75
B.C. and territories	**68**	**65**	69	66
U.S.	**72**	**n.m.**	72	n.m.
Other International	**63**	**n.m.**	61	n.m.
Average of newly originated and acquired for the year (4), (5)	**71%**	**69%**	71%	70%
Total Canadian Banking residential mortgages portfolio (6)	**54%**	**51%**	55%	54%

(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

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.

Credit quality performance

Provision for (recovery of) credit loss		Table 55
(Millions of Canadian dollars, except percentage amounts)	**2016**	2015
Personal & Commercial Banking	**$ 1,122**	$ 984
Wealth Management	**48**	46
Capital Markets	**327**	71
Corporate Support and Other (1)	**49**	(4)
Total PCL	**$ 1,546**	$ 1,097
Canada (2)		
Residential mortgages	**$ 42**	$ 27
Personal	**459**	393
Credit cards	**435**	371
Small business	**34**	32
Retail	**970**	823
Wholesale	**213**	116
PCL on impaired loans	**1,183**	939
U.S. (2), (3)		
Retail	**$ 1**	$ 1
Wholesale	**227**	40
PCL on impaired loans	**228**	41
Other International (2), (3)		
Retail	**$ 41**	$ 21
Wholesale	**44**	96
PCL on impaired loans	**85**	117
PCL on loans not yet identified as impaired	**50**	–
Total PCL	**$ 1,546**	$ 1,097
PCL ratio		
Total PCL ratio	**0.29%**	0.24%
PCL on impaired loans ratio	**0.28%**	0.24%
Personal & Commercial Banking	**0.29%**	0.27%
Canadian Banking	**0.29%**	0.25%
Caribbean Banking	**0.53%**	0.85%
Wealth Management	**0.10%**	0.26%
PCL ratio – loans	**0.08%**	0.26%
PCL ratio – acquired credit-impaired loans	**0.02%**	n.a.
Capital Markets	**0.37%**	0.09%

(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.
n.a. not applicable

2016 vs. 2015

Total PCL increased $449 million, or 41% from the prior year. The PCL ratio of 29 bps increased 5 bps.

PCL in Personal & Commercial Banking increased $138 million or 14%, and the PCL ratio of 29 bps increased 2 bps, largely due to higher provisions in our Canadian personal and commercial lending portfolios and higher write-offs in our Canadian credit cards portfolio. These factors were partially offset by lower PCL in our Caribbean portfolios.

PCL in Wealth Management increased $2 million mainly reflecting provisions recorded in City National. PCL in the prior year largely reflected provisions related to the International Wealth Management business.

PCL in Capital Markets increased $256 million, primarily due to higher provisions in the oil & gas sector.

PCL in Corporate Support and Other increased $52 million, reflecting a $50 million increase in PCL for loans not yet identified as impaired.

Gross impaired loans (GIL)		Table 56
(Millions of Canadian dollars, except percentage amounts)	**2016**	2015
Personal & Commercial Banking	**$ 1,651**	$ 1,809
Wealth Management (1)	**710**	178
Capital Markets	**1,524**	296
Investor & Treasury Services	**2**	2
Corporate Support and Other	**16**	–
Total GIL	**$ 3,903**	$ 2,285
Canada (2)		
Retail	**$ 642**	$ 624
Wholesale	**522**	512
GIL	**1,164**	1,136
U.S. (1), (2)		
Retail	**$ 56**	$ 10
Wholesale	**1,736**	204
GIL	**1,792**	214
Other International (2)		
Retail	**$ 380**	$ 356
Wholesale	**567**	579
GIL	**947**	935
Total GIL	**$ 3,903**	$ 2,285
Impaired loans, beginning balance	**$ 2,285**	$ 1,977
Classified as impaired during the period (new impaired) (3)	**3,673**	1,709
Net repayments (3)	**(946)**	(158)
Amounts written off	**(1,523)**	(1,338)
Other (3), (4)	**414**	95
Impaired loans, balance at end of period	**$ 3,903**	$ 2,285
GIL ratio (5)		
Total GIL ratio	**0.73%**	0.47%
Personal & Commercial Banking	**0.43%**	0.49%
Canadian Banking	**0.27%**	0.30%
Caribbean Banking	**7.56%**	9.13%
Wealth Management	**1.44%**	1.01%
GIL ratio – loans	**0.59%**	1.01%
GIL ratio – acquired credit-impaired loans	**0.85%**	n.a.
Capital Markets	**1.73%**	0.37%

(1) Includes $418 million (2015 – $nil) related to acquired credit impaired loans, with over 80% covered by loss-sharing agreements with the Federal Deposit Insurance Corporation (FDIC). For further details refer to Notes 2 and 5 of our 2016 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 loans and acceptances.
n.a. not applicable

2016 vs. 2015

Total GIL increased $1,618 million or 71%, and the GIL ratio of 73 bps increased 26 bps, from a year ago.

GIL in Personal & Commercial Banking decreased $158 million or 9%, and the GIL ratio of 43 bps decreased 6 bps, mainly due to lower impaired loans in our commercial lending portfolios.

GIL in Wealth Management increased $532 million, mainly due to the inclusion of our acquisition of City National, largely reflecting acquired credit impaired loans (ACI) of $418 million. Over 80% of these loans are covered by loss-sharing agreements with the Federal Deposit Insurance Corporation (FDIC). For further details on ACI loans, refer to Notes 2 and 5 of our 2016 Annual Consolidated Financial Statements.

GIL in Capital Markets increased $1,228 million, primarily due to higher impaired loans in the oil & gas sector reflecting the lower oil price environment.

Allowance for credit losses (ACL)		Table 57
(Millions of Canadian dollars)	**2016**	2015
Allowance for impaired loans		
Personal & Commercial Banking	**$ 520**	$ 548
Wealth Management (1)	**73**	43
Capital Markets	**216**	61
Investor & Treasury Services	**–**	2
Total allowance for impaired loans	**$ 809**	$ 654
Canada (2)		
Retail	**$ 160**	$ 142
Wholesale	**119**	111
Allowance for impaired loans	**279**	253
U.S. (1), (2)		
Retail	**$ 2**	$ 1
Wholesale	**177**	47
Allowance for impaired loans	**179**	48
Other International (2)		
Retail	**$ 180**	$ 169
Wholesale	**171**	184
Allowance for impaired loans	**351**	353
Total allowance for impaired loans	**$ 809**	$ 654
Allowance for loans not yet identified as impaired	**1,517**	1,466
Total ACL	**$2,326**	$ 2,120

(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.

2016 vs. 2015
Total ACL increased $206 million or 10% from a year ago, mainly related to higher ACL in Capital Markets, reflecting the low oil price environment, and higher ACL in Wealth Management, largely due to the inclusion of our acquisition of City National. This was partially offset by lower ACL in Personal & Commercial Banking. In addition, we recorded a $50 million increase in the allowance for loans not yet identified as impaired recorded in the second quarter of 2016.

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 at 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, including 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 that 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. Stressed VaR 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 2016 and 2015.

Market Risk VaR* **Table 58**

	2016				2015			
		For the year ended October 31				For the year ended October 31		
(Millions of Canadian dollars)	As at Oct. 31	Average	High	Low	As at Oct. 31	Average	High	Low
Equity	$ 13	$ 16	$ 32	$ 7	$ 20	$ 12	$ 31	$ 6
Foreign exchange	5	5	8	3	4	4	8	3
Commodities	5	3	5	2	3	3	6	2
Interest rate	18	21	32	14	26	28	34	23
Credit specific (1)	4	5	7	4	6	8	9	6
Diversification (2)	(21)	(17)	(23)	(11)	(18)	(22)	(34)	(15)
Market risk VaR	$ 24	$ 33	$ 53	$ 20	$ 41	$ 33	$ 45	$ 26
Market risk SVaR	$ 46	$ 82	$ 150	$ 41	$ 109	$ 104	$ 157	$ 73

* This table represents an integral part of our 2016 Annual Consolidated Financial Statements.

(1) General credit spread risk is measured under interest rate VaR while credit specific risk captures issuer-specific credit spread volatility.

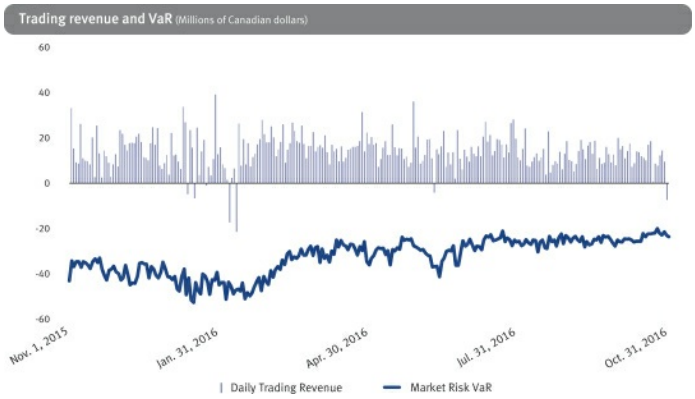
(2) Market risk VaR is less than the sum of the individual risk factor VaR results due to portfolio diversification.

2016 vs. 2015

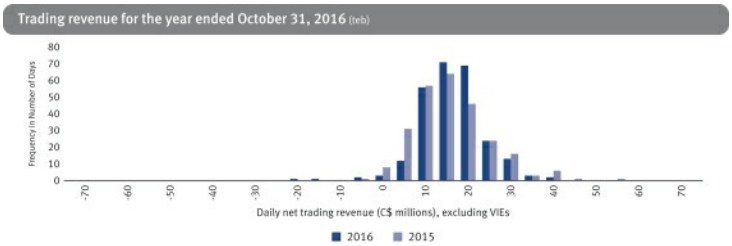
Average market risk VaR of $33 million remained unchanged from the prior year. Reduced inventories in fixed income and securitized product portfolios, as reflected in lower average interest rate and credit specific VaR in the year, and the impact from foreign exchange translation were offset by an increase in equity risk mainly attributable to client-driven activity and increased volatility in the historical window used to calculate VaR.

Average SVaR of $82 million was down $22 million compared to last year largely due to the reduced inventories in fixed income and securitized product portfolios as noted above and reduced risk in certain legacy businesses. During Q4 2016, SVaR reached the lowest level observed during the two-year period encompassing fiscal 2015 and 2016.

The following chart graphically displays a bar chart of our daily trading profit and loss and a line chart of our daily market risk VaR. We incurred net trading losses on 7 days in the year totalling $63 million, as compared to 9 days of losses totalling $25 million in 2015, with none of the losses exceeding VaR.



The following chart displays the distribution of daily trading profit and loss in 2016. The largest daily reported loss of $22 million on February 11, 2016 was primarily driven by volatility in equities and credit spreads resulting from global growth concerns. Of the 7 loss days in fiscal 2016, 1 occurred in the fourth quarter. This loss day was largely driven by market conditions that negatively impacted trading activity across major business lines. The largest reported profit was $39 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 fair value through profit or loss (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, 2016, we had liabilities with respect to insurance obligations of $9.2 billion, up from $9.1 billion in the prior year, and trading securities of $7.2 billion in support of the liabilities, unchanged from 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 oversight of SIRR 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 60.

Structural Interest Rate Risk measurement

To monitor and control SIRR, the Bank assesses two primary financial 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 calibrated from past experience and projected consistent with 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 market rate changes, across interest rate curves and interest rate volatilities.

The management of NII and EVE risks is complementary and supports efforts by the Bank to generate a sustainable high-quality NII stream. NII and EVE risks are measured daily, weekly or monthly depending on the size, complexity and hedge strategy applicable to a balance sheet or business activity.

A number of assumptions affecting cash flows, product re-pricing and the administration of rates underlie the models used to measure NII and EVE risks. The key assumptions pertain to the expected funding profiles for retail mortgage rate commitments, prepayment behaviour for fixed-rate loans, term deposit redemption behaviour, and the treatment of non-maturity deposits. All assumptions are derived empirically from historical client and product experience and consider future product pricing and customer needs. 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 the Bank's non-trading balance sheet, assuming no subsequent hedging. Rate floors are applied within the declining rates scenarios, with floor levels set based on global rate movement experience. Interest rate risk measures are based upon interest rate exposures at a specific time and continuously change as a result of business activities and risk management actions.

Market risk – SIRR measures* **Table 59**

	2016						2015		2014	
	Economic value of equity risk			Net interest income risk (1)						
(Millions of Canadian dollars)	Canadian dollar impact	U.S. dollar impact (2)	Total	Canadian dollar impact	U.S. dollar impact (2)	Total	Economic value of equity risk	Net interest income risk (2)	Economic value of equity risk	Net interest income risk (2)
Before-tax impact of:										
100bps increase in rates	**$ (1,321)**	**$ (56)**	**$(1,377)**	**$ 235**	**$ 185**	**$ 420**	$ (1,072)	$ 289	$ (916)	$ 414
100bps decrease in rates	**1,083**	**(439)**	**644**	**(300)**	**(165)**	**(465)**	829	(370)	754	(348)
Before-tax impact of:										
200bps increase in rates	**(2,682)**	**(201)**	**(2,883)**	**344**	**367**	**711**	(2,221)	472	(1,910)	763
200bps decrease in rates	**1,105**	**(441)**	**664**	**(290)**	**(177)**	**(467)**	925	(379)	1,259	(434)

* This table represents an integral part of our audited 2016 Annual Consolidated Financial Statements.
(1) Represents the 12-month Net interest income exposure to an instantaneous and sustained shift in interest rates.
(2) Represents the impact on the SIRR portfolios held in our U.S. banking operations.

At the end of fiscal 2016, an immediate and sustained -100 bps shock would have had a negative impact to the Bank's NII of $465 million, up from $370 million at the end of 2015. An immediate and sustained +100 bps shock at the end of fiscal 2016 would have had a negative impact to the Bank's EVE of $1,377 million, up from $1,072 million in 2015. The year-over-year increases in NII and EVE risks are primarily attributed to our acquisition of City National and growth in our balance sheet, in particular the fixed-rate asset position. During fiscal 2016, NII and EVE risks were maintained well within approved limits.

Market risk measures for other material non-trading portfolios

AFS securities

We held $70 billion of securities classified as AFS as at October 31, 2016, compared to $48 billion as at October 31, 2015. Growth in AFS securities was primarily driven by the consolidation of the City National AFS portfolio. We hold debt securities designated as AFS primarily as investments and to manage liquidity and interest rate risk in our non-trading banking activity. Certain legacy debt portfolios are also classified as AFS. As at October 31, 2016, our portfolio of AFS securities exposes us to interest rate risk of a pre-tax loss of $8.9 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 loss of $22.8 million, as measured by the change in value for a one basis point widening of credit spreads. Changes in the value of these securities are reported in other comprehensive income. The value of the AFS securities included in our SIRR measure as at October 31, 2016 was $48.6 billion. Our AFS securities also include equity exposures of $1.6 billion as at October 31, 2016, down from $1.8 billion as at October 31, 2015.

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

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 $5.1 billion as at October 31, 2016 were down from $6.4 billion as at October 31, 2015, and derivative liabilities of $4.1 billion as at October 31, 2016 were down from $4.5 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 $2.4 billion as at October 31, 2016, down from $2.8 billion as at October 31, 2015, and derivative liabilities of $1.8 billion as at October 31, 2016, down from $2.0 billion last year. These derivative assets and liabilities are included in our Structural Interest Rate Risk measure and other internal non-trading market risk measures. We use interest rate swaps to manage our AFS securities and structural interest rate risk, as described above. To the extent these swaps are considered effective hedges, changes in their fair value are recognized in other comprehensive income. The interest rate risk for the designated cash flow hedges, measured as the change in the fair value of the derivatives for a one basis point parallel increase in yields, was $5.2 million as of October 31, 2016 compared to $5.5 million as of October 31, 2015.

Interest rate swaps are also used to hedge changes in the fair value of certain fixed-rate instruments. Changes in fair value of the interest rate swaps and the hedged instruments that are related to interest rate movements are reflected in 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. These derivatives have been designated as FVTPL, with changes in the fair value of these derivatives reflected in income. Derivative assets of $2.7 billion as at October 31, 2016 on these trades were down from $3.6 billion as at October 31, 2015, and derivative liabilities of $2.3 billion as at October 31, 2016 were down from $2.5 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 level of 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 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 2015.

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 60

	As at October 31, 2016			
		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)	$ 14,929	$ 5,906	$ 9,023	Interest rate
Interest-bearing deposits with banks (4)	27,851	16,058	11,793	Interest rate
Securities				
Trading (5)	151,292	144,001	7,291	Interest rate, credit spread
Available-for-sale (6)	84,801	–	84,801	Interest rate, credit spread, equity
Assets purchased under reverse repurchase agreements and securities borrowed (7)	186,302	186,033	269	Interest rate
Loans				
Retail (8)	369,470	9,081	360,389	Interest rate
Wholesale (9)	154,369	2,341	152,028	Interest rate
Allowance for loan losses	(2,235)	–	(2,235)	Interest rate
Segregated fund net assets (10)	981	–	981	Interest rate
Derivatives	118,944	113,862	5,082	Interest rate, foreign exchange
Other assets (11)	68,353	24,727	43,626	Interest rate
Assets not subject to market risk (12)	5,201			
Total assets	$ 1,180,258	$ 502,009	$ 673,048	
Liabilities subject to market risk				
Deposits (13)	$ 757,589	$ 118,815	$ 638,774	Interest rate
Segregated fund liabilities (14)	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	103,441	103,441	–	Interest rate
Derivatives	116,550	112,500	4,050	Interest rate, foreign exchange
Other liabilities (15)	61,987	19,984	42,003	Interest rate
Subordinated debentures	9,762	–	9,762	Interest rate
Liabilities not subject to market risk (16)	7,967			
Total liabilities	$ 1,108,646	$ 405,109	$ 695,570	
Total equity	$ 71,612			
Total liabilities and equity	$ 1,180,258			

(1) Traded risk includes FVTPL positions whose revaluation gains and losses are reported in revenue. Market risk measures of VaR, 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 our Insurance business 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 $8,954 million included in SIRR. An additional $69 million is included in other risk controls.
(4) Interest-bearing deposits with banks of $11,793 million are included in SIRR.
(5) Trading securities include $7,291 million in securities used in the management of the SIRR of RBC Insurance, which is not included in our disclosed SIRR measure.
(6) Includes available-for-sale securities of $69,922 million and held-to-maturity securities of $14,879 million. $63,475 million of the total securities are included in SIRR. An additional $1,901 million are held by our insurance businesses that do not contribute to our disclosed SIRR measures. The remaining $19,425 million are captured in other internal non-trading market risk reporting.
(7) Assets purchased under reverse repurchase agreements include $269 million reflected in SIRR.
(8) Retail loans include $360,138 million reflected in SIRR. An additional $251 million is used in the management of the SIRR of RBC Insurance.
(9) Wholesale loans include $150,619 million reflected in SIRR. An additional $1,409 million is used in the management of the SIRR of RBC Insurance.
(10) Investments for the account of segregated fund holders are included in the management of the SIRR of RBC Insurance.
(11) Other assets include $41,168 million reflected in SIRR. An additional $2,458 million is used in the management of the SIRR of RBC Insurance.
(12) Assets not subject to market risk include $5,201 million of physical and other assets.
(13) Deposits include $638,774 million reflected in SIRR.
(14) Insurance and investment contracts for the account of segregated fund holders are included in the management of the SIRR of RBC Insurance.
(15) Other liabilities include $9,900 million used in the management of the SIRR of RBC Insurance and $32,103 million contribute to our SIRR measure.
(16) Liabilities not subject to market risk include $7,967 million of payroll related and other liabilities.

(Millions of Canadian dollars)	Balance sheet amount	Market risk measure: Traded risk (1)	Market risk measure: Non-traded risk (2)	Non-traded risk primary risk sensitivity
	As at October 31, 2015			
Assets subject to market risk				
Cash and due from banks (3)	$ 12,452	$ 5,720	$ 6,732	Interest rate
Interest-bearing deposits with banks (4)	22,690	15,764	6,926	Interest rate
Securities				
Trading (5)	158,703	151,420	7,283	Interest rate, credit spread
Available-for-sale (6)	56,805	–	56,805	Interest rate, credit spread, equity
Assets purchased under reverse repurchase agreements and securities borrowed (7)	174,723	174,594	129	Interest rate
Loans				
Retail (8)	348,183	16,337	331,846	Interest rate
Wholesale (9)	126,069	140	125,929	Interest rate
Allowance for loan losses	(2,029)	–	(2,029)	Interest rate
Segregated fund net assets (10)	830	–	830	Interest rate
Derivatives	105,626	99,233	6,393	Interest rate, foreign exchange
Other assets (11)	64,082	24,578	39,504	Interest rate
Assets not subject to market risk (12)	6,074			
Total assets	$ 1,074,208	$ 487,786	$ 580,348	
Liabilities subject to market risk				
Deposits (13)	$ 697,227	$ 151,776	$ 545,451	Interest rate
Segregated fund liabilities (14)	830	–	830	Interest rate
Other				
Obligations related to securities sold short	47,658	47,658	–	
Obligations related to assets sold under repurchase agreements and securities loaned (15)	83,288	83,165	123	Interest rate
Derivatives	107,860	103,348	4,512	Interest rate, foreign exchange
Other liabilities (16)	58,184	19,757	38,427	Interest rate
Subordinated debentures	7,362	–	7,362	Interest rate
Liabilities not subject to market risk (17)	7,855			
Total liabilities	$ 1,010,264	$ 405,704	$ 596,705	
Total equity	$ 63,944			
Total liabilities and equity	$ 1,074,208			

(1) Traded risk includes FVTPL positions whose revaluation gains and losses are reported in revenue. Market risk measures of VaR, 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 our Insurance business 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 $5,829 million included in SIRR. An additional $903 million is included in other risk controls.
(4) Interest-bearing deposits with banks of $6,926 million are included in SIRR.
(5) Trading securities include $7,283 million in securities used in the management of the SIRR of RBC Insurance, which is not included in our disclosed SIRR measure.
(6) Includes available-for-sale securities of $48,164 million and held-to-maturity securities of $8,641 million. $43,528 million of the total securities are included in SIRR. An additional $1,917 million are held by our insurance businesses that do not contribute to our disclosed SIRR measures. The remaining $11,360 million are captured in other internal non-trading market risk reporting.
(7) Assets purchased under reverse repurchase agreements include $129 million reflected in SIRR.
(8) Retail loans include $331,846 million reflected in SIRR.
(9) Wholesale loans include $124,701 million reflected in SIRR. An additional $1,228 million is used in the management of the SIRR of RBC Insurance.
(10) Investments for the account of segregated fund holders are included in the management of the SIRR of RBC Insurance.
(11) Other assets include $36,728 million reflected in SIRR. An additional $2,776 million is used in the management of the SIRR of RBC Insurance.
(12) Assets not subject to market risk include $6,074 million of physical and other assets.
(13) Deposits include $545,451 million reflected in SIRR.
(14) Insurance and investment contracts for the account of segregated fund holders are included in the management of the SIRR of RBC Insurance.
(15) Obligations related to assets sold under repurchase agreements include $123 million reflected in SIRR.
(16) Other liabilities include $10,019 million used in the management of the SIRR of RBC Insurance, and $28,408 million contribute to our SIRR measure.
(17) Liabilities not subject to market risk include $7,855 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 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;
- 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 Group Risk Committee (GRC) and the Asset/Liability Committee (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.

- PRC annually approves the Liquidity Risk Policy (LRP), which establishes minimum risk control elements in accordance with the Board-approved risk appetite and 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 group-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 Liquidity Contingency Plan, 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

As recommended by the Enhanced Disclosure Task Force (EDTF), 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.

Liquidity reserve **Table 61**

	As at October 31, 2016				
(Millions of Canadian dollars)	**Bank-owned liquid assets** (1)	**Securities received as collateral from securities financing and derivative transactions**	**Total liquid assets**	**Encumbered liquid assets**	**Unencumbered liquid assets**
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 multicultural development banks (2)	**295,603**	**28,564**	**324,167**	**168,395**	**155,772**
Other	**146,269**	**34,386**	**180,655**	**72,765**	**107,890**
Liquidity assets eligible at central banks (not included above) (3)	**600**	**–**	**600**	**–**	**600**
Undrawn credit lines granted by central banks (4)	**13,558**	**–**	**13,558**	**–**	**13,558**
Other assets eligible as collateral for discount (5)	**141,888**	**–**	**141,888**	**–**	**141,888**
Other liquid assets (6)	**23,307**	**–**	**23,307**	**23,307**	**–**
Total liquid assets	**$ 654,675**	**$ 62,950**	**$ 717,625**	**$ 266,510**	**$ 451,115**

	As at October 31, 2015				
(Millions of Canadian dollars)	Bank-owned liquid assets (1)	Securities received as collateral from securities financing and derivative transactions	Total liquid assets	Encumbered liquid assets	Unencumbered liquid assets
Cash and holding at central banks	$ 25,075	$ –	$ 25,075	$ 1,719	$ 23,356
Deposits in other banks available overnight	2,298	–	2,298	1	2,297
Securities issued or guaranteed by sovereigns, central banks or multilateral development banks (2)	257,338	21,216	278,554	127,702	150,852
Other	142,713	31,751	174,464	80,349	94,115
Liquidity assets eligible at central banks (not included above) (3)	63	–	63	–	63
Undrawn credit lines granted by central banks (4)	11,844	–	11,844	–	11,844
Other assets eligible as collateral for discount (5)	128,401	–	128,401	–	128,401
Other liquid assets (6)	21,675	–	21,675	21,675	–
Total liquid assets	$ 589,407	$ 52,967	$ 642,374	$ 231,446	$ 410,928

	As at	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
Royal Bank of Canada	**$ 264,522**	$ 252,052
Foreign branches	**53,006**	64,684
Subsidiaries	**133,587**	94,192
Total unencumbered liquid assets	**$ 451,115**	$ 410,928

(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) Includes Auction Rate Securities.

(4) 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.

(5) 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.

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

2016 vs. 2015
Total liquid assets increased $75.3 billion or 12%, primarily due to our acquisition of City National as well as an increase in collateral received under reverse repurchase and securities financing transactions.

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, 2016, our Unencumbered assets available as collateral comprised 38% of our total assets (October 31, 2015 – 38%).

Asset encumbrance **Table 62**

	As at									
	October 31 2016					October 31 2015				
	Encumbered		**Unencumbered**			Encumbered		Unencumbered		
(Millions of Canadian dollars)	**Pledged as collateral**	**Other** (1)	**Available as collateral** (2)	**Other** (3)	**Total** (4)	Pledged as collateral	Other (1)	Available as collateral (2)	Other (3)	Total (4)
Cash and due from banks	**$ –**	**$ 1,781**	**$ 13,148**	**$ –**	**$ 14,929**	$ –	$ 1,719	$ 10,733	$ –	$ 12,452
Interest-bearing deposits with banks	**–**	**262**	**27,589**	**–**	**27,851**	1	–	22,689	–	22,690
Securities										
Trading	**66,734**	**–**	**83,219**	**1,339**	**151,292**	66,752	–	90,551	1,400	158,703
Available-for-sale	**2,858**	**–**	**78,966**	**2,977**	**84,801**	7,800	669	45,548	2,788	56,805
Assets purchased under reverse repurchase agreements and securities borrowed	**179,534**	**–**	**89,200**	**15,204**	**283,938**	148,117	–	89,929	18,398	256,444
Loans										
Retail										
Mortgage securities	**34,624**	**–**	**35,591**	**–**	**70,215**	35,889	–	33,921	–	69,810
Mortgage loans	**40,293**	**–**	**12,796**	**131,694**	**184,783**	36,422	–	–	127,743	164,165
Non-mortgage loans	**10,422**	**–**	**100,612**	**3,438**	**114,472**	8,314	–	100,040	5,854	114,208
Wholesale	**3,477**	**–**	**41,445**	**109,447**	**154,369**	3,376	–	40,867	81,826	126,069
Allowance for loan losses	**–**	**–**	**–**	**(2,235)**	**(2,235)**	–	–	–	(2,029)	(2,029)
Segregated fund net assets	**–**	**–**	**–**	**981**	**981**	–	–	–	830	830
Other – Derivatives	**–**	**–**	**–**	**118,944**	**118,944**	–	–	–	105,626	105,626
– Others (5)	**23,307**	**–**	**–**	**50,247**	**73,554**	22,286	–	–	47,870	70,156
Total assets	**$ 361,249**	**$ 2,043**	**$ 482,566**	**$ 432,036**	**$ 1,277,894**	$ 328,957	$ 2,388	$ 434,278	$ 390,306	$ 1,155,929

(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 and derivative transactions.
(5) 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, 2016, relationship-based deposits, which are the primary source of funding for retail loans and mortgages, were $506 billion or 55% of our total funding (October 31, 2015 – $422 billion or 51%). 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 2016, 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, $25.4 billion of term funding in various currencies and markets. Total unsecured long-term funding outstanding decreased by $3.3 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 2015, our outstanding MBS sold decreased $2.2 billion. Our covered bonds and securitized credit card receivables increased $3.2 billion and $744 million.

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

Long-term funding sources*

Table 63

	As at	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
Unsecured long-term funding	**$ 98,827**	$ 102,081
Secured long-term funding	**69,971**	68,228
Commercial mortgage-backed securities sold	**1,297**	1,080
Subordinated debentures	**9,597**	7,227
	$ 179,692	$ 178,616

* This table represents an integral part of our 2016 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.

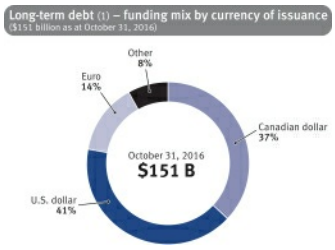
Programs by geography

Table 64

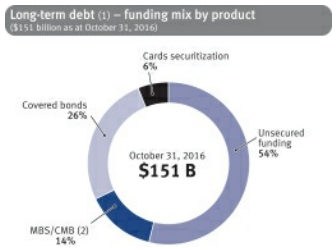
Canada	**U.S.**	**Europe/Asia**
• Canadian Shelf – $25 billion	• SEC Registered Medium Term Note Program – US$40 billion • SEC Registered Covered Bond Program – US$15 billion (1)	• European Debt Issuance Program – US$40 billion • Global Covered Bond Program – €32 billion • Japanese Issuance Programs – ¥1 trillion

(1) Subject to the €32 billion Global Covered Bond Program limit.

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.



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



(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 and represents our enhanced disclosure in response to EDTF recommendations:

Composition of wholesale funding (1) **Table 65**

	As at October 31, 2016							
(Millions of Canadian dollars)	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

	As at October 31, 2015							
(Millions of Canadian dollars)	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)	$ 5,107	$ 62	$ 13	$ 30	$ 5,212	$ –	$ –	$ 5,212
Certificates of deposit and commercial paper	9,355	9,648	18,591	10,071	47,665	451	207	48,323
Asset-backed commercial paper (3)	883	2,317	6,989	1,572	11,761	–	–	11,761
Senior unsecured medium-term notes (4)	944	6,403	4,165	11,348	22,860	17,670	42,520	83,050
Senior unsecured structured notes (5)	151	535	376	577	1,639	679	6,070	8,388
Mortgage securitization	41	1,088	673	2,139	3,941	2,656	16,049	22,646
Covered bonds/asset-backed securities (6)	–	1,961	654	5,438	8,053	7,518	30,041	45,612
Subordinated liabilities	1,500	–	–	–	1,500	108	5,619	7,227
Other (7)	4,126	3,283	252	1,318	8,979	12	4,408	13,399
Total	$ 22,107	$ 25,297	$ 31,713	$ 32,493	$ 111,610	$ 29,094	$ 104,914	$ 245,618
Of which:								
– Secured	$ 4,952	$ 7,506	$ 8,315	$ 9,149	$ 29,922	$ 10,174	$ 46,090	$ 86,186
– Unsecured	17,155	17,791	23,398	23,344	81,688	18,920	58,824	159,432

(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 $2,567 million (October 31, 2015 – $6,088 million), bearer deposit notes (unsecured) of $1,652 million (October 31, 2015 – $3,186 million) and other long-term structured deposits (unsecured) of $4,874 million (October 31, 2015 – $4,125 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 and liquidity and other factors not completely within our control.

On June 6, 2016, S&P revised our outlook to negative from stable and affirmed our ratings.
On July 19, 2016, Moody's affirmed our ratings with a negative outlook.
On July 28, 2016, DBRS affirmed our ratings with a negative outlook.
On October 28, 2016, Fitch Ratings affirmed our ratings with a negative outlook.

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

Credit ratings — **Table 66**

	As at November 29, 2016		
	Short-term debt	**Senior long-term debt**	**Outlook**
Moody's	**P-1**	**Aa3**	**negative**
Standard & Poor's	**A-1+**	**AA-**	**negative**
Fitch Ratings	**F1+**	**AA**	**negative**
Dominion Bond Rating Services	**R-1(high)**	**AA**	**negative**

(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.

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 prepayment of principal.

Additional contractual obligations for rating downgrades — **Table 67**

	As at					
	October 31 2016			October 31 2015		
(Millions of Canadian dollars)	**One-notch downgrade**	**Two-notch downgrade**	**Three-notch downgrade**	One-notch downgrade	Two-notch downgrade	Three-notch downgrade
Contractual derivatives funding or margin requirements	**$ 487**	**$ 117**	**$ 501**	$ 760	$ 132	$ 972
Other contractual funding or margin requirements (1)	**293**	**473**	**–**	421	88	–

(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 HQLA available to meet liquidity needs over a 30-day period in an acute stress scenario. The 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 month-end positions during the quarter.

Liquidity coverage ratio (1) **Table 68**

(Millions of Canadian dollars, except percentage amounts)	For the three-months ended October 31 2016		October 31 2015	
	Total unweighted value (average) (2)	**Total weighted value (average)**	Total unweighted value (average) (2)	Total weighted value (average)
High-quality liquid assets				
Total high-quality liquid assets (HQLA)	[redacted]	**207,541**	[redacted]	194,785
Cash outflows				
Retail deposits and deposits from small business customers, of which:	**224,518**	**17,372**	180,831	13,856
Stable deposits (3)	**72,570**	**2,177**	60,399	1,813
Less stable deposits	**151,948**	**15,195**	120,432	12,043
Unsecured wholesale funding, of which:	**234,455**	**99,877**	217,592	97,305
Operational deposits (all counterparties) and deposits (4) *in networks of cooperative banks*	**106,040**	**25,491**	97,255	23,342
Non-operational deposits	**113,719**	**59,690**	101,632	55,258
Unsecured debt	**14,696**	**14,696**	18,705	18,705
Secured wholesale funding	[redacted]	**26,069**	[redacted]	26,709
Additional requirements, of which:	**226,706**	**67,106**	195,694	51,288
Outflows related to derivative exposures and other collateral requirements	**59,910**	**34,299**	43,709	17,747
Outflows related to loss of funding on debt products	**5,364**	**5,364**	4,893	4,893
Credit and liquidity facilities	**161,432**	**27,443**	147,092	28,648
Other contractual funding obligations (5)	**30,951**	**30,951**	28,056	28,056
Other contingent funding obligations (6)	**448,854**	**6,814**	433,181	6,224
Total cash outflows	[redacted]	**248,189**	[redacted]	223,438
Cash inflows				
Secured lending (e.g., reverse repos)	**126,615**	**31,978**	119,274	32,982
Inflows from fully performing exposures	**10,559**	**7,042**	11,709	8,013
Other cash inflows	**45,207**	**45,207**	29,309	29,309
Total cash inflows	[redacted]	**84,227**	[redacted]	70,304
		Total adjusted value		Total adjusted value
Total HQLA	[redacted]	**207,541**	[redacted]	194,785
Total net cash outflows	[redacted]	**163,962**	[redacted]	153,134
Liquidity coverage ratio	[redacted]	**127%**	[redacted]	127%

(1) LCR is calculated in accordance with OSFI's LAR guideline, which, in turn, reflects liquidity-related requirements issued by the BCBS.
(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 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 management's 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 80% 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 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 management believes would be available to the Bank in a stress situation. All maturing wholesale debt is assigned 100% outflow in the LCR calculation.

Q4 2016 vs. Q4 2015
The average LCR for the quarter ended October 31, 2016 of 127% was consistent with the prior year, reflecting active liquidity management in response to balance sheet growth and funding maturities.

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 69

	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	88,702	6,113	1,568	–	756	8	21	–	6,273	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	$ 209,692	$ 63,753	$ 48,312	$ 26,451	$ 33,174	$ 64,400	$ 127,208	$ 86,997	$ 421,885	$ 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	$ 210,555	$ 67,445	$ 48,588	$ 26,606	$ 33,328	$ 65,599	$ 129,674	$ 96,405	$ 502,058	$ 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, as explained in the preceding Deposit profile section, for our operations and liquidity needs.

(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
	As at October 31, 2015									
Assets										
Cash and deposits with banks	$ 31,355	$ 56	$ 17	$ 530	$ –	$ –	$ –	$ –	$ 3,184	$ 35,142
Securities										
Trading (1)	103,718	21	26	77	51	188	552	5,580	48,490	158,703
Available-for-sale	2,947	3,682	1,345	3,259	988	4,778	20,154	17,802	1,850	56,805
Assets purchased under reverse repurchase agreements and securities borrowed	82,017	30,851	27,871	16,570	7,320	2,601	–	–	7,493	174,723
Loans (net of allowance for loan losses)	15,020	11,828	23,196	22,295	18,234	89,179	184,249	22,833	85,389	472,223
Other										
Customers' liability under acceptances	10,343	3,032	71	–	–	6	1	–	–	13,453
Derivatives	7,492	8,129	3,747	3,074	2,479	10,639	25,244	44,811	11	105,626
Other financial assets	29,187	624	711	169	33	83	26	525	966	32,324
Total financial assets	$ 282,079	$ 58,223	$ 56,984	$ 45,974	$ 29,105	$ 107,474	$ 230,226	$ 91,551	$ 147,383	$ 1,048,999
Other non-financial assets	1,792	1,506	526	374	60	866	1,573	2,425	16,087	25,209
Total assets	$ 283,871	$ 59,729	$ 57,510	$ 46,348	$ 29,165	$ 108,340	$ 231,799	$ 93,976	$ 163,470	$ 1,074,208
Liabilities and equity										
Deposits (2)										
Unsecured borrowing	$ 40,992	$ 29,994	$ 41,298	$ 20,175	$ 27,220	$ 30,697	$ 53,403	$ 14,479	$ 338,378	$ 596,636
Secured borrowing	970	4,818	8,602	7,567	2,676	9,708	19,318	9,736	–	63,395
Covered bonds	–	1,961	–	2,293	1,165	3,269	24,064	4,444	–	37,196
Other										
Acceptances	10,343	3,032	71	–	–	6	1	–	–	13,453
Obligations related to securities sold short	47,658	–	–	–	–	–	–	–	–	47,658
Obligations related to assets sold under repurchase agreements and securities loaned	66,099	7,580	1,419	422	800	780	10	–	6,178	83,288
Derivatives	5,376	8,481	4,146	4,205	3,884	12,240	28,140	41,383	5	107,860
Other financial liabilities	23,210	1,236	391	120	198	72	239	4,188	349	30,003
Subordinated debentures	–	–	–	–	–	–	–	7,362	–	7,362
Total financial liabilities	$ 194,648	$ 57,102	$ 55,927	$ 34,782	$ 35,943	$ 56,772	$ 125,175	$ 81,592	$ 344,910	$ 986,851
Other non-financial liabilities	990	3,291	170	142	169	894	2,564	8,522	6,671	23,413
Equity	–	–	–	–	–	–	–	–	63,944	63,944
Total liabilities and equity	$ 195,638	$ 60,393	$ 56,097	$ 34,924	$ 36,112	$ 57,666	$ 127,739	$ 90,114	$ 415,525	$ 1,074,208
Off-balance sheet items										
Financial guarantees	$ 828	$ 2,798	$ 1,348	$ 2,115	$ 1,552	$ 2,861	$ 5,813	$ 147	$ 32	$ 17,494
Lease commitments	62	123	180	175	177	602	1,293	1,808	–	4,420
Commitments to extend credit	3,801	6,005	9,854	10,976	8,281	32,971	127,747	14,127	3,113	216,875
Other credit-related commitments	623	828	1,172	1,169	1,014	343	834	272	74,247	80,502
Other commitments	353	–	–	–	–	–	–	–	–	353
Total off-balance sheet items	$ 5,667	$ 9,754	$ 12,554	$ 14,435	$ 11,024	$ 36,777	$ 135,687	$ 16,354	$ 77,392	$ 319,644

(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, as explained in the preceding Deposit profile section, for our operations and liquidity needs.

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.

Contractual maturities of financial liabilities and off-balance sheet items – undiscounted basis * **Table 70**

	As at October 31, 2016					
(Millions of Canadian dollars)	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	6,618	6,224	–	1	–	12,843
Obligations related to securities sold short	–	49,911	–	–	–	49,911
Obligations related to assets sold under repurchase agreements and securities loaned	6,274	97,139	8	21	–	103,442
Other liabilities	445	24,198	112	289	4,761	29,805
Subordinated debentures	–	–	–	115	9,646	9,761
	371,591	399,324	50,413	100,721	39,829	961,878
Off-balance sheet items						
Financial guarantees (2)	7,616	11,258	11	–	1	18,886
Operating leases	–	727	661	1,528	2,131	5,047
Commitments to extend credit (2)	181,496	41,671	5	59	–	223,231
	189,112	53,656	677	1,587	2,132	247,164
Total financial liabilities and off-balance sheet items	$ 560,703	$ 452,980	$ 51,090	$ 102,308	$ 41,961	$ 1,209,042

	As at October 31, 2015					
(Millions of Canadian dollars)	On demand	Within 1 year	1 year to 2 years	2 years to 5 years	5 years and greater	Total
Financial liabilities						
Deposits (1)	$ 311,743	$ 216,876	$ 43,631	$ 96,104	$ 28,539	$ 696,893
Other						
Acceptances	–	13,446	6	1	–	13,453
Obligations related to securities sold short	–	47,658	–	–	–	47,658
Obligations related to assets sold under repurchase agreements and securities loaned	6,179	76,320	780	10	–	83,289
Other liabilities	334	25,174	72	237	4,139	29,956
Subordinated debentures	–	–	–	–	7,227	7,227
	318,256	379,474	44,489	96,352	39,905	878,476
Off-balance sheet items						
Financial guarantees (2)	7,079	10,399	11	4	1	17,494
Operating leases	–	717	602	1,293	1,808	4,420
Commitments to extend credit (2)	172,927	43,929	4	2	13	216,875
	180,006	55,045	617	1,299	1,822	238,789
Total financial liabilities and off-balance sheet items	$ 498,262	$ 434,519	$ 45,106	$ 97,651	$ 41,727	$ 1,117,265

* This table represents an integral part of our 2016 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, as explained in the preceding Deposit profile section, for our operations and liquidity needs.

(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.

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.

We have implemented an Insurance Risk Framework that provides an overview of our processes and tools for identifying, assessing, managing and reporting on the insurance risks that face the organization. Key insurance-specific processes and tools include: risk appetite, delegated authorities and risk limits, capital management, own risk and solvency assessment, comprehensive identification and assessment of risk process, stress testing, insurance product and project risk review and approval, insurance product pricing, reinsurance, insurance underwriting, insurance claims management, experience study analysis, actuarial liabilities, and embedded value.

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.

Three lines of defence

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 & 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.

Model risk

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.

Information technology and cybersecurity risk

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) that could potentially have an adverse impact on our business. Such events could result in business interruption, service disruptions, theft of intellectual property and confidential information, additional regulatory scrutiny, litigation and reputational damage. To manage our information technology risk, we have established an enterprise-wide Information Technology Risk Management Framework.

Information management risk

Information management risk is the risk of loss or harm resulting from the failure to manage information appropriately throughout its life-cycle. Exposure to this risk exists when information is acquired or created, processed, used, shared, accessed, retained or disposed. With respect to personal information, the failure to manage information appropriately can result in the misuse of personal information or privacy breaches. With respect to client information, the inability to process information accurately and on a timely basis can result in service disruptions. With respect to corporate and proprietary information, the mismanagement of information can result in the disclosure of confidential information, the unavailability of information when it is required and the reliance on inaccurate information for decision-making purposes. Such events could lead to legal and regulatory consequences, reputational damage and financial loss.

Third-party and outsourcing risk
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.

Social media
The scale and profile of social media has grown to present a number of risks. These risks include brand and reputational damage, information leaks, non-compliance with regulatory requirements and governance risk. To manage the risks associated with social media, we have implemented an enterprise-wide policy as well as business unit policies on the usage of external social media, which sets out the requirements for the business and corporate use of social media and is part of our larger Social Media Governance Framework.

Processing and execution risk
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, transposing figures, 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.

Fraud
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 as a result of fraudulent activity or operational errors, as well as the improvement of loss avoidance experience through both enhanced intelligence and aggressive pursuit of those who attack enterprise assets.

Operational risk capital
On May 10, 2016, OSFI approved our application to use the Advanced Measurement Approach (AMA) for operational risk, subject to a capital floor. In Q3 2016, we formally began utilizing AMA to report regulatory capital.

Operational risk loss events
During 2016, we did not experience any material operational risk loss event. For further details on our contingencies, including litigation, refer to Notes 26 and 27 of our 2016 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 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 consistent with regulatory expectations from OSFI and other regulators. The framework is 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 has been further defined as 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 support the minimum requirements for the prudent management of regulatory compliance risk. Within the framework there are six elements that form a cycle by which all regulatory compliance risk management programs are developed, implemented and maintained.

The cycle revolves around and is informed by the people, processes, and technology that exist within the organization.

- Global compliance practices and methodologies: compliance policies, processes and methodologies that drive the regulatory compliance management approach.
- Regulatory compliance requirements: laws, rules and regulations with which we must comply.

- Risk assessment: identification and assessment of regulatory compliance risk to ensure appropriate risk-based monitoring and testing programs are in place.
- Monitoring and testing: risk-based activities conducted to assess compliance with regulatory requirements.
- Issues identification and management: identification, timely escalation and management of compliance related issues.
- Communication and reporting: timely, accurate and complete reporting to key stakeholders, senior management and the Board of Directors.

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.

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.

We have put in place a Reputation Risk Framework which 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 extends to the Board of Directors.

Legal and regulatory environment risk

Certain regulatory reforms will impact the way in which we operate, both in Canada and abroad, and the full impact of some of these reforms 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 regulatory reforms have potential to increase our operational, compliance, and technology costs and adversely affect our profitability.

Canadian Housing Market and Consumer Debt

The Government of Canada (GoC) continues to express concerns with the level and sustainability of Canadian household debt, driven in part by higher levels of mortgage debt as a result of persistent and unprecedented low interest rates and continued elevation of house prices in the Vancouver and Toronto markets. The Office of the Superintendent of Financial Institutions (OSFI) has introduced a number of measures to address these concerns. These include updates to the regulatory capital requirements for loans secured by residential real estate, effective November 1, 2016, and proposals issued on September 23, 2016 to change the regulatory framework for mortgage insurers to better align capital requirements to market conditions and more accurately reflect underlying risks. In addition, on July 7, 2016, OSFI released a letter to all federally regulated financial institutions (FRFIs) outlining the regulator's expectation for the internal controls and risk management practices of mortgage lenders and insurers to be sound and take into account changing market developments.

The GoC has also been studying the Canadian housing market, particularly in areas such as affordability, supply and demand, and long-term sustainability, and, on October 3, 2016, announced additional measures. These include: (i) standardizing the eligibility criteria for high- and low-ratio insured mortgages (effective November 30, 2016); (ii) introducing a mortgage rate stress test for all insured mortgages (effective October 17, 2016); (iii) modifying eligibility for the capital gains tax exemption on the sale of a principal residence by non-residents and certain trusts; and (iv) expanding the authority of the Canada Revenue Agency to improve compliance and administration of the tax system with respect to the disposition of real estate. In addition, the GoC announced it will be holding further public consultations on whether lender-risk sharing for government-backed insured mortgages could enhance the current system.

Credit Cards and Interchange Fees

On September 14, 2016, the GoC announced its intention to further assess the fees charged by credit card networks in order to ensure adequate competition and transparency for Canadian businesses and consumers when it comes to the fees they incur when using credit cards. At the same time, the GoC indicated it will review the effects of the November 2014 voluntary fee reductions undertaken by Visa and MasterCard‡.

Supervision of Foreign Banking Organizations (FBO)

On February 18, 2014, the U.S. Federal Reserve (Fed) finalized a new oversight regime for non-U.S. banks with subsidiaries, affiliates and branches operating in the U.S. The Enhanced Prudential Standards applies to all Bank Holding Companies and FBOs and is intended to address the perceived systemic risk that large foreign banks could pose to U.S. financial markets.

As an FBO with more than US$50 billion in U.S. non-branch assets, we were required to establish a separately capitalized U.S. Intermediate Holding Company (IHC), into which all of our U.S. legal entities must be placed and for which certain U.S.-based requirements apply. The IHC is subject to Fed oversight comparable to U.S. bank holding companies. On November 2, 2015, our existing U.S. holding company, RBC USA Holdco Corporation, became a U.S. bank holding company, subjecting it to certain U.S.-based requirements as a result of our acquisition of City National Bank Corporation, a U.S. insured depository institution. As of July 1, 2016, our required non-branch and non-agency U.S. assets were transferred into our U.S. holding company in order to establish the requisite IHC as it applies to RBC as an FBO.

On March 4, 2016, the Fed re-proposed a rule to limit the credit exposures of large banking organizations, including FBOs and IHCs, to any single counterparty or group of related counterparties. We expect we will need to modify our existing systems and put in place appropriate monitoring and reporting mechanisms in order to comply with the prescribed limits by the implementation deadline that will be established once the final rule is issued. If the rule is adopted as proposed, compliance will be required to be met daily, with monthly reporting to the Fed evidencing compliance.

We continue to enhance our existing risk management oversight and governance framework and practices in order to provide the governance and infrastructure needed to implement and support the remaining FBO-related requirements over the next several years, including those that relate to U.S. stress test and capital planning requirements.

Canadian Bail-in Regime

Bail-in regimes are being implemented in a number of jurisdictions in an effort to limit taxpayer exposure to potential losses of a failing institution and ensure the institution's shareholders and creditors remain responsible for bearing such losses. On April 20, 2016, the GoC introduced legislation to create a bank recapitalization or "bail-in" regime for the six domestic systemically important banks (D-SIBs). On June 22, 2016, legislation came into force, amending the *Bank Act*, the *Canada Deposit Insurance Corporation Act* and certain other federal statutes pertaining to banks to create such a regime for D-SIBs.

Under the regime, if OSFI is of the opinion that a D-SIB has ceased or is about to cease to be viable and its viability cannot be restored through the exercise of the Superintendent's powers, the GoC can direct the Canada Deposit Insurance Corporation to convert certain shares and liabilities of the bank into common shares of the bank or its affiliates. The shares and liabilities that will be subject to conversion, as well as the terms and conditions of conversion, will be prescribed by regulations to be made at a future date. The legislation also provides that OSFI will require such designated D-SIBs to maintain a minimum capacity to absorb losses, also known as total loss-absorbing capital (TLAC).

While the specific parameters around conversion and loss-absorbency are not yet known, these changes are not expected to have a material impact on our cost of long-term unsecured funding.

Total Loss-Absorbing Capacity (TLAC)

On November 9, 2015, the Financial Stability Board (FSB) finalized minimum common international standards related to TLAC of global systemically important banks (G-SIBs). The standards are intended to address the sufficiency of G-SIBs' capital to absorb losses in a resolution situation in a manner that minimizes impact on financial stability and ensures continuity of critical and long-term debt functions. Under the final standards, G-SIBs would be expected to meet a 16% Risk-Weighted Asset (RWA) requirement by 2019, increasing to 18% by 2022. In addition, G-SIBs would be expected by 2019 to maintain a TLAC leverage ratio exposure of 6% of the Basel III leverage ratio denominator, increasing to 6.75% by 2022. We would become subject to these enhanced requirements if we are designated as a G-SIB by the FSB in the future. To date, neither RBC nor any other Canadian bank has been designated as a G-SIB. It is also uncertain how these standards will be integrated into the Canadian bail-in regime described above.

On October 30, 2015, the Fed proposed rules establishing TLAC, long-term debt, and "clean holding company" requirements for U.S. G-SIBs and the IHCs of non-U.S. G-SIBs. We are not covered at this time by the proposal, but our U.S. IHC would become subject to these U.S. requirements should we be designated as a G-SIB in the future.

Global Over-the-Counter (OTC) Derivatives Reform

OTC derivatives reform continues on a global basis, with G20 governments transforming the capital regimes, regulatory frameworks and infrastructures in which market participants operate. On September 1, 2016, we began to exchange margin on bilateral OTC derivatives in accordance with U.S. regulatory guidelines and expect to become subject to Canadian rules on March 1, 2017. We will also be subject to EU and other jurisdictions' margin rules once deadlines are finalized. Global margin rules represent a fundamental change in how non-centrally cleared OTC derivatives are traded and require specific documents to be in place with all in-scope counterparties.

To avoid duplicative regulatory requirements and to mitigate banks' regulatory costs, the Commodity Futures Trading Commission (CFTC) has issued substituted compliance relief to us and other Canadian banks who are registered as non-U.S. swap dealers. Such relief allows us to comply with Canadian rules in areas deemed comparable by the CFTC. We, along with other Canadian banks, continues to engage with the CFTC to ensure ongoing availability of no-action relief and substituted compliance determinations in connection with these U.S. rules.

OTC derivatives reform in the EU is implemented through the European Market Infrastructure Regulation (EMIR) and the review of Markets in Financial Instruments Directive and accompanying Regulation (together, MiFID II/MiFIR). EU regulations will introduce requirements that certain products be traded on a new trading venue category, subject to a determination of sufficient liquidity by the European Securities and Markets Authority (ESMA), for certain OTC derivatives that ESMA has deemed to be subject to the clearing obligation under EMIR. The EU also announced it would delay implementation of MiFID II/MiFIR until January 2018.

Uniform Fiduciary Standards

On April 6, 2016, the U.S. Department of Labor issued a final rule establishing a uniform fiduciary standard for providers of investment advice and related services in connection with U.S. retirement plans and holders of individual retirement accounts, effective April 10, 2017. As reported previously, the rule will impose new requirements and costs on our U.S. Wealth Management brokers and investment advisors who currently provide individualized investment advice according to a "suitability" standard rather than a fiduciary interest standard.

On April 28, 2016, the Canadian Securities Administrators proposed their own version of a regulatory "best interest standard" intended to replace the current requirement for registered advisors, dealers and representatives to deal "fairly, honestly, and in good faith" with their clients. Similar standards have been proposed or finalized in other jurisdictions, including the U.K. and Australia.

While these impacts are not expected to materially affect our overall results, the U.S. rules could significantly impact our U.S. Wealth Management business. We are considering ways to minimize these impacts, including through changes to our current business structure and product offerings.

Regulatory Capital and Related Requirements

We continue to monitor and prepare for developments related to regulatory capital. The BCBS has issued a number of proposed revisions and new measures on a consultative basis 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. The BCBS expects these proposals to have a relatively modest impact on capital and leverage for most banks upon finalization. For further details on regulatory capital and related requirements, refer to the Capital Management section.

U.K. and European regulatory reform

In March 2016, certain RBC entities became subject to the U.K. Senior Managers Regime, which places a statutory duty on certain employees to take reasonable steps to prevent regulatory breaches in their areas of responsibility. A certification regime also applied to employees performing 'significant harm' roles. New conduct rules will also apply to in-scope employees from March 2017.

The Market Abuse Regulation became effective July 2016 and brought changes to the civil regime for market abuse in the EU, establishing rules relating to investment recommendations, market soundings, insider lists, and monitoring of suspicious transactions and orders.

Various articles within the Securities Financing Transactions Regulation took effect in 2016, including conditions around the re-use of collateral provided in the form of securities by EU counterparties.

The Packaged Retail and Insurance-based Investment Products (PRIIPs) Regulation, effective December 2016, requires prescribed disclosure documents to be provided to retail investors before they purchase PRIIPs. We will be responsible for creating and updating these documents for products which are manufactured by us, and for providing the relevant documents to clients who purchase PRIIPs from us, whether manufactured by us or by third parties.

MiFID II/MiFIR becomes effective January 2018 and will have a significant technological and procedural impact for certain businesses operating in the EU. The reforms will introduce changes to pre- and post-trade transparency, market structure, trade and transaction reporting, algorithmic trading, and conduct of business.

Following the result of the June 2016 referendum, the U.K. is planning to exit the EU. A formal notice of the U.K. Government's intention to withdraw from the EU must be provided to European Council, triggering a two-year negotiation period during which the terms of the U.K.'s exit will be determined. Until those negotiations are concluded or the negotiation period expires, the U.K. will remain an EU Member State, subject to all EU legislation.

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, relative 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. For example, our payments business is facing intense competition from emerging non-traditional competitors. This competition could also reduce net interest income, fee revenue and adversely affect our results.

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.

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.

Business and economic conditions

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. 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 an 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 and 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. For further details on

economic and market factors which may impact our financial performance, refer to the Wealth Management, Investor & Treasury Services and Capital Markets sections.

Government fiscal, monetary and other policies
Our businesses and earnings are affected by the fiscal, monetary or other policies that are adopted by the Bank of Canada and various other Canadian regulatory authorities, the Fed in the U.S. and other U.S. government authorities, as well as those adopted by international regulatory authorities and agencies in jurisdictions in which we operate. 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 CAO & 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:

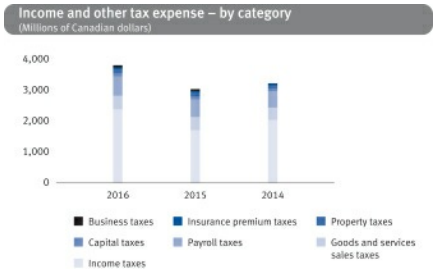
- Act with integrity and in a straightforward, open and honest manner in all tax matters;
- Ensure tax strategy is aligned with our business strategy supporting only bona fide transactions with a business purpose and economic substance;
- Ensure our full compliance and full disclosure to tax authorities 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.

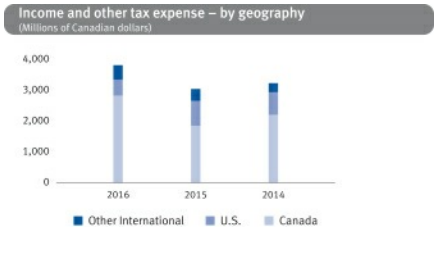
With respect to assessing the needs of our clients, we consider a number of factors including the purposes of the transaction. We seek to ensure that we only support bona fide client transactions with a business purpose and economic substance. Should we become aware of client transactions that are aimed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

We operate in 38 countries worldwide. Our activities in these countries are subject to both Canadian and international tax legislation and other regulation, 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 has 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 2016, total income and other tax expense to various levels of governments globally totalled $3.8 billion (2015 – $3.1 billion; 2014 – $3.2 billion). In Canada, total income and other tax expense for the year ended October 31, 2016 to various levels of government totalled $2.8 billion (2015 – $1.9 billion; 2014 – $2.2 billion).





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

Environmental risk
Environmental risk is the risk of loss to financial, operational or reputational value resulting from the impact of environmental issues. It arises from the business activities and operations of both us and our clients. Environmental issues that lead to environmental risk are broad and may include: air emissions, wastewater discharge, waste management, site contamination, environmental regulation, climate change and community and social impacts. Group Risk Management (GRM) is responsible for establishing policy requirements for the identification, assessment, control, monitoring and reporting of environmental risk, and for ensuring the policies are reviewed and updated periodically. The environmental risk associated with our clients and their operations is evaluated in order to establish the due diligence requirements for transactions. Business segments and corporate functions are responsible for incorporating environmental risk management requirements and controls within their operations.

We are a signatory to the Equator Principles and applies its credit risk management framework to determine, assess and manage environmental and social risks in project finance transactions. RBC Global Asset Management is a signatory to the UN Principles for Responsible Investment. Our approach to responsible investment integrates environmental, social and governance (ESG) issues into the investment process when doing so may have a material impact on our investment risk or return. Through the Carbon Disclosure Project we regularly publish corporate disclosure on risks associated with climate change and the management of greenhouse gas emissions from our own operations. We will continue to investigate and assess climate change risks related to the physical effects of changing climate, transitioning to a low-carbon economy, and regulatory requirements, and appropriate future climate-related financial disclosures. RBC Corporate Citizenship sets corporate environmental strategy and reports annually on environmental management in the Corporate Responsibility Report and Public Accountability Statements.

Property insurance businesses can be affected due to changing climate patterns and an increase in the number and cost of claims associated with severe storms and other natural disasters. On July 1, 2016, we completed the sale of RBC General Insurance Company to Aviva Canada Inc., which involved the sale of our home and auto insurance manufacturing business. RBC Insurance had already exited the Property Reinsurance market in 2006. As a result of these transactions, RBC Insurance does not have any exposure to losses related to property and auto insurance.

Other factors

Other factors that may affect actual 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

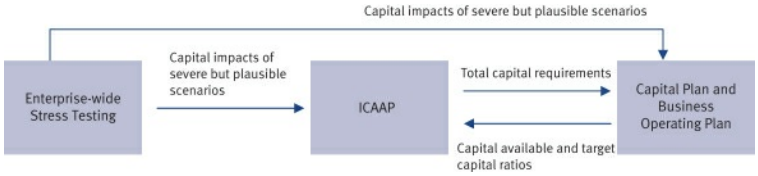
We actively manage our capital to maintain strong capital ratios and high ratings while providing strong returns to our shareholders. In addition to the regulatory requirements, we consider the expectations of credit rating agencies, depositors and shareholders, as well as our business plans, stress 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 better returns for our shareholders, while protecting depositors and senior creditors.

Capital management framework

Our capital management framework provides the policies and processes for defining, measuring, raising and investing all types of capital in a co-ordinated and consistent manner. It includes our overall approach to capital management, including guiding principles as well as 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 subsidiary capital.

Our capital planning is a dynamic process which 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. The integral parts of our capital planning are comprised of our business operating plans, enterprise-wide stress testing and Internal Capital Adequacy Assessment Process (ICAAP), along with the considerations of regulatory capital requirements 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, 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 testing and ICAAP provide key inputs for capital planning, including setting the appropriate 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 exceptional adverse events. ICAAP is an OSFI mandated annual process to assess capital adequacy and requirements to cover all material risks, with a cushion to cover severe but plausible contingencies. In accordance with the OSFI guideline, the major components of our ICAAP process include comprehensive risk assessment, stress testing, capital assessment and planning (both economic and regulatory capital), 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 the 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 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 established 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 regulatory capital requirements are determined by guidelines issued by OSFI, which are based on the minimum Basel III capital ratios proposed by the Basel Committee on Banking Supervision (BCBS). Our capital requirements are determined at a consolidated level.

The BCBS sets out the Basel III transitional requirements for Common Equity Tier 1 capital (CET1), Tier 1 capital and Total capital ratios at 5.125%, 6.625% and 8.625%, respectively for 2016, 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 domestic systemic important bank (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 that a bank may consider. Under the option selected by RBC, the CVA capital charge for CET1, Tier 1 capital and Total capital was 64%, 71%, and 77%, respectively, for 2016. In 2017, the CVA capital charge will be 72%, 77% and 81%, 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 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 floor. We commenced reflecting operational risk capital under the AMA in the third quarter of 2016.

In October 2014, OSFI issued its "Leverage Requirements (LR) Guideline", which replaced the OSFI Assets-to-Capital Multiple (ACM) with the Basel III Leverage ratio, beginning in the first quarter of 2015. The leverage ratio is defined as Tier 1 capital divided by leverage ratio exposure. The leverage ratio exposure is the sum of (a) on-balance sheet exposures; (b) derivative exposures; (c) securities financing transaction exposures and (d) off-balance sheet items. Canadian banks are expected to maintain a leverage ratio that meets or exceeds 3% at all times.

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. We were not designated as a G-SIB as of November 2016. However, as we met the BCBS size threshold, we disclosed the 12 indicators using the OSFI prescribed template for the financial years ended 2014 and 2015 in our Q2 2016 Report to Shareholders.

In January 2016, BCBS issued the revised minimum capital requirements for market risk, with an effective date no later than December 2019. The purpose of the revised market risk framework is to ensure that the standardized and internal model approaches to market risk deliver credible capital outcomes and promote consistent implementation of the standards across jurisdictions.

In March 2016, the BCBS released a consultation paper entitled, *"Pillar 3 disclosure requirements – consolidated and enhanced framework"* . The proposed disclosure enhancements include the addition of a dashboard of key metrics and the disclosure of a risk-weighted asset benchmark determined only by the application of Basel standardized approaches, referred to as the hypothetical risk-weighted asset disclosure. In addition, the proposal also includes enhanced granularity for disclosure of prudent valuation adjustments and incorporates additions to the Pillar 3 framework to reflect ongoing reforms to the regulatory framework, such as the total loss-absorbing capacity regime for G-SIBs, the proposed operational risk framework, and the final standard for market risk. The BCBS's proposal would also consolidate all existing Pillar 3 disclosure requirements of the Basel framework, including the leverage and liquidity ratios disclosure templates. Together with the BCBS Revised Pillar 3 disclosure requirements issued in January 2015, the proposed disclosure requirements included in this consultation paper would comprise the single Pillar 3 framework. OSFI originally required D-SIBs to implement the Basel Pillar 3 disclosure requirement by October 31, 2017, however, in August 2016, the implementation date was extended to October 31, 2018. OSFI's final Pillar 3 guideline is expected to be issued in 2017.

In July 2016, BCBS issued an updated version of the Basel III Document – Revisions to the securization framework, incorporating simple, transparent, and comparable securitization requirements. The revisions set out revised methodologies for the calculation of regulatory capital requirements for securitization exposures held by banks in the banking book in order to address certain shortcomings identified by the Basel Committee under the current Basel II securitization framework. It is expected to become effective in January 2018.

We continue to monitor and prepare for developments related to regulatory capital and leverage. The BCBS has issued a number of proposed revisions and new measures on a consultative basis 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 BCBS is currently reviewing feedback and commentary on these revisions and will likely finalize these proposals in early 2017. The BCBS has indicated it does not expect these proposals to significantly increase capital and leverage for most banks upon finalization.

The following table provides a summary of OSFI regulatory target ratios under Basel III:

Basel III – OSFI regulatory target **Table 71**

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, 2016	Meet or exceed OSFI regulatory target ratios
	Minimum	Capital Conservation Buffer	Minimum including Capital Conservation Buffer	D-SIB Surcharge (1)	Minimum including Capital Conservation Buffer and D-SIB surcharge (1)		
Common Equity Tier 1	> 4.5%	2.5%	> 7.0%	1.0%	> 8.0%	10.8%	ü
Tier 1 capital	> 6.0%	2.5%	> 8.5%	1.0%	> 9.5%	12.3%	ü
Total capital	> 8.0%	2.5%	> 10.5%	1.0%	> 11.5%	14.4%	ü
Leverage ratio	> 3.0%	n.a.	> 3.0%	n.a.	> 3.0%	4.4%	ü

(1) Effective January 1, 2016, the D-SIBs surcharge is applicable to risk-weighted capital.
n.a. not applicable

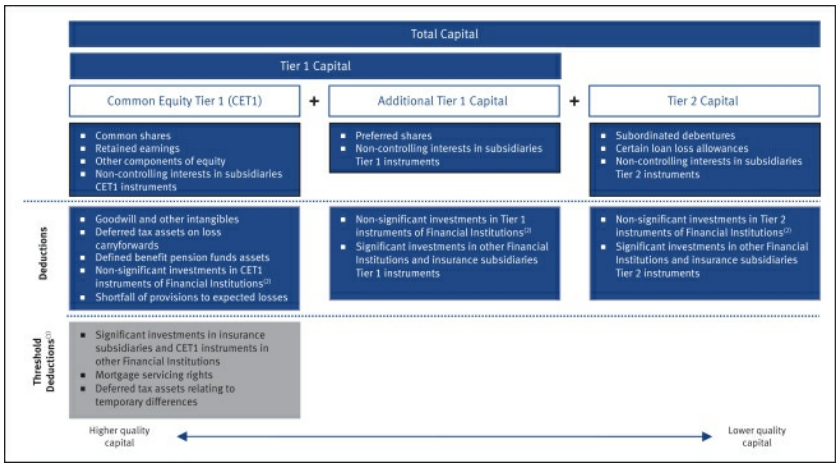
Regulatory capital, RWA and capital ratios
Under Basel III, regulatory capital consists of CET1, Additional Tier 1 and Tier 2 capital.

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 NVCC features to be included into regulatory capital. For further details on NVCC, refer to the discussion above.

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 CAR criteria that drive the amount eligible for deduction.

The following tables provide details on our regulatory capital, RWA and capital ratios. Our capital position remained strong and our capital ratios remain well above OSFI regulatory targets:

Regulatory capital, risk-weighted assets (RWA) and capital ratios **Table 72**

(Millions of Canadian dollars, except percentage and multiple amounts and as otherwise noted)	As at October 31 2016	October 31 2015
Capital (1)		
CET1 capital	**$ 48,181**	$ 43,715
Tier 1 capital	**55,270**	50,541
Total capital	**64,950**	58,004
Risk-weighted Assets (RWA) used in calculation of capital ratios (1), (2)		
CET1 capital RWA	**447,436**	411,756
Tier 1 capital RWA	**448,662**	412,941
Total capital RWA	**449,712**	413,957
Total capital RWA consisting of: (1)		
Credit risk	**$ 369,751**	$ 323,870
Market risk	**23,964**	39,786
Operational risk	**55,997**	50,301
Total capital RWA	**$ 449,712**	$ 413,957
Capital ratios and Leverage ratio (1), (3)		
CET1 ratio	**10.8%**	10.6%
Tier 1 capital ratio	**12.3%**	12.2%
Total capital ratio	**14.4%**	14.0%
Leverage ratio	**4.4%**	4.3%
Leverage ratio exposure (billions)	**$ 1,265.1**	$ 1,170.2

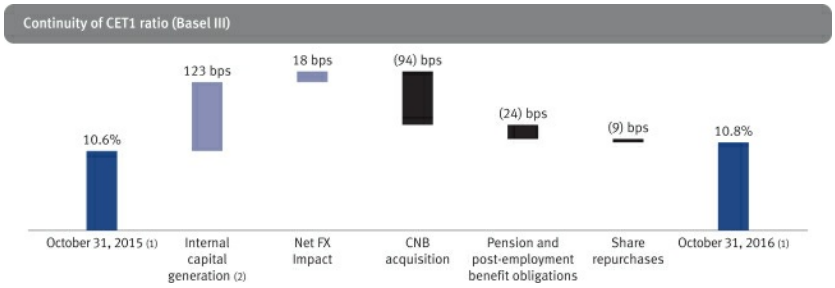
(1) Capital, RWA, and capital ratios are calculated using OSFI Capital Adequacy Requirements based on the Basel III framework. Leverage ratios are calculated using OSFI Leverage Requirements Guideline based on the Basel III framework.

(2) In 2015 and 2016, the CVA scalars of 64%, 71% and 77% were applied to CET1, Tier 1 and Total Capital, respectively. In fiscal 2017, the scalars will be 72%, 77% and 81%, respectively.

(3) To enhance comparability among other global financial institutions, our transitional CET1, Tier 1, Total capital and leverage ratios as at October 31, 2016 were 11.8%, 12.3%, 14.4%, 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.

Regulatory Capital		Table 73
	All-in basis	
(Millions of Canadian dollars)	**2016**	2015
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	**$ 18,161**	$ 14,739
Retained earnings	**41,217**	37,645
Accumulated other comprehensive income (and other reserves)	**4,926**	4,626
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	**(16,136)**	(13,308)
Common Equity Tier 1 capital (CET1)	**$ 48,181**	$ 43,715
Additional Tier 1 capital: instruments and regulatory adjustments		
Directly issued qualifying Additional Tier 1 instruments plus related stock surplus	**3,825**	2,350
Directly issued capital instruments to phase out from Additional Tier 1	**3,261**	4,473
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)	**7,089**	6,826
Tier 1 capital (T1 = CET1 + AT1)	**$ 55,270**	$ 50,541
Tier 2 capital: instruments and provisions and regulatory adjustments		
Directly issued qualifying Tier 2 instruments plus related stock surplus	**6,630**	3,073
Directly issued capital instruments subject to phase out from Tier 2	**2,738**	4,227
Tier 2 instruments issued by subsidiaries and held by third parties (amount allowed in group Tier 2)	**18**	29
Collective allowance	**294**	134
Regulatory adjustments applied to Tier 2 under Basel III	**–**	–
Tier 2 capital (T2)	**$ 9,680**	$ 7,463
Total capital (TC = T1 + T2)	**$ 64,950**	$ 58,004

2016 vs. 2015



(1) Represents rounded figures.
(2) Internal capital generation includes $5.1 billion which represents Net income available to shareholders, less common and preferred shares dividends and excludes $235 million relating to the gain on the sale of RBC General Insurance Company to Aviva Canada Inc.

Our CET1 ratio was 10.8%, up 20 bps from last year, mainly reflecting internal capital generation and the impact of foreign exchange translation. These factors were partially offset by the acquisition of City National, the impact of lower discount rates in determining our pension and other post-employment benefit obligations, and share repurchases.

Our Tier 1 capital ratio of 12.3% was up 10 bps, mainly due to the factors noted above under the CET1 ratio and the net issuance of additional Tier 1 capital instruments.

Our Total capital ratio of 14.4% was up 40 bps, mainly due to the factors noted above under the Tier 1 capital ratio and the net issuance of subordinated debentures.

Our Leverage ratio was up 10 bps, mainly due to internal capital generation, partially offset by the acquisition of City National and higher leverage ratio exposures reflecting business growth, primarily in loans.

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 transitional adjustment to RWA must be applied as prescribed by OSFI CAR guidelines.

Total capital risk-weighted assets **Table 74**

As at October 31 (Millions of Canadian dollars, except percentage amounts)	2016					2015
			Risk-weighted assets			
	Exposure (1)	Average of risk weights (2)	Standardized approach	Advanced approach	Other	Total	Total
Credit risk							
Lending-related and other							
Residential mortgages	$ 232,398	7%	$ 6,546	$ 10,818	$ –	$ 17,364	$ 12,797
Other retail	230,376	23%	5,632	46,532	–	52,164	51,157
Business	319,208	58%	42,933	143,352	–	186,285	151,565
Sovereign	103,218	9%	2,929	6,847	–	9,776	9,175
Bank	123,799	10%	2,161	9,640	–	11,801	7,695
Total lending-related and other	$ 1,008,999	27%	$ 60,201	$ 217,189	$ –	$ 277,390	$ 232,389
Trading-related							
Repo-style transactions	$ 396,013	2%	$ 69	$ 7,780	$ 75	$ 7,924	$ 6,680
Derivatives – including CVA – CET1 phase-in adjustment	96,565	31%	815	17,197	11,784	29,796	29,332
Total trading-related	$ 492,578	8%	$ 884	$ 24,977	$ 11,859	$ 37,720	$ 36,012
Total lending-related and other and trading-related	$ 1,501,577	21%	$ 61,085	$ 242,166	$ 11,859	$ 315,110	$ 268,401
Bank book equities	2,442	97%	–	2,362	–	2,362	2,045
Securitization exposures	59,933	16%	2,891	6,700	–	9,591	7,363
Regulatory scaling factor	n.a.	n.a.	n.a.	15,028	–	15,028	14,400
Other assets	45,259	56%	n.a.	n.a.	25,384	25,384	29,460
Total credit risk	$ 1,609,211	23%	$ 63,976	$ 266,256	$ 37,243	$ 367,475	$ 321,669
Market risk							
Interest rate			$ 1,835	$ 2,649	$ –	$ 4,484	$ 8,174
Equity			1,518	1,487	–	3,005	3,731
Foreign exchange			875	56	–	931	988
Commodities			313	13	–	326	956
Specific risk			3,824	1,906	–	5,730	11,800
Incremental risk charge			–	9,488	–	9,488	14,137
Total market risk			$ 8,365	$ 15,599	$ –	$ 23,964	$ 39,786
Operational risk			$ 3,891	52,106	n.a.	$ 55,997	$ 50,301
CET1 capital risk-weighted assets (3)	$ 1,609,211		$ 76,232	333,961	37,243	$ 447,436	$ 411,756
Additional CVA adjustment, prescribed by OSFI, for Tier 1 capital					1,226	1,226	1,185
Tier 1 capital risk-weighted assets (3)	$ 1,609,211		$ 76,232	333,961	38,469	$ 448,662	$ 412,941
Additional CVA adjustment, prescribed by OSFI, for Total capital					1,050	1,050	1,016
Total capital risk-weighted assets (3)	$ 1,609,211		$ 76,232	$ 333,961	$ 39,519	$ 449,712	$ 413,957

(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) In fiscal 2015 and 2016, the CVA scalars of 64%, 71% and 77%, were applied to CET1, Tier 1 and Total Capital, respectively. In 2017, the scalars will be 72%, 77% and 81%, respectively.
n.a. not applicable

2016 vs. 2015

During the year, CET1 RWA was up $36 billion, primarily as a result of the acquisition of City National and higher RWA (excluding the impact of foreign exchange translation), mainly in loans, partially offset by the impact of foreign exchange translation.

Selected capital management activity

The following table provides our selected capital management activity for the year ended October 31, 2016.

Selected capital management activity — **Table 75**

(Millions of Canadian dollars, except number of shares)	2016 Issuance or redemption date	2016 Number of shares (000s)	2016 Amount
Tier 1 capital			
Common shares issued			
Issued in connection with share-based compensation plans (1)		**4,981**	**$ 307**
Issued in connection with the acquisition of City National	**November 2, 2015**	**41,619**	**3,115**
Purchased for cancellation (2)		**(4,629)**	**(56)**
Issuance of preferred shares Series BK (3), (4)	**December 16, 2015**	**29,000**	**725**
Issuance of preferred shares Series BM (3), (4)	**March 7, 2016**	**30,000**	**750**
Redemption of RBC Trust Capital Securities – Series 2015 (3)	**December 31, 2015**		**(1,200)**
Tier 2 capital			
Issuance of January 20, 2026 subordinated debentures (3), (4)	**January 20, 2016**		**1,500**
Issuance of January 27, 2026 subordinated debentures (3), (4)	**January 27, 2016**		**2,106**
Redemption of November 2, 2020 subordinated debentures (3)	**November 2, 2015**		**(1,500)**
Other			
Issuance of preferred shares Series C-1 (3), (5)	**November 2, 2015**	**175**	**227**
Issuance of preferred shares Series C-2 (3), (5)	**November 2, 2015**	**100**	**153**
Purchase for cancellation of preferred shares Series C-1 (3), (5)	**February 24, 2016**	**(93)**	**(120)**
Purchase for cancellation of preferred shares Series C-2 (3), (5)	**February 24, 2016**	**(80)**	**(122)**

(1) Amounts include cash received for stock options exercised during the period and the fair value adjustments to stock options.
(2) Based on book value.
(3) For further details, refer to Notes 19 and 21 of our audited 2016 Annual Consolidated Financial Statements.
(4) Non-Viable Contingent Capital (NVCC) capital instruments.
(5) Based on fair value.

On May 30, 2016, we announced our normal course issuer bid (NCIB), which commenced on June 1, 2016 and continues until May 31, 2017. In 2016, we repurchased approximately 4.6 million of our common shares. The total cost of the shares repurchased was $362 million, comprised of a book value of $56 million, with an additional $306 million premium paid on repurchase.

Dividends

Our common share dividend policy reflects our earnings outlook, payout ratio objective and the need to maintain adequate levels of capital to fund business opportunities. In 2016, our dividend payout ratio was 48%, which met our dividend payout ratio target of 40% to 50%. Common share dividends paid during the year were $4.8 billion.

Selected share data (1) **Table 76**

(Millions of Canadian dollars, except number of shares and as otherwise noted)	2016 Number of shares (000s)	2016 Amount	2016 Dividends declared per share	2015 Number of shares (000s)	2015 Amount	2015 Dividends declared per share	2014 Number of shares (000s)	2014 Amount	2014 Dividends declared per share
Common shares outstanding	**1,485,394**	**$ 17,939**	**$ 3.24**	1,443,423	$14,573	$ 3.08	1,442,233	$ 14,511	$ 2.84
First preferred shares outstanding									
Non-cumulative Series W (2)	**12,000**	**300**	**1.23**	12,000	300	1.23	12,000	300	1.23
Non-cumulative Series AA	**12,000**	**300**	**1.11**	12,000	300	1.11	12,000	300	1.11
Non-cumulative Series AB	**12,000**	**300**	**1.18**	12,000	300	1.18	12,000	300	1.18
Non-cumulative Series AC	**8,000**	**200**	**1.15**	8,000	200	1.15	8,000	200	1.15
Non-cumulative Series AD	**10,000**	**250**	**1.13**	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AE	**10,000**	**250**	**1.13**	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AF	**8,000**	**200**	**1.11**	8,000	200	1.11	8,000	200	1.11
Non-cumulative Series AG	**10,000**	**250**	**1.13**	10,000	250	1.13	10,000	250	1.13
Non-cumulative Series AJ (3)	**13,579**	**339**	**0.88**	13,579	339	0.88	13,579	339	0.97
Non-cumulative Series AK (3)	**2,421**	**61**	**0.60**	2,421	61	0.67	2,421	61	0.53
Non-cumulative Series AL (3)	**12,000**	**300**	**1.07**	12,000	300	1.07	12,000	300	1.15
Non-cumulative Series AN (3)	**–**	**–**	**–**	–	–	–	–	–	0.39
Non-cumulative Series AP (3)	**–**	**–**	**–**	–	–	–	–	–	0.39
Non-cumulative Series AR (3)	**–**	**–**	**–**	–	–	–	–	–	0.39
Non-cumulative Series AT (3)	**–**	**–**	**–**	–	–	–	–	–	1.17
Non-cumulative Series AV (3)	**–**	**–**	**–**	–	–	–	–	–	1.17
Non-cumulative Series AX (3)	**–**	**–**	**–**	–	–	–	13,000	325	1.53
Non-cumulative Series AZ (3), (4)	**20,000**	**500**	**1.00**	20,000	500	1.00	20,000	500	0.50
Non-cumulative Series BB (3), (4)	**20,000**	**500**	**0.98**	20,000	500	0.98	20,000	500	0.46
Non-cumulative Series BD (3), (4)	**24,000**	**600**	**0.90**	24,000	600	0.73	–	–	–
Non-cumulative Series BF (3), (4)	**12,000**	**300**	**0.90**	12,000	300	0.63	–	–	–
Non-cumulative Series BH (4)	**6,000**	**150**	**1.23**	6,000	150	0.58	–	–	–
Non-cumulative Series BI (4)	**6,000**	**150**	**1.23**	6,000	150	0.42	–	–	–
Non-cumulative Series BJ (4)	**6,000**	**150**	**1.51**	6,000	150	–	–	–	–
Non-cumulative Series BK (3), (4)	**29,000**	**725**	**1.29**	–	–	–	–	–	–
Non-cumulative Series BM (3), (4)	**30,000**	**750**	**0.98**	–	–	–	–	–	–
Non-cumulative Series C-1 (5)	**82**	**107**	**US$ 55.00**	–	–	–	–	–	–
Non-cumulative Series C-2 (5)	**20**	**31**	**US$ 67.50**	–	–	–	–	–	–
Treasury shares held – preferred	**31**	**–**		(63)	(2)		1	–	
Treasury shares held – common	**(1,159)**	**(80)**		532	38		892	71	
Stock options									
Outstanding (6)	**11,388**			8,182			8,579		
Exercisable	**6,909**			5,231			4,987		
Dividends									
Common		**4,817**			4,443			4,097	
Preferred		**294**			191			213	

(1) For further details about our capital management activity, refer to Note 21 of our audited 2016 Annual Consolidated Financial Statements.
(2) Effective February 24, 2010, we have the right to convert into common shares at our option, subject to certain restrictions.
(3) Dividend rate will reset every five years.
(4) NVCC capital instruments.
(5) 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.
(6) Effective Q1 2016, includes share-based compensation awards from our acquisition of City National.

As at November 25, 2016, the number of outstanding common shares and stock options and awards was 1,485,641,741 and 11,136,292, respectively, and the number of Treasury shares – preferred and Treasury shares – common was (30,253) and (369,236), respectively.

NVCC provisions require the conversion of the capital instrument into a variable number of common shares in the event that OSFI deems the Bank to be non-viable or a federal or provincial government in Canada publicly announces that the Bank has accepted or agreed to accept a capital injection. If a NVCC trigger event were to occur, our NVCC capital instruments 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 2,762 million RBC common shares, on aggregate, which would represent a dilution impact of 65% based on the number of RBC common shares outstanding as at October 31, 2016.

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 77

(Millions of Canadian dollars)	**2016**	2015
Credit risk	**$ 20,550**	$ 16,400
Market risk (trading and non-trading)	**3,200**	3,900
Operational risk	**4,900**	4,600
Business and fixed asset risk	**3,100**	2,900
Insurance risk	**650**	550
Goodwill and other intangibles	**16,100**	11,900
Regulatory capital allocation	**8,900**	5,400
Attributed capital	**$ 57,400**	$ 45,650
Unattributed capital	**4,800**	6,650
Average common equity	**$ 62,200**	$ 52,300

2016 vs. 2015

Attributed capital increased $12 billion largely due to higher Credit and Goodwill and other intangibles risks, reflecting the acquisition of City National, business growth, and the impact of foreign exchange translation. Higher regulatory capital allocation, reflecting a higher capital attribution rate, also contributed to the increase.

The increase in Operational and Business and fixed asset risks reflects higher revenue.

Market risk decreased largely due to changes in risk treatment of certain portfolios and reduced inventories in fixed income and securitized product portfolios.

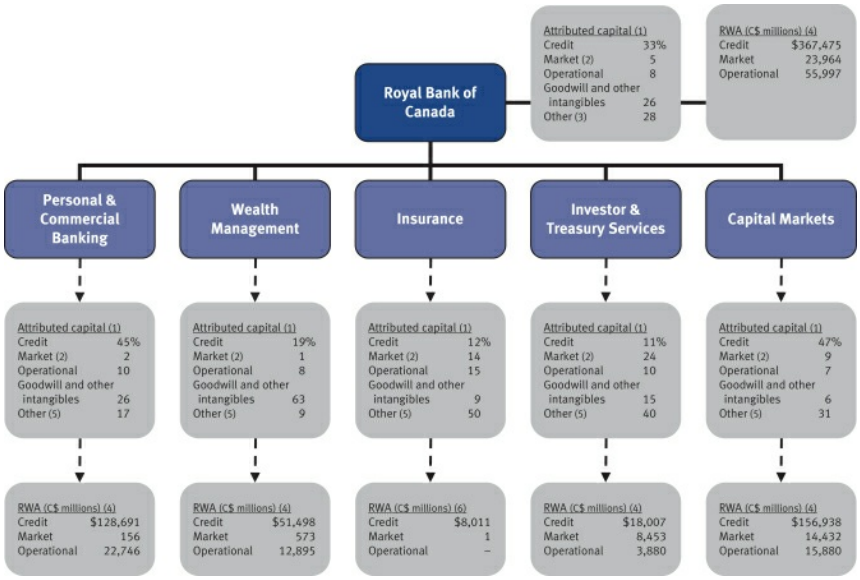
We remain well capitalized with current levels of available capital exceeding the attributed capital required to underpin all of our material risks.

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 business, 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 above represents RWA for CET1.
(5) 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.
(6) 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 our subsidiaries' capital. We invest capital across the enterprise to meet any local regulators' capital adequacy requirements and maximize returns to our shareholders. We invest in our subsidiaries as appropriate during the year. 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 its compliance with any 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 has responsibility 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 class 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.

Additional financial information

Exposure to U.S. subprime and Alt-A through RMBS, CDOs and mortgages

Certain activities and transactions we enter into expose us to the risk of default of U.S. subprime and Alt-A residential mortgages. Our exposures to U.S. subprime and Alt-A residential mortgages of $71 million represented less than 0.1% of our total assets as at October 31, 2016, compared to $423 million or less than 0.1% last year. The decrease of $352 million was primarily due to the sale of certain securities.

Commercial mortgage-backed securities

The fair value of our total direct holdings of Canadian and U.S. commercial mortgage-backed securities was $355 million as at October 31, 2016.

Assets and liabilities measured at fair value

Our financial instruments carried at fair value are classified as Level 1, 2 or 3, in accordance with the fair value hierarchy set out in International Financial Reporting Standards (IFRS) 13, *Fair Value Measurement*. For further details on the fair value of our financial instruments and transfers between levels of the fair value hierarchy, refer to Note 3 of our audited 2016 Annual Consolidated Financial Statements.

The following table presents the total fair value of each major class of financial assets and financial liabilities measured at fair value and the percentage of the fair value of each class categorized as Level 1, 2 or 3:

Assets and liabilities measured at fair value — Table 78

	As at October 31, 2016				
(Millions of Canadian dollars, except percentage amounts)	Fair value	Level 1	Level 2	Level 3	Total
Financial assets					
Securities at FVTPL	$ 151,292	40%	60%	–%	100%
Available-for-sale	69,833	6	90	4	100
Assets purchased under reverse repurchase agreements and securities borrowed	121,692	–	100	–	100
Loans	2,412	–	86	14	100
Derivatives (1)	216,086	1	99	–	100
Financial liabilities					
Deposits	$ 98,856	–%	100%	–%	100%
Obligations related to securities sold short	50,369	65	35	–	100
Obligations related to assets sold under repurchase agreements and securities loaned	88,863	–	100	–	100
Derivatives (1)	212,781	1	98	1	100

(1) The derivative assets and liabilities presented in the table above do not reflect the impact of netting.

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 audited 2016 Annual Consolidated Financial Statements. Certain of these policies, as well as estimates made by management in applying such policies, are recognized as critical because they require us to make particularly subjective or complex judgments about matters that are inherently uncertain and because of the likelihood that 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 instruments, allowance for credit losses, goodwill and other intangible assets, employee benefits, consolidation, derecognition of financial assets, securities impairment, application of the effective interest method, provisions, insurance claims and policy benefit liabilities, and income taxes. 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 all factors that market participants would consider in setting a price, including commonly accepted valuation approaches.

The Board of Directors provides oversight on valuation of financial instruments, primarily through the Audit Committee and Risk Committee. The Audit Committee reviews the presentation and disclosure of financial instruments that are measured at fair value, while the Risk Committee assesses adequacy of governance structures and control processes for valuation of these instruments.

We have established policies, procedures and controls for valuation methodologies and techniques to ensure fair value is reasonably estimated. Major valuation processes and controls include, but are not limited to, profit and loss decomposition, independent price verification (IPV) and model validation standards. These control processes are managed by either Finance or GRM and are independent of the relevant

businesses and their trading functions. Profit and loss decomposition is a process to explain the fair value changes of certain positions and is performed daily for trading portfolios. All fair value instruments are subject to IPV, a process whereby trading function valuations are verified against external market prices and other relevant market data. Market data sources include traded prices, brokers and price vendors. We give priority to those third-party pricing services and prices having 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, to other pricing service values and, when available, to 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. Valuation models are approved for use within our model risk management framework. The framework addresses, among other things, model development standards, validation processes and procedures, and approval authorities. Model validation ensures that a model is suitable for its intended use and sets parameters for its use. All models are revalidated regularly by qualified personnel who are independent of the model design and development. Annually our model risk profile is reported to the Board of Directors.

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 for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). Determination of fair value based on this hierarchy requires 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 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 in the determination of the model used, the selection of model inputs, and in some cases the application of valuation adjustments to the model value or quoted price for inactively traded financial instruments, as 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.

We record valuation adjustments to appropriately reflect counterparty credit quality of our derivative portfolio, differences between the overnight index swap (OIS) curve and London Interbank Offered Rates (LIBOR) for collateralized derivatives, funding valuation adjustments (FVA) for uncollateralized and under-collateralized OTC derivatives, unrealized gains or losses at inception of the transaction, bid-offer spreads, unobservable parameters and model limitations. These adjustments may be subjective as they require significant judgment in the input selection, such as probability of default and recovery rate, and are intended to arrive at 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 is previously estimated using management judgment, and may therefore impact unrealized gains and losses recognized in Non-interest income – Trading revenue or Other.

Valuation adjustments are recorded for the credit risk of our derivative portfolios in order to arrive at their fair values. CVA takes into account our counterparties' creditworthiness, the current and potential future mark-to-market of the transactions, and the effects of credit mitigants such as master netting and collateral agreements. CVA amounts are derived from estimates of exposure at default, probability of default, recovery rates on a counterparty basis, and market and credit factor correlations. Exposure at default is the amount of expected derivative related assets and liabilities at the time of default, estimated through modelling using underlying risk factors. Probability of default and recovery rate are generally implied from the market prices for credit protection and credit ratings of the counterparty. Correlation is the statistical measure of how credit and market factors may move in relation to one another. Correlation is estimated using historical data and market data where available. CVA is calculated daily and changes are recorded in Non-interest income – Trading revenue.

In the determination of fair value of collateralized OTC derivatives using the OIS curve, our valuation approach accounts for the difference between certain OIS rates and LIBOR for derivatives valuation as valuation adjustments.

FVA are also calculated to incorporate cost and benefit of funding in the valuation of uncollateralized and under-collateralized OTC derivatives. Future expected cash flows of these derivatives are discounted to reflect the cost and benefit of funding the derivatives by using a funding curve, implied volatilities and correlations as inputs.

Where required, a valuation adjustment is made to reflect the unrealized gain or loss at inception of a financial instrument contract where the fair value of that financial instrument is not obtained from a quoted market price or cannot be evidenced by other observable market transactions based on a valuation technique incorporating observable market data.

A bid-offer valuation adjustment is required when a financial instrument is valued at the mid-market price, instead of the bid or offer price for asset or liability positions, respectively. The valuation adjustment takes into account the spread from the mid to either the bid or offer price.

Some valuation models require parameter calibration from such factors as market observed option prices. The calibration of parameters may be sensitive to factors such as the choice of instruments or optimization methodology. A valuation adjustment is also estimated to mitigate the uncertainties of parameter calibration and model limitations.

We classify our financial instruments measured at fair value on a recurring basis into three levels based on the transparency of the inputs used to measure the fair values of the instruments. As at October 31, 2016, Level 2 instruments, whose fair values are based on observable inputs, include $505 billion of financial assets (October 31, 2015 – $456 billion) and $413 billion of financial liabilities (October 31, 2015 – $394 billion). These amounts represent 87% of our total financial assets at fair value (October 31, 2015 – 85%) and 92% of our total financial liabilities at fair value (October 31, 2015 – 91%), respectively. Level 3 instruments, whose valuations include significant unobservable inputs, include $4 billion of financial assets (October 31, 2015 – $6 billion) and $2 billion of financial liabilities (October 31, 2015 – $2 billion), representing 1% of our total financial assets at fair value (October 31, 2015 – 1%) and 0.4% of our total financial liabilities at fair value (October 31, 2015 – 1%), respectively.

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. 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. For U.S. non-agency MBS,

recovery rates are largely dependent upon forecasted property prices which were assessed at the municipal level, provided by a third-party vendor. In addition, we also consider the transaction structure and credit enhancement for the structured securities. If the result indicates 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. In assessing whether there is any objective evidence that suggests that the security is impaired we consider factors which include the length of time and extent the fair value has been below the cost and the financial condition and near term prospects of the issuer. We also consider the estimated recoverable value and the period of recovery. We conduct further analysis for securities where the fair value had been below cost for greater than twelve months. If an AFS security is impaired, the cumulative unrealized losses previously recognized in Other components of equity are recognized directly in income under Non-interest income. As at October 31, 2016, our gross unrealized losses on AFS securities were $254 million (October 31, 2015 – $304 million). Refer to Note 4 to our audited 2016 Annual Consolidated Financial Statements for more information.

Allowance for credit losses

We maintain 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 management considers appropriate to cover credit related losses incurred as at the balance sheet date.

Allowances are determined individually for loans that are individually significant, and collectively for loans that are not individually significant and loans which are significant but for which there is no objective evidence of impairment, using current and historical credit information in both quantitative and qualitative assessments. For further information on allowance for credit losses, refer to Note 5 to our audited 2016 Annual Consolidated Financial Statements.

Individually assessed loans

Loans which are individually significant are assessed individually for objective indicators of impairment. A loan is considered impaired when management determines that it will not be able to collect all amounts due according to the original contractual terms or the equivalent value.

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 amount 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.

Collectively assessed loans

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 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, in portfolios of similar credit risk characteristics, 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 and 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 the contractual cash flows of the loans in the group and historical loss experience for loans with credit risk characteristics similar to those in the group. Historical loss experience is adjusted based on current observable data to reflect the effects of current conditions that did not affect the period on which the historical loss experience is based and to remove the effects of conditions in the historical period that do not currently exist. The methodology and assumptions used for estimating future cash flows are reviewed regularly to reduce any differences between loss estimates and actual loss experience.

Write-off of loans

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 credit cards, the balances and related allowance for credit losses are written off when payment is 180 days in arrears. Personal loans are generally written off at 150 days past due.

Total allowance for credit losses

Based on the procedures discussed above, management believes that the total allowance for credit losses of $2,326 million is adequate to absorb estimated credit losses incurred in the lending portfolio as at October 31, 2016 (October 31, 2015 – $2,120 million). This amount includes $91 million (October 31, 2015 – $91 million) classified in Provisions under Other liabilities on our Consolidated Balance Sheets, which relates to off-balance sheet and other items.

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. A CGU's recoverable amount is the higher of its fair value less cost of disposal and its value in use. The carrying amount of a CGU comprises the carrying amount of assets, liabilities, and goodwill allocated to the CGU. When the carrying value of a CGU exceeds its recoverable amount, the impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the CGU and then to the other assets of the CGU proportionally based on the carrying amount of each asset. Any impairment charge is recognized in income in the period it is identified. Subsequent reversals of goodwill impairment are prohibited.

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.

Other intangible assets with a finite life are amortized on a straight-line basis over their estimated useful lives as follows: computer software – 3 to 10 years and customer relationships – 10 to 20 years. They are assessed for indicators of impairment 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. If the recoverable amount of the asset (or CGU) is less than its carrying amount, the carrying amount of the intangible asset is written down to its recoverable amount as an impairment loss. An impairment loss recognized previously is reversed if there is a change in the estimates used to determine the recoverable amount of the asset (or CGU) since the last impairment loss was recognized. If an impairment loss is subsequently reversed, the carrying amount of the asset (or CGU) is revised to the lower of its recoverable amount and the carrying amount that would have been determined (net of amortization) had there been no prior impairment.

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.

As at October 31, 2016, we had $11.2 billion of goodwill (October 31, 2015 – $9.3 billion) and $4.6 billion of other intangible assets (October 31, 2015 – $2.8 billion). For further details, refer to Notes 2 and 10 to our 2016 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. The discount rate assumption is determined using spot rates from a derived AA corporate bond yield curve for our Canadian pension and other post-employment benefit plans, and spot rates from an AA corporate bond yield curve for our International pension and other post-employment benefit plans. All other assumptions are determined by management 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 audited 2016 Annual Consolidated Financial Statements.

Consolidation

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 in an agency capacity. 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 assessing the relevant factors and conditions in totality when determining whether we control an entity. Specifically, judgment is applied in 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.

Non-controlling interests in subsidiaries that we consolidate are shown on our Consolidated Balance Sheets as a separate component of equity which is distinct from our shareholders' equity. The net income attributable to non-controlling interests is separately disclosed in our Consolidated Statements of Income.

For further details, refer to the Off-balance sheet arrangements section and Note 7 to our audited 2016 Annual Consolidated Financial Statements.

Derecognition of financial assets

We periodically enter into transactions in which we transfer financial assets such as loans or packaged MBS to structured entities or trusts that issue securities to investors. We derecognized 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 these 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. As at October 31, 2016, the carrying and fair values of the transferred assets that do not qualify for derecognition were $137 billion and $137 billion, respectively (October 31, 2015 – $119 billion and $119 billion, respectively), and the carrying and fair values of the associated liabilities totalled $137 billion and $138 billion, respectively (October 31, 2015 – $119 billion and $120 billion, respectively). For further information on derecognition of financial assets, refer to Note 6 to our audited 2016 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. 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. 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.

We are required to estimate the results of ongoing legal proceedings, expenses to be incurred to dispose of capital assets, and credit losses on undrawn commitments and guarantees. 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 audited 2016 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 the interpretation of the relevant tax laws and in the estimation of the provision for current and deferred income taxes, including the expected timing and amount of the realization. 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 24 to our audited 2016 Annual Consolidated Financial Statements for further information.

Changes in accounting policies and disclosure

As a result of the acquisition of City National, we updated our accounting policies in the first quarter to reflect policies on Acquired Loans, Acquired Credit-Impaired Loans and Federal Deposit Insurance Corporation Covered Loans. Refer to Note 2 of our audited 2016 Annual Consolidated Financial Statements for details of these changes.

Future changes in accounting policy and disclosure

IFRS 15 *Revenue from Contracts with Customers* (IFRS 15)

In May 2014, the International Accounting Standards Board (IASB) issued IFRS 15 which establishes 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. 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.

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 will be 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.

On June 21, 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 guideline is consistent with the BCBS *Guidance on credit risk and accounting for expected credit losses* , issued on December 18, 2015, which sets out supervisory expectations on sound credit risk practices associated with the implementation of expected credit loss accounting models. The OSFI guideline will be effective for us on November 1, 2017, consistent with the adoption of IFRS 9.

Classification and measurement

IFRS 9 introduces a principles-based approach to the classification of financial assets. Debt instruments, including hybrid contracts, are measured at FVTPL, fair value through other comprehensive income (FVOCI) or amortized cost based on an entity's business model and the nature of the cash flows of the assets. These categories replace the existing IAS 39 classifications of 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 election can be made on initial recognition to measure them at FVOCI with no subsequent reclassification to profit or loss.

The combined application of the contractual cash flow characteristics and business model tests as at November 1, 2017 are expected to result in some differences in the classification of financial assets when compared to our classification under IAS 39. We do not expect significant changes to the classification of most financial assets on our balance sheet; however we have identified certain assets currently held at amortized cost and AFS that may be reclassified to FVTPL under IFRS 9.

For financial liabilities, IFRS 9 includes the pre-existing requirements for classification and measurement previously included in IAS 39.

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.

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 will be 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 incurred but not identified losses 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 is not expected to 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, the total allowance for credit losses is expected to increase under IFRS 9 relative to the allowance for credit losses under 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 PD, LGD, and 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 parameter while Stage 2 estimates will use a lifetime PD parameter. Stage 3 estimates will continue to leverage existing processes for estimating losses on impaired loans, but will consider the lifetime expected loss estimate produced by the Stage 2 models.

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 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, which will be validated and tested during 2017.

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 will be designed to maximize the available information that is reliable and supportable for each portfolio and may be collective in nature.

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 probability of default, 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 based on changes in lifetime PD. We have established preliminary thresholds for significant increases in credit risk which will be validated throughout 2017. Additional qualitative reviews of the staging criteria by business, finance and risk representatives will be performed to verify the positions identified as having significantly increased in risk and identify any additional positions whose credit risk has increased significantly. As a backstop, instruments that are 30 days past due will move to Stage 2 even if our other metrics do not indicate that a significant increase in credit risk has occurred.

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 is expected to 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, once it is no longer considered that credit risk has significantly increased relative to initial recognition as at 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 when 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.

Our estimation of expected credit losses is expected to be a discounted probability-weighted estimate that considers multiple future macroeconomic scenarios. Scenarios will cover our base macroeconomic expectations as well as possible upside and downside conditions, and will be designed to capture the point of non-linearity of losses. Scenarios will be probability-weighted according to our best estimate of their relative likelihood based on historical frequency and current trends and conditions and macroeconomic factors such as gross domestic product and unemployment rates.

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.

Definition of default
The definition of default used in the measurement of expected credit losses and the assessment for movement between stages is expected to 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 are still assessing whether it is appropriate to rebut this presumption for any of our products.

Regulatory capital
Under the current 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, 2016, our shortfall of accounting allowances under IAS 39 to Basel expected losses was $1.4 billion. Based on the current regulatory rules, the regulatory capital impact of an increase in our accounting allowances under IFRS 9 relative to IAS 39 will be mitigated to the extent of our current 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 expect to 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
The impairment and classification and measurement requirements of IFRS 9 will be applied retrospectively by adjusting our Consolidated Balance Sheet at November 1, 2017, the date of initial application of IFRS 9. There is no requirement to restate comparative periods other than for hedge accounting. At this stage, it is not possible to reliably quantify the potential financial effect to the Bank from the adoption of IFRS 9.

To manage our transition to IFRS 9, we have 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. During fiscal 2015, we completed a detailed assessment of the scope and complexity of the adoption of IFRS 9 which identified areas with differences between IFRS 9 and IAS 39 and secured resources to complete the implementation. We continue to monitor and revisit our preliminary conclusions in order to identify any further financial, capital and business implications.

During fiscal 2016, we have continued to manage the IFRS 9 program through the completion of activities and deliverables to support the key areas of impact noted above. These include the following steps completed to date:

- Assessed the classification of financial assets based on our business model and the nature of the cash flows of the assets under review;
- Assessed the financial and economic impacts and identified process and systems requirements to ensure a successful transition;
- Continually evaluated our resourcing model, including cost analysis and timeline, to ensure that sufficient program resources are available to meet key deliverables;
- Agreed on many key accounting interpretations and formulated position papers on key issues;
- Completed design specifications for data sourcing, systems, models, controls and processes to ensure alignment between finance and risk processes and systems;
- Leveraged our stress testing and Basel expected loss processes to build new impairment models and parameters;
- Prepared dry-run expected credit loss estimates based on initial models and staging parameters;
- Designed key performance indicators to assist in assessing our dry-run and parallel run results;
- Initiated design of controls and governance over future processes, including key judgmental areas such as the forecasting and probability-weighting of future macroeconomic scenarios;
- Continued to roll out training and educational seminars to key stakeholders across the Bank in the various business platforms and functional groups; and
- Provided regular updates to the Audit Committee, Risk Committee and senior management to ensure escalation of key issues and risks.

In the upcoming year, steps we expect to complete include the following:

- Complete a parallel run, the results of which will be used to test our models and methodologies against our key performance indicators;
- Validate new impairment models through back-testing and other methods;
- Prepare for future system changes, including a tool to determine the appropriate classification of new assets, where appropriate;
- Complete documentation of updated bank-wide accounting and risk policies;
- Finalize governance and control frameworks over new processes and test internal controls;
- Document the roll-out and implementation of the IFRS 9 project and governance structure including key controls;
- Continue to provide training and educational seminars to impacted internal stakeholders; and
- Draft future external disclosures and transition adjustments.

As we prepare for our transition to IFRS 9, we continue to monitor industry interpretations of the new standard and expect to adjust our transition and implementation plans accordingly. Our IFRS 9 program remains aligned to our implementation schedule and we are on track to meet the timelines essential to our transition.

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 flow. These amendments will be effective for us on November 1, 2017.

Regulatory developments

BCBS revised Pillar 3 disclosure requirements
On March 11, 2016, the BCBS released a consultation paper entitled, *"Pillar 3 disclosure requirements – consolidated and enhanced framework"* . The proposed enhancements include the addition of a "dashboard" of key metrics, a draft disclosure requirement of hypothetical risk-weighted assets calculated based on the Basel framework's standardized approaches. The proposal also includes enhanced granularity for disclosure of prudent valuation adjustments and incorporates additions to the Pillar 3 framework to reflect ongoing reforms to the regulatory framework such as the total loss-absorbing capacity regime for global systemically important banks, the proposed operational risk framework, and the final standard for market risk. The BCBS's proposal would also consolidate all existing Pillar 3 disclosure requirements of the Basel framework, including the leverage and liquidity ratios disclosure templates. Together with the Revised Pillar 3 disclosure requirements issued in January 2015, the proposed disclosure requirements included in this consultation paper would comprise the single Pillar 3 framework.

In January 2016, OSFI issued a draft guideline indicating that all domestic systemically important banks are expected to implement the Basel Pillar 3 disclosure requirements for the reporting period ending October 31, 2017. In August 2016, OSFI revised its expectation on the implementation date to the reporting period ending October 31, 2018. The final guideline is expected to be issued in 2017.

BCBS standards on interest rate risk in the banking book
On April 21, 2016, the BCBS issued new standards for Interest Rate Risk in the Banking Book (IRRBB), which enhances disclosure requirements to promote greater consistency, transparency, and compatibility in the measurement and management of IRRBB. This includes quantitative disclosure requirements based on common interest rate shock scenarios. These disclosure requirements will be effective for us in the reporting period ending October 31, 2018.

BCBS guidance on regulatory capital treatment of accounting provisions
On October 12, 2016, the BCBS released a consultative document and a discussion paper on the regulatory treatment of accounting provisions under the Basel III regulatory capital framework. The papers address the impact of new expected credit loss accounting standards, such as 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 application regulatory guidance, refer to the Critical accounting policies and estimates section.

The consultative document sets out the BCBS's proposal to retain, for an interim period, the current regulatory treatment of credit loss provisions under the standardized and the IRB approaches. The document also considers the adoption of transitional arrangements to phase-in the impact of the new expected credit loss accounting standards on regulatory capital. The discussion paper explores policy options for the long-term regulatory treatment of loss allowances under the new expected credit loss accounting standards. Both papers are open for public comment until January 13, 2017.

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 Administrative Officer and Chief Financial Officer, to allow timely decisions regarding required disclosure.

As of October 31, 2016, management evaluated, under the supervision of and with the participation of the President and Chief Executive Officer and the Chief Administrative Officer and Chief Financial Officer, the effectiveness of our disclosure controls and procedures as defined under rules adopted by the United States Securities and Exchange Commission. Based on that evaluation, the President and Chief Executive Officer and the Chief Administrative Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of October 31, 2016.

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, 2016 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 29 of our audited 2016 Annual Consolidated Financial Statements.

Net interest income on average assets and liabilities

Table 79

(Millions of Canadian dollars, except for percentage amounts)	Average balances			Interest			Average rate		
	2016	2015	2014	**2016**	2015	2014	**2016**	2015	2014
Assets									
Deposits with other banks (1)									
Canada	**$ 11,679**	$ 8,463	$ 1,692	**$ 114**	$ 70	$ 61	**0.98%**	0.83%	3.61%
U.S.	**16,842**	5,567	540	**71**	12	1	**0.42**	0.22	0.19
Other International	**15,415**	14,837	5,227	**(18)**	(5)	14	**(0.12)**	(0.03)	0.27
	43,936	28,867	7,459	**167**	77	76	**0.38%**	0.27%	1.02%
Securities									
Trading	**153,114**	164,509	149,920	**3,366**	3,543	3,322	**2.20**	2.15	2.22
Available-for-sale	**72,440**	52,833	43,047	**1,227**	976	671	**1.69**	1.85	1.56
	225,554	217,342	192,967	**4,593**	4,519	3,993	**2.04**	2.08	2.07
Asset purchased under reverse repurchase agreements and securities borrowed	**191,243**	165,602	136,857	**1,816**	1,251	971	**0.95**	0.76	0.71
Loans (2)									
Canada									
Retail (3)	**338,270**	326,153	314,159	**11,141**	11,842	11,996	**3.29**	3.63	3.82
Wholesale (3)	**69,028**	58,946	54,681	**3,249**	2,959	2,970	**4.71**	5.02	5.43
	407,298	385,099	368,840	**14,390**	14,801	14,966	**3.53**	3.84	4.06
U.S.	**75,734**	36,581	28,402	**2,038**	780	888	**2.69**	2.13	3.13
Other International	**29,409**	31,261	25,067	**1,448**	1,301	1,125	**4.92**	4.16	4.49
	512,441	452,941	422,309	**17,876**	16,882	16,979	**3.49**	3.73	4.02
Total interest-earning assets	**973,174**	864,752	759,592	**24,452**	22,729	22,019	**2.51**	2.63	2.90
Non-interest-bearing deposits with other banks	**17,586**	19,283	13,495	**–**	–	–	**–**	–	–
Customers' liability under acceptances	**13,247**	12,423	10,725	**–**	–	–	**–**	–	–
Other assets (1)	**172,393**	156,342	122,688	**–**	–	–	**–**	–	–
Total assets	**$ 1,176,400**	$ 1,052,800	$ 906,500	**$ 24,452**	$ 22,729	$ 22,019	**2.08%**	2.16%	2.43%
Liabilities and shareholders' equity									
Deposits (4)									
Canada	**487,194**	459,679	418,780	**4,714**	5,162	5,416	**0.97%**	1.12%	1.29%
U.S.	**83,001**	68,909	50,459	**413**	214	158	**0.50**	0.31	0.31
Other International	**67,365**	62,029	54,267	**340**	347	299	**0.50**	0.56	0.55
	637,560	590,617	523,506	**5,467**	5,723	5,873	**0.86**	0.97	1.12
Obligations related to securities sold short	**50,262**	56,827	50,548	**1,579**	1,645	1,494	**3.14**	2.89	2.96
Obligations related to assets sold under repurchase agreements and securities loaned	**110,231**	84,380	68,594	**629**	337	278	**0.57**	0.40	0.41
Subordinated debentures	**8,931**	7,654	6,632	**227**	240	246	**2.54**	3.14	3.71
Other interest-bearing liabilities (1)	**15,437**	13,585	251	**19**	13	12	**0.12**	0.10	4.78
Total interest-bearing liabilities	**822,421**	753,063	649,531	**7,921**	7,958	7,903	**0.96**	1.06	1.22
Non-interest-bearing deposits	**112,071**	76,830	69,596	**–**	–	–	**–**	–	–
Acceptances	**13,248**	12,422	10,725	**–**	–	–	**–**	–	–
Other liabilities (1)	**159,215**	151,845	124,643	**–**	–	–	**–**	–	–
Total liabilities	**$ 1,106,955**	$ 994,160	$ 854,495	**$ 7,921**	$ 7,958	$ 7,903	**0.72%**	0.80%	0.92%
Equity	**69,445**	58,640	52,005	**n.a.**	n.a.	n.a.	**n.a.**	n.a.	n.a.
Total liabilities and shareholders' equity	**$ 1,176,400**	$ 1,052,800	$ 906,500	**$ 7,921**	$ 7,958	$ 7,903	**0.67%**	0.76%	0.87%
Net interest income and margin	**$ 1,176,400**	$ 1,052,800	$ 906,500	**$ 16,531**	$ 14,771	$ 14,116	**1.41%**	1.40%	1.56%
Net interest income and margin (average earning assets)									
Canada	**$ 572,671**	$ 539,333	$ 497,436	**$ 11,694**	$ 11,538	$ 11,121	**2.04%**	2.14%	2.24%
U.S.	**246,065**	165,083	135,876	**3,241**	1,977	1,896	**1.32**	1.20	1.40
Other International	**154,438**	160,336	126,280	**1,596**	1,256	1,099	**1.03**	0.78	0.87
Total	**$ 973,174**	$ 864,752	$ 759,592	**$ 16,531**	$ 14,771	$ 14,116	**1.70%**	1.71%	1.86%

(1) Starting in 2015, we have included cash collateral and margin deposits, and cash collateral received in Deposits with other banks and Other interest-bearing liabilities, respectively (previously, in Other assets and Other liabilities). Insurance segment assets and liabilities are included in Other assets and Other liabilities, respectively.
(2) Interest income includes loan fees of $573 million (2015 – $503 million; 2014 – $516 million).
(3) Amounts have been revised from those previously presented.
(4) Deposits include personal savings deposits with average balances of $166 billion (2015 – $142 billion; 2014 – $133 billion), interest expense of $.4 billion (2015 – $.6 billion; 2014 – $.7 billion) and average rates of .3% (2015 – .4%; 2014 – .5%). Deposits also include term deposits with average balances of $362 billion (2015 – $345 billion; 2014 – $302 billion), interest expense of $4.3 billion (2015 – $4.5 billion; 2014 – $4.4 billion) and average rates of 1.20% (2015 – 1.30%; 2014 – 1.47%).

Change in net interest income — Table 80

(Millions of Canadian dollars)	2016 (1) vs. 2015 Increase (decrease) due to changes in Average volume (2)	Average rate (2)	Net change	2015 vs. 2014 Increase (decrease) due to changes in Average volume (2)	Average rate (2)	Net change
Assets						
Deposits with other banks (3)						
Canada (4)	**$ 27**	**$ 17**	**$ 44**	$ 244	$ (235)	$ 9
U.S. (4)	**24**	**35**	**59**	9	2	11
Other international (4)	**–**	**(13)**	**(13)**	26	(45)	(19)
Securities						
Trading	**(245)**	**68**	**(177)**	323	(102)	221
Available-for-sale	**362**	**(111)**	**251**	153	152	305
Asset purchased under reverse repurchase agreements and securities borrowed	**194**	**371**	**565**	204	76	280
Loans						
Canada						
Retail (5)	**440**	**(1,141)**	**(701)**	458	(612)	(154)
Wholesale (5)	**506**	**(216)**	**290**	232	(243)	(11)
U.S.	**835**	**423**	**1,258**	256	(364)	(108)
Other international	**(77)**	**224**	**147**	278	(102)	176
Total interest income	**$ 2,066**	**$ (343)**	**$ 1,723**	$ 2,183	$ (1,473)	$ 710
Liabilities						
Deposits						
Canada	**309**	**(757)**	**(448)**	529	(783)	(254)
U.S.	**44**	**155**	**199**	58	(2)	56
Other international	**30**	**(37)**	**(7)**	43	5	48
Obligations related to securities sold short	**(190)**	**124**	**(66)**	186	(35)	151
Obligations related to assets sold under repurchase agreements and securities loaned	**103**	**189**	**292**	64	(5)	59
Subordinated debentures	**40**	**(53)**	**(13)**	38	(44)	(6)
Other interest-bearing liabilities (3)	**2**	**4**	**6**	637	(636)	1
Total interest expense	**$ 338**	**$ (375)**	**$ (37)**	$ 1,555	$ (1,500)	$ 55
Net interest income	**$ 1,728**	**$ 32**	**$ 1,760**	$ 628	$ 27	$ 655

(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) Starting in 2015, we have included cash collateral and margin deposits, and cash collateral received in Deposits with other banks and Other interest-bearing liabilities, respectively (previously, in Other assets and Other liabilities).
(4) Geographic classification for selected assets and liabilities is based on the domicile of the booking point of the subject assets and liabilities.
(5) Amounts have been revised from those previously presented.

Loans and acceptances by geography — Table 81

As at October 31 (Millions of Canadian dollars)	2016	2015	2014	2013	2012 (1)
Canada					
Residential mortgages	**$ 241,800**	$ 229,987	$ 215,624	$ 206,134	$ 195,552
Personal	**82,205**	84,637	86,984	86,102	80,000
Credit cards	**16,601**	15,516	14,650	13,902	13,422
Small business	**3,878**	4,003	4,067	4,026	2,503
Retail	**344,484**	334,143	321,325	310,164	291,477
Business	**76,266**	71,246	64,643	58,920	51,212
Sovereign (2)	**8,586**	8,508	3,840	3,807	3,751
Bank	**1,278**	530	413	823	390
Wholesale	**$ 86,130**	$ 80,284	$ 68,896	$ 63,550	$ 55,353
	$ 430,614	$ 414,427	$ 390,221	$ 373,714	$ 346,830
U.S.					
Retail	**17,134**	5,484	4,686	3,734	3,138
Wholesale	**59,349**	34,702	23,639	19,443	17,081
	76,483	40,186	28,325	23,177	20,219
Other International					
Retail	**7,852**	8,556	8,258	6,768	5,673
Wholesale	**21,733**	24,536	21,881	17,103	16,900
	29,585	33,092	30,139	23,871	22,573
Total loans and acceptances	**$ 536,682**	$ 487,705	$ 448,685	$ 420,762	$ 389,622
Total allowance for loan losses	**(2,235)**	(2,029)	(1,994)	(1,959)	(1,996)
Total loans and acceptances, net of allowance for loan losses	**$ 534,447**	$ 485,676	$ 446,691	$ 418,803	$ 387,626

(1) On a continuing operations basis.
(2) In 2015, we reclassified $4 billion from AFS securities to Loans.

Loans and acceptances by portfolio and sector — Table 82

As at October 31 (Millions of Canadian dollars)	2016	2015	2014	2013	2012 (1)
Residential mortgages	**$ 254,998**	$ 233,975	$ 219,257	$ 209,238	$ 198,324
Personal	**93,466**	94,346	96,021	93,260	85,800
Credit cards	**17,128**	15,859	14,924	14,142	13,661
Small business	**3,878**	4,003	4,067	4,026	2,503
Retail	**$ 369,470**	$ 348,183	$ 334,269	$ 320,666	$ 300,288
Business					
Agriculture	**6,515**	6,057	5,694	5,441	5,202
Automotive	**7,279**	6,614	6,209	6,167	3,585
Consumer goods	**10,052**	7,146	7,172	6,230	5,432
Energy					
Oil & gas	**6,259**	7,691	5,849	5,046	4,981
Utilities	**7,680**	5,162	3,766	3,860	3,821
Financial products	**8,840**	10,093	3,670	3,162	4,316
Forest products	**1,099**	1,169	979	893	811
Health services	**7,763**	6,023	4,052	3,786	3,766
Holding and investments	**7,195**	6,935	6,865	4,973	4,625
Industrial products	**5,508**	4,725	4,665	4,038	3,938
Mining & metals	**1,455**	1,402	1,320	1,074	965
Non-bank financial services	**8,408**	6,428	5,688	4,903	3,895
Other services	**11,582**	8,834	8,322	8,090	7,003
Real estate & related	**40,419**	33,802	30,387	24,413	20,650
Technology & media	**11,019**	6,599	4,822	4,006	4,203
Transportation & environment	**6,060**	5,907	5,432	5,593	5,221
Other	**7,568**	3,248	3,695	2,705	1,737
Sovereign	**10,581**	9,887	4,628	4,396	4,193
Bank	**1,930**	1,800	1,201	1,320	990
Wholesale	**$ 167,212**	$ 139,522	$ 114,416	$ 100,096	$ 89,334
Total loans and acceptances	**$ 536,682**	$ 487,705	$ 448,685	$ 420,762	$ 389,622
Total allowance for loan losses	**(2,235)**	(2,029)	(1,994)	(1,959)	(1,996)
Total loans and acceptances, net of allowance for loan losses	**$ 534,447**	$ 485,676	$ 446,691	$ 418,803	$ 387,626

(1) On a continuing operations basis.

Impaired loans by portfolio and geography — Table 83

As at October 31 (Millions of Canadian dollars, except for percentage amounts)	2016	2015	2014	2013	2012 (1)
Residential mortgages	$ 709	$ 646	$ 678	$ 691	$ 674
Personal	304	299	300	363	273
Small business	46	45	47	37	33
Retail	1,059	990	1,025	1,091	980
Business					
Agriculture	$ 43	$ 41	$ 40	$ 43	$ 52
Automotive	43	11	12	12	17
Consumer goods	165	130	108	101	83
Energy					
Oil and gas	1,264	156	6	14	2
Utilities	78	57	–	–	–
Financing products	111	109	–	39	50
Forest products	21	28	25	26	30
Health services	21	17	18	25	17
Holding and investments	72	185	132	40	38
Industrial products	43	45	48	54	88
Mining & metals	15	17	9	2	2
Non-bank financial services	3	1	3	1	5
Other services	109	69	99	101	97
Real estate & related	241	297	314	367	353
Technology & media	93	34	38	117	251
Transportation & environment	45	53	32	98	73
Other	57	43	66	67	110
Sovereign	–	–	–	–	–
Bank	2	2	2	3	2
Wholesale	2,426	1,295	952	1,110	1,270
Acquired credit-impaired loans	418	–	–		
Total impaired loans (2)	$ 3,903	$ 2,285	$ 1,977	$ 2,201	$ 2,250
Canada					
Residential mortgages	$ 368	$ 356	$ 388	$ 464	$ 475
Personal	228	223	224	229	206
Small business	46	45	47	36	34
Retail	642	624	659	729	715
Business					
Agriculture	34	39	36	38	44
Automotive	9	8	11	9	11
Consumer goods	91	65	70	58	34
Energy					
Oil & gas	57	39	4	14	–
Utilities	15	20	–	–	–
Financing products	–	–	–	–	–
Forest products	21	5	6	8	12
Health services	18	17	19	15	15
Holding and investments	5	3	3	3	22
Industrial products	39	39	41	40	34
Mining & metals	12	7	9	2	2
Non-bank financial services	–	–	1	1	3
Other services	49	51	67	59	50
Real estate & related	121	161	171	169	153
Technology & media	27	34	37	86	238
Transportation & environment	24	29	11	21	22
Other	–	(5)	1	3	1
Sovereign	–	–	–	–	–
Bank	–	–	–	–	–
Wholesale	522	512	487	526	641
Total	$ 1,164	$ 1,136	$ 1,146	$ 1,255	$ 1,356
U.S.					
Retail	$ 56	$ 10	$ 13	$ 14	$ 7
Wholesale	1,736	204	18	98	162
Total	$ 1,792	$ 214	$ 31	$ 112	$ 169
Other International					
Retail	$ 380	$ 356	$ 353	$ 348	$ 258
Wholesale	567	579	447	486	467
Total	$ 947	$ 935	$ 800	$ 834	$ 725
Total impaired loans	$ 3,903	$ 2,285	$ 1,977	$ 2,201	$ 2,250
Allowance for impaired loans	(809)	(654)	(632)	(599)	(636)
Net impaired loans	$ 3,094	$ 1,631	$ 1,345	$ 1,602	$ 1,614
Gross impaired loans as a % of loans and acceptances					
Residential mortgages	0.28%	0.28%	0.31%	0.33%	0.34%
Personal	0.33%	0.32%	0.31%	0.39%	0.32%
Small business	1.19%	1.13%	1.16%	0.83%	1.32%
Retail	0.29%	0.28%	0.31%	0.34%	0.33%
Wholesale	1.69%	0.93%	0.84%	1.11%	1.42%
Total	0.73%	0.47%	0.44%	0.52%	0.58%
Allowance for impaired loans as a % of gross impaired loans	20.72%	28.64%	31.98%	27.22%	28.33%

(1) On a continuing operations basis.
(2) Past due loans greater than 90 days not included in impaired loans were $337 million in 2016 (2015 – $314 million; 2014 – $316 million; 2013 – $346 million; 2012 – $393 million).

Provision for credit losses by portfolio and geography — Table 84

(Millions of Canadian dollars, except for percentage amounts)	2016	2015	2014	2013	2012 (1)
Residential mortgages	$ 77	$ 47	$ 94	$ 41	$ 67
Personal	458	388	441	458	445
Credit cards	442	378	353	354	394
Small business	34	32	44	32	43
Retail	$ 1,011	$ 845	$ 932	$ 885	$ 949
Business					
Agriculture	$ 10	$ 9	$ 3	$ 4	$ 8
Automotive	13	3	2	3	(2)
Consumer goods	20	33	27	17	27
Energy					
Oil and gas	320	47	(5)	(6)	(11)
Utilities	16	9	32	–	
Financial products	1	39	3	1	2
Forest products	4	6	7	4	5
Health services	4	–	–	–	–
Holding and investments	–	18	29	(6)	(1)
Industrial products	12	4	14	21	32
Mining & metals	7	8	2	1	–
Non-bank financial services	–	7	–	10	1
Other services	(5)	4	18	14	(3)
Real estate & related	36	29	58	62	82
Technology & media	8	5	14	157	102
Transportation & environment	(4)	8	2	35	47
Other	36	24	26	35	63
Sovereign	–	–	–	–	–
Bank	(3)	(1)	–	–	–
Wholesale	$ 475	$ 252	$ 232	$ 352	$ 352
Acquired credit-impaired loans	10	–	–	–	–
Total provision for credit losses on impaired loans	$ 1,496	$ 1,097	$ 1,164	$ 1,237	$ 1,301
Canada					
Residential mortgages	$ 42	$ 27	$ 27	$ 27	$ 34
Personal	459	393	393	391	413
Credit cards	435	371	345	346	391
Small business	34	32	44	32	43
Retail	$ 970	$ 823	$ 809	$ 796	$ 881
Business					
Agriculture	10	9	4	4	8
Automotive	3	3	3	3	(2)
Consumer goods	19	21	25	16	13
Energy					
Oil & gas	99	22	(5)	(6)	(11)
Utilities	–	1	–	–	–
Financing products	–	–	–	–	–
Forest products	5	1	1	3	5
Health services	4	–	–	–	–
Holding and investments	–	–	–	(8)	–
Industrial products	10	7	14	14	12
Mining & metals	7	3	2	1	–
Non-bank financial services	–	–	–	–	1
Other services	14	–	6	3	–
Real estate & related	26	13	34	37	43
Technology & media	2	6	14	50	98
Transportation & environment	8	7	3	2	10
Other	6	23	22	30	30
Sovereign	–	–	–	–	–
Bank	–	–	–	–	–
Wholesale	$ 213	$ 116	$ 123	$ 149	$ 207
Total	$ 1,183	$ 939	$ 932	$ 945	$ 1,088
U.S.					
Retail	1	1	2	3	4
Wholesale	227	40	40	32	29
	$ 228	$ 41	$ 42	$ 35	$ 33
Other International					
Retail	41	21	121	86	64
Wholesale	44	96	69	171	116
	$ 85	$ 117	$ 190	$ 257	$ 180
Total provision for credit losses on impaired loans	$ 1,496	$ 1,097	$ 1,164	$ 1,237	$ 1,301
Total provision for credit losses on non-impaired loans	50	–	–	–	(2)
Total provision for credit losses	$ 1,546	$ 1,097	$ 1,164	$ 1,237	$ 1,299
Total PCL as a % of average net loans and acceptances	0.29%	0.24%	0.27%	0.31%	0.35%
PCL on impaired loans as a % of average net loans and acceptances	0.28%	0.24%	0.27%	0.31%	0.35%

(1) On a continuing operations basis.

Allowance for credit losses by portfolio and geography					Table 85
(Millions of Canadian dollars, except percentage amounts)	**2016**	2015	2014	2013	2012 (1), (2)
Allowance at beginning of year	**$ 2,120**	$ 2,085	$ 2,050	$ 2,087	$ 2,056
Provision for credit losses	**1,546**	1,097	1,164	1,237	1,299
Write-offs by portfolio					
Residential mortgages	**(42)**	(64)	(30)	(24)	(32)
Personal	**(556)**	(494)	(565)	(498)	(499)
Credit cards	**(564)**	(497)	(466)	(466)	(496)
Small business	**(40)**	(40)	(47)	(35)	(50)
Retail	**$ (1,202)**	$ (1,095)	$ (1,108)	$ (1,023)	$ (1,077)
Business	**$ (321)**	$ (243)	$ (221)	$ (448)	$ (288)
Sovereign	**–**	–	–	–	–
Bank	**–**	–	–	–	(32)
Wholesale	**$ (321)**	$ (243)	$ (221)	$ (448)	$ (320)
Total write-offs by portfolio	**$ (1,523)**	$ (1,338)	$ (1,329)	$ (1,471)	$ (1,397)
Recoveries by portfolio					
Residential mortgages	**$ 5**	$ 7	$ 2	$ 2	$ 1
Personal	**111**	105	106	96	83
Credit cards	**122**	119	114	112	102
Small business	**10**	10	9	9	8
Retail	**$ 248**	$ 241	$ 231	$ 219	$ 194
Business	**$ 38**	$ 33	$ 32	$ 51	$ 39
Sovereign	**–**	–	–	–	–
Bank	**–**	1	–	–	–
Wholesale	**$ 38**	$ 34	$ 32	$ 51	$ 39
Total recoveries by portfolio	**$ 286**	$ 275	$ 263	$ 270	$ 233
Net write-offs	**$ (1,237)**	$ (1,063)	$ (1,066)	$ (1,201)	$ (1,164)
Adjustments (3)	**(103)**	1	(63)	(73)	(104)
Total allowance for credit losses at end of year	**$ 2,326**	$ 2,120	$ 2,085	$ 2,050	$ 2,087
Allowance against impaired loans					
Canada					
Residential mortgages	**$ 35**	$ 27	$ 31	$ 36	$ 41
Personal	**105**	96	93	97	89
Small business	**20**	19	19	16	12
Retail	**$ 160**	$ 142	$ 143	$ 149	$ 142
Business					
Agriculture	**$ 6**	$ 5	$ 6	$ 6	$ 9
Automotive	**4**	4	4	4	7
Consumer goods	**14**	12	22	15	14
Energy					
Oil & gas	**6**	–	–	1	1
Utilities	**–**	1	–	–	–
Financing products	**–**	–	–	–	–
Forest products	**5**	3	3	4	6
Health services	**6**	6	6	6	6
Holding and investments	**1**	1	1	2	10
Industrial products	**11**	13	18	15	10
Mining and metals	**4**	1	1	1	1
Non-bank financial services	**–**	–	–	–	–
Other services	**18**	19	28	23	20
Real estate & related	**23**	28	48	42	45
Technology & media	**10**	12	17	46	107
Transportation & environment	**11**	7	5	6	8
Other	**–**	(1)	1	(1)	(5)
Sovereign	**–**	–	–	–	–
Bank	**–**	–	–	–	–
Wholesale	**$ 119**	$ 111	$ 160	$ 170	$ 239
	$ 279	$ 253	$ 303	$ 319	$ 381
U.S.					
Retail	**$ 2**	$ 1	$ 1	$ 2	$ 1
Wholesale	**177**	47	16	19	38
	$ 179	$ 48	$ 17	$ 21	$ 39
Other International					
Retail	**$ 180**	$ 169	$ 172	$ 146	$ 96
Wholesale	**171**	184	140	113	120
	$ 351	$ 353	$ 312	$ 259	$ 216
Total allowance against impaired loans	**$ 809**	$ 654	$ 632	$ 599	$ 636
Allowance against non-impaired loans					
Residential mortgages	**$ 96**	$ 83	$ 78	$ 48	$ 48
Personal	**385**	396	400	405	392
Credit cards	**386**	386	385	385	403
Small business	**45**	45	45	45	60
Retail	**$ 912**	$ 910	$ 908	$ 883	$ 903
Wholesale	**$ 514**	$ 465	$ 454	$ 477	$ 457
Off-balance sheet and other items	**$ 91**	$ 91	$ 91	$ 91	$ 91
Total allowance against non-impaired loans	**$ 1,517**	$ 1,466	$ 1,453	$ 1,451	$ 1,451
Total allowance for credit losses	**$ 2,326**	$ 2,120	$ 2,085	$ 2,050	$ 2,087
Key ratios					
Allowance for credit losses as a % of loans and acceptances	**0.43%**	0.43%	0.46%	0.49%	0.54%
Net write-offs as a % of average net loans and acceptances	**0.23%**	0.23%	0.25%	0.30%	0.31%

(1) On a continuing operations basis.
(2) Opening allowance for credit losses as at November 1, 2011 has been restated due to the implementation of amendments to IFRS 11.
(3) Under IFRS, other adjustments include $100 million of unwind of discount and $3 million of changes in exchange rate (2015 – $80 million and $(81) million; 2014 – $87 million and $(24) million; 2013 – $86 million and $(13) million). For further details, refer to Note 5 of our audited 2016 Annual Consolidated Financial Statements.

Credit quality information by Canadian province — **Table 86**

(Millions of Canadian dollars)	**2016**	2015	2014	2013	2012 (1)
Loans and acceptances					
Atlantic provinces (2)	**$ 23,947**	$ 23,040	$ 22,130	$ 21,263	$ 19,953
Quebec	**53,518**	51,197	50,748	48,060	42,920
Ontario	**185,434**	175,315	159,817	152,258	141,566
Alberta	**66,277**	28,607	61,197	58,318	53,987
Other Prairie provinces (3)	**30,143**	65,785	27,341	25,697	23,200
B.C. and territories (4)	**71,295**	70,483	68,988	68,118	65,204
Total loans and acceptances in Canada	**$ 430,614**	$ 414,427	$ 390,221	$ 373,714	$ 346,830
Gross impaired loans					
Atlantic provinces (2)	**$ 101**	$ 93	$ 81	$ 83	$ 67
Quebec	**207**	213	205	177	180
Ontario	**336**	341	391	424	502
Alberta	**313**	224	185	233	250
Other Prairie provinces (3)	**93**	115	73	97	88
B.C. and territories (4)	**114**	150	211	241	269
Total gross impaired loans in Canada	**$ 1,164**	$ 1,136	$ 1,146	$ 1,255	$ 1,356
Provision for credit losses on impaired loans					
Atlantic provinces (2)	**$ 67**	$ 57	$ 51	$ 50	$ 62
Quebec	**92**	96	92	78	96
Ontario	**654**	590	588	605	704
Alberta	**226**	77	71	74	79
Other Prairie provinces (3)	**64**	52	40	39	41
B.C. and territories (4)	**80**	67	90	99	106
Total provision for credit losses on impaired loans in Canada	**$ 1,183**	$ 939	$ 932	$ 945	$ 1,088

(1) On a continuing operations basis.
(2) Comprises Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick.
(3) Comprises Manitoba and Saskatchewan.
(4) Comprises British Columbia, Nunavut, Northwest Territories and Yukon.

EDTF recommendations index

On October 29, 2012, the Enhanced Disclosure Task Force (EDTF), established by the Financial Stability Board, issued its report Enhancing the Risk Disclosures of Banks, which included 32 recommendations aimed at achieving transparent, high-quality risk disclosures. As a result, our enhanced disclosures have been provided in our 2016 Annual Report and Supplementary Financial Information package (SFI).

The following index summarizes our disclosure by EDTF recommendation:

			Location of disclosure	
Type of Risk	**Recommendation**	**Disclosure**	**Annual Report page**	**SFI page**
General	1	Table of contents for EDTF risk disclosure	115	1
	2	Define risk terminology and measures	49-54, 208-210	–
	3	Top and emerging risks	47-49	–
	4	New regulatory ratios	90-93	–
Risk governance, risk management and business model	5	Risk management organization	49-54	–
	6	Risk culture	49-51	–
	7	Risk in the context of our business activities	98	–
	8	Stress testing	51-52, 67	–
Capital adequacy and risk-weighted assets (RWA)	9	Minimum Basel III capital ratios and Domestic systemically important bank surcharge	90-93	–
	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	89-93	–
	13	RWA by business segments	–	28
	14	Analysis of capital requirement, and related measurement model information	54-58	26-27
	15	RWA credit risk and related risk measurements	–	42-44
	16	Movement of risk-weighted assets by risk type	–	28
	17	Basel back-testing	52, 56	42
Liquidity	18	Quantitative and qualitative analysis of our liquidity reserve	73-75, 78-79	–
Funding	19	Encumbered and unencumbered assets by balance sheet category, and contractual obligations for rating downgrades	75, 78	–
	20	Maturity analysis of consolidated total assets, liabilities and off-balance sheet commitments analyzed by remaining contractual maturity at the balance sheet date	80-81	–
	21	Sources of funding and funding strategy	75-77	–
Market risk	22	Relationship between the market risk measures for trading and non-trading portfolios and the balance sheet	71-72	–
	23	Decomposition of market risk factors	66-70	–
	24	Market risk validation and back-testing	67	–
	25	Primary risk management techniques beyond reported risk measures and parameters	66-71	–
Credit risk	26	Bank's credit risk profile	54-66, 156-158	31-44
		Quantitative summary of aggregate credit risk exposures that reconciles to the balance sheet	110-114	40
	27	Policies for identifying impaired loans	57-58, 101 131-132	–
	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	60	46
	30	Credit risk mitigation, including collateral held for all sources of credit risk	57	41
Other	31	Other risk types	82-89	–
	32	Publicly known risk events	85-87, 195-196	–

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Management's Responsibility for Financial Reporting

The accompanying consolidated financial statements of Royal Bank of Canada were prepared by management, which is responsible for the integrity and fairness of the information presented, including the many amounts that must of necessity be based on estimates and judgments. These consolidated financial statements were prepared in accordance with the Bank Act (Canada) and International Financial Reporting Standards as issued by the International Accounting Standards Board. Financial information appearing throughout our Management's Discussion and Analysis is consistent with these consolidated financial statements.

Our internal controls are designed to provide reasonable assurance that transactions are authorized, assets are safeguarded and proper records are maintained. These controls include quality standards in hiring and training of employees, policies and procedures manuals, a corporate code of conduct and accountability for performance within appropriate and well-defined areas of responsibility.

The system of internal controls is further supported by a compliance function, which is designed to ensure that we and our employees comply with securities legislation and conflict of interest rules, and by an internal audit staff, which conducts periodic audits of all aspects of our operations.

The Board of Directors oversees management's responsibilities for financial reporting through an Audit Committee, which is composed entirely of independent directors. This Committee reviews our consolidated financial statements and recommends them to the Board for approval. Other key responsibilities of the Audit Committee include reviewing our existing internal control procedures and planned revisions to those procedures, and advising the directors on auditing matters and financial reporting issues. Our Chief Compliance Officer and Chief Internal Auditor have full and unrestricted access to the Audit Committee.

The Office of the Superintendent of Financial Institutions Canada (OSFI) examines and inquires into our business and affairs as deemed necessary to determine whether the provisions of the *Bank Act* are being complied with, and that we are in sound financial condition. In carrying out its mandate, OSFI strives to protect the rights and interests of our depositors and creditors.

PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm appointed by our shareholders upon the recommendation of the Audit Committee and Board, has performed an independent audit of the consolidated balance sheet as at October 31, 2016 and the related consolidated statements of income, comprehensive income, changes in equity and cash flows for the year ended October 31, 2016 and the effectiveness of our internal control over financial reporting as at October 31, 2016. Their report, which expressed an unqualified opinion, can be found on the following pages of the consolidated financial statements. PricewaterhouseCoopers LLP has full and unrestricted access to the Audit Committee to discuss their audit and related findings. The consolidated balance sheet as at October 31, 2015, and the consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the years in the two-year period ended October 31, 2015 were audited by our previous auditors, Deloitte LLP, who expressed an unqualified opinion on those statements in their report dated December 1, 2015.

David I. McKay
President and Chief Executive Officer

Janice R. Fukakusa
Chief Administrative Officer and Chief Financial Officer

Toronto, November 29, 2016

Management's Report on Internal Control over Financial Reporting

Management of Royal Bank of Canada is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, the President and Chief Executive Officer and the Chief Administrative Officer and Chief Financial Officer and effected by the Board of Directors, management and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. It includes those policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions related to and dispositions of our assets;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and our receipts and expenditures are made only in accordance with authorizations of our management and directors; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on our financial statements.

Due to its inherent limitations, internal control over financial reporting may not prevent or detect misstatements on a timely basis. Also, projections of any evaluation of the effectiveness of internal control over financial reporting to future periods are subject to the risk that the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management evaluated, under the supervision of and with the participation of the President and Chief Executive Officer and the Chief Administrative Officer and Chief Financial Officer, the effectiveness of our internal control over financial reporting as of October 31, 2016, based on the criteria set forth in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on that evaluation, management concluded that, as of October 31, 2016, internal control over financial reporting was effective based on the criteria established in the *Internal Control—Integrated Framework (2013)*. Also, based on the results of our evaluation, management concluded that there were no material weaknesses that have been identified in internal control over financial reporting as of October 31, 2016.

The effectiveness of our internal control over financial reporting as of October 31, 2016, has been audited by PricewaterhouseCoopers LLP, Independent Registered Public Accounting Firm, as stated in their report, which expressed an unqualified opinion on our internal control over financial reporting and appears herein.

David I. McKay
President and Chief Executive Officer

Janice R. Fukakusa
Chief Administrative Officer and Chief Financial Officer

Toronto, November 29, 2016

Reports of Independent Registered Public Accounting Firms

Independent Auditor's Report – Current Auditor

To the Shareholders of Royal Bank of Canada

We have completed an integrated audit of Royal Bank of Canada's (the Bank) 2016 consolidated financial statements and its internal control over financial reporting as at October 31, 2016. Our opinions, based on our audits, are presented below.

Report on the consolidated financial statements
We have audited the accompanying 2016 consolidated financial statements of Royal Bank of Canada, which comprise the consolidated balance sheet as at October 31, 2016, and the consolidated statements of income, comprehensive income, changes in equity, and cash flows for the year ended October 31, 2016 and the related notes, which comprise a summary of significant accounting policies and other explanatory information.

Management's responsibility for the consolidated financial statements
Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's responsibility
Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit as at October 31, 2016 and for the year then ended in accordance with Canadian generally accepted auditing standards and the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement. Canadian generally accepted auditing standards also require that we comply with ethical requirements.

An audit involves performing procedures to obtain audit evidence, on a test basis, about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Bank's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting principles and policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained in our audit is sufficient and appropriate to provide a basis for our audit opinion on the consolidated financial statements.

Opinion
In our opinion, the 2016 consolidated financial statements present fairly, in all material respects, the financial position of Royal Bank of Canada as at October 31, 2016 and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Report on internal control over financial reporting
We have also audited Royal Bank of Canada's internal control over financial reporting as at October 31, 2016, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

Management's responsibility for internal control over financial reporting
Management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting.

Auditor's responsibility
Our responsibility is to express an opinion on the Bank's internal control over financial reporting based on our audit. We conducted our audit of internal control over financial reporting in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

An audit of internal control over financial reporting includes obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we consider necessary in the circumstances.

We believe that our audit provides a reasonable basis for our audit opinion on the company's internal control over financial reporting.

Definition of internal control over financial reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Inherent limitations
Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Opinion
In our opinion, Royal Bank of Canada maintained, in all material respects, effective internal control over financial reporting as at October 31, 2016, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by COSO.

PricewaterhouseCoopers LLP
Chartered Professional Accountants
Licensed Public Accountants
Toronto, Canada
November 29, 2016

Independent Auditor's Report – Predecessor Auditor

To the Shareholders of Royal Bank of Canada

We have audited the accompanying consolidated financial statements of Royal Bank of Canada and subsidiaries (the "Bank"), which comprise the consolidated balance sheet as at October 31, 2015, and the consolidated statements of income, statements of comprehensive income, statements of changes in equity, and statements of cash flows for each of the years in the two-year period ended October 31, 2015, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements
Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility
Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Canadian generally accepted auditing standards and the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained in our audits is sufficient and appropriate to provide a basis for our audit opinion.

Opinion
In our opinion, the consolidated financial statements present fairly, in all material respects, the balance sheet of Royal Bank of Canada and subsidiaries as at October 31, 2015, and their financial performance and cash flows for each of the years in the two-year period ended October 31, 2015 in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Deloitte LLP
Chartered Professional Accountants
Licensed Public Accountants
Toronto, Canada
December 1, 2015

Consolidated Balance Sheets

(Millions of Canadian dollars)	As at October 31 2016	October 31 2015
Assets		
Cash and due from banks	**$ 14,929**	$ 12,452
Interest-bearing deposits with banks	**27,851**	22,690
Securities (Note 4)		
Trading	**151,292**	158,703
Available-for-sale	**84,801**	56,805
	236,093	215,508
Assets purchased under reverse repurchase agreements and securities borrowed	**186,302**	174,723
Loans (Note 5)		
Retail	**369,470**	348,183
Wholesale	**154,369**	126,069
	523,839	474,252
Allowance for loan losses (Note 5)	**(2,235)**	(2,029)
	521,604	472,223
Segregated fund net assets (Note 16)	**981**	830
Other		
Customers' liability under acceptances	**12,843**	13,453
Derivatives (Note 8)	**118,944**	105,626
Premises and equipment, net (Note 9)	**2,836**	2,728
Goodwill (Note 10)	**11,156**	9,289
Other intangibles (Note 10)	**4,648**	2,814
Other assets (Note 13)	**42,071**	41,872
	192,498	175,782
Total assets	**$ 1,180,258**	$ 1,074,208
Liabilities and equity		
Deposits (Note 14)		
Personal	**$ 250,550**	$ 220,566
Business and government	**488,007**	455,578
Bank	**19,032**	21,083
	757,589	697,227
Segregated fund net liabilities (Note 16)	**981**	830
Other		
Acceptances	**12,843**	13,453
Obligations related to securities sold short	**50,369**	47,658
Obligations related to assets sold under repurchase agreements and securities loaned	**103,441**	83,288
Derivatives (Note 8)	**116,550**	107,860
Insurance claims and policy benefit liabilities (Note 15)	**9,164**	9,110
Other liabilities (Note 18)	**47,947**	43,476
	340,314	304,845
Subordinated debentures (Note 19)	**9,762**	7,362
Total liabilities	**1,108,646**	1,010,264
Equity attributable to shareholders (Note 21)		
Preferred shares	**6,713**	5,098
Common shares (shares issued – 1,484,234,375 and 1,443,954,789)	**17,859**	14,611
Retained earnings	**41,519**	37,811
Other components of equity	**4,926**	4,626
	71,017	62,146
Non-controlling interests (Note 21)	**595**	1,798
Total equity	**71,612**	63,944
Total liabilities and equity	**$ 1,180,258**	$ 1,074,208

The accompanying notes are an integral part of these Consolidated Financial Statements.

David I. McKay
President and Chief Executive Officer

David F. Denison
Director

Consolidated Statements of Income

(Millions of Canadian dollars, except per share amounts)	For the year ended October 31 2016	October 31 2015	October 31 2014
Interest income			
Loans	**$ 17,876**	$ 16,882	$ 16,979
Securities	**4,593**	4,519	3,993
Assets purchased under reverse repurchase agreements and securities borrowed	**1,816**	1,251	971
Deposits and other	**167**	77	76
	24,452	22,729	22,019
Interest expense			
Deposits and other	**5,467**	5,723	5,873
Other liabilities	**2,227**	1,995	1,784
Subordinated debentures	**227**	240	246
	7,921	7,958	7,903
Net interest income	**16,531**	14,771	14,116
Non-interest income			
Insurance premiums, investment and fee income (Note 15)	**4,868**	4,436	4,957
Trading revenue	**701**	552	742
Investment management and custodial fees	**4,240**	3,778	3,355
Mutual fund revenue	**2,887**	2,881	2,621
Securities brokerage commissions	**1,429**	1,436	1,379
Service charges	**1,756**	1,592	1,494
Underwriting and other advisory fees	**1,876**	1,885	1,809
Foreign exchange revenue, other than trading	**964**	814	827
Card service revenue	**889**	798	689
Credit fees	**1,239**	1,184	1,080
Net gains on available-for-sale securities (Note 4)	**76**	145	192
Share of profit in joint ventures and associates (Note 12)	**176**	149	162
Other	**773**	900	685
	21,874	20,550	19,992
Total revenue	**38,405**	35,321	34,108
Provision for credit losses (Note 5)	**1,546**	1,097	1,164
Insurance policyholder benefits, claims and acquisition expense (Note 15)	**3,424**	2,963	3,573
Non-interest expense			
Human resources (Note 17 and 22)	**12,201**	11,583	11,031
Equipment	**1,438**	1,277	1,147
Occupancy	**1,568**	1,410	1,330
Communications	**945**	888	847
Professional fees	**1,078**	932	763
Amortization of other intangibles (Note 10)	**970**	712	666
Other	**1,936**	1,836	1,877
	20,136	18,638	17,661
Income before income taxes	**13,299**	12,623	11,710
Income taxes (Note 24)	**2,841**	2,597	2,706
Net income	**$ 10,458**	$ 10,026	$ 9,004
Net income attributable to:			
Shareholders	**$ 10,405**	$ 9,925	$ 8,910
Non-controlling interests	**53**	101	94
	$ 10,458	$ 10,026	$ 9,004
Basic earnings per share (in dollars) (Note 25)	**$ 6.80**	$ 6.75	$ 6.03
Diluted earnings per share (in dollars) (Note 25)	**6.78**	6.73	6.00
Dividends per common share (in dollars)	**3.24**	3.08	2.84

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Comprehensive Income

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Net income	**$ 10,458**	$ 10,026	$ 9,004
Other comprehensive income (loss), net of taxes (Note 24)			
Items that will be reclassified subsequently to income:			
Net change in unrealized gains (losses) on available-for-sale securities			
Net unrealized gains (losses) on available-for-sale securities	**73**	(76)	143
Reclassification of net losses (gains) on available-for-sale securities to income	**(48)**	(41)	(58)
	25	(117)	85
Foreign currency translation adjustments			
Unrealized foreign currency translation gains (losses)	**147**	5,885	2,743
Net foreign currency translation gains (losses) from hedging activities	**113**	(3,223)	(1,585)
Reclassification of losses (gains) on foreign currency translation to income	**–**	(224)	44
Reclassification of losses (gains) on net investment hedging activities to income	**–**	111	3
	260	2,549	1,205
Net change in cash flow hedges			
Net gains (losses) on derivatives designated as cash flow hedges	**(35)**	(541)	(108)
Reclassification of losses (gains) on derivatives designated as cash flow hedges to income	**52**	330	28
	17	(211)	(80)
Items that will not be reclassified subsequently to income:			
Remeasurements of employee benefit plans (Note 17)	**(1,077)**	582	(236)
Net fair value change due to credit risk on financial liabilities designated as at fair value through profit or loss	**(322)**	350	(59)
	(1,399)	932	(295)
Total other comprehensive income (loss), net of taxes	**(1,097)**	3,153	915
Total comprehensive income	**$ 9,361**	$ 13,179	$ 9,919
Total comprehensive income attributable to:			
Shareholders	**$ 9,306**	$ 13,065	$ 9,825
Non-controlling interests	**55**	114	94
	$ 9,361	$ 13,179	$ 9,919

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Changes in Equity

(Millions of Canadian dollars)	Preferred shares	Common shares	Treasury shares – preferred	Treasury shares – common	Retained earnings	Other components of equity: Available-for-sale securities	Other components of equity: Foreign currency translation	Other components of equity: Cash flow hedges	Other components of equity: Total other components of equity	Equity attributable to shareholders	Non-controlling interests	Total equity
Balance at November 1, 2013	$ 4,600	$ 14,377	$ 1	$ 41	$ 27,438	$ 347	$ 686	$ 175	$ 1,208	$ 47,665	$ 1,795	$49,460
Changes in equity												
Issues of share capital	1,000	150	–	–	(14)	–	–	–	–	1,136	–	1,136
Common shares purchased for cancellation	–	(16)	–	–	(97)	–	–	–	–	(113)	–	(113)
Preferred shares redeemed	(1,525)	–	–	–	–	–	–	–	–	(1,525)	–	(1,525)
Sales of treasury shares	–	–	124	5,333	–	–	–	–	–	5,457	–	5,457
Purchases of treasury shares	–	–	(125)	(5,303)	–	–	–	–	–	(5,428)	–	(5,428)
Share-based compensation awards	–	–	–	–	(9)	–	–	–	–	(9)	–	(9)
Dividends on common shares	–	–	–	–	(4,097)	–	–	–	–	(4,097)	–	(4,097)
Dividends on preferred shares and other	–	–	–	–	(213)	–	–	–	–	(213)	(94)	(307)
Other	–	–	–	–	(8)	–	–	–	–	(8)	18	10
Net income	–	–	–	–	8,910	–	–	–	–	8,910	94	9,004
Total other comprehensive income (loss), net of taxes	–	–	–	–	(295)	85	1,205	(80)	1,210	915	–	915
Balance at October 31, 2014	$ 4,075	$ 14,511	$ –	$ 71	$ 31,615	$ 432	$ 1,891	$ 95	$ 2,418	$ 52,690	$ 1,813	$54,503
Changes in equity												
Issues of share capital	1,350	62	–	–	(21)	–	–	–	–	1,391	–	1,391
Preferred shares redeemed	(325)	–	–	–	–	–	–	–	–	(325)	–	(325)
Sales of treasury shares	–	–	117	6,098	–	–	–	–	–	6,215	–	6,215
Purchases of treasury shares	–	–	(119)	(6,131)	–	–	–	–	–	(6,250)	–	(6,250)
Share-based compensation awards	–	–	–	–	(1)	–	–	–	–	(1)	–	(1)
Dividends on common shares	–	–	–	–	(4,443)	–	–	–	–	(4,443)	–	(4,443)
Dividends on preferred shares and other	–	–	–	–	(191)	–	–	–	–	(191)	(92)	(283)
Other	–	–	–	–	(5)	–	–	–	–	(5)	(37)	(42)
Net income	–	–	–	–	9,925	–	–	–	–	9,925	101	10,026
Total other comprehensive income (loss), net of taxes	–	–	–	–	932	(117)	2,536	(211)	2,208	3,140	13	3,153
Balance at October 31, 2015	$ 5,100	$ 14,573	$ (2)	$ 38	$ 37,811	$ 315	$ 4,427	$ (116)	$ 4,626	$ 62,146	$ 1,798	$63,944
Changes in equity												
Issues of share capital	**1,855**	**3,422**	**–**	**–**	**(16)**	**–**	**–**	**–**	**–**	**5,261**	**–**	**5,261**
Common shares purchased for cancellation	**–**	**(56)**	**–**	**–**	**(306)**	**–**	**–**	**–**	**–**	**(362)**	**–**	**(362)**
Preferred shares purchased for cancellation	**(242)**	**–**	**–**	**–**	**(22)**	**–**	**–**	**–**	**–**	**(264)**	**–**	**(264)**
Redemption of trust capital securities	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**(1,200)**	**(1,200)**
Sales of treasury shares	**–**	**–**	**172**	**4,973**	**–**	**–**	**–**	**–**	**–**	**5,145**	**–**	**5,145**
Purchases of treasury shares	**–**	**–**	**(170)**	**(5,091)**	**–**	**–**	**–**	**–**	**–**	**(5,261)**	**–**	**(5,261)**
Share-based compensation awards	**–**	**–**	**–**	**–**	**(54)**	**–**	**–**	**–**	**–**	**(54)**	**–**	**(54)**
Dividends on common shares	**–**	**–**	**–**	**–**	**(4,817)**	**–**	**–**	**–**	**–**	**(4,817)**	**–**	**(4,817)**
Dividends on preferred shares and other	**–**	**–**	**–**	**–**	**(294)**	**–**	**–**	**–**	**–**	**(294)**	**(63)**	**(357)**
Other	**–**	**–**	**–**	**–**	**211**	**–**	**–**	**–**	**–**	**211**	**5**	**216**
Net income	**–**	**–**	**–**	**–**	**10,405**	**–**	**–**	**–**	**–**	**10,405**	**53**	**10,458**
Total other comprehensive income (loss), net of taxes	**–**	**–**	**–**	**–**	**(1,399)**	**25**	**258**	**17**	**300**	**(1,099)**	**2**	**(1,097)**
Balance at October 31, 2016	**$ 6,713**	**$ 17,939**	**$ –**	**$ (80)**	**$ 41,519**	**$ 340**	**$ 4,685**	**$ (99)**	**$ 4,926**	**$ 71,017**	**$ 595**	**$71,612**

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Cash Flows

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Cash flows from operating activities			
Net income	**$ 10,458**	$ 10,026	$ 9,004
Adjustments for non-cash items and others			
Provision for credit losses	**1,546**	1,097	1,164
Depreciation	**573**	527	499
Deferred income taxes	**(479)**	302	(207)
Amortization and impairment of other intangibles	**973**	719	674
Net changes in investments in joint ventures and associates	**(184)**	(146)	(224)
Losses (Gains) on sale of premises and equipment	**19**	(32)	14
Losses (Gains) on available-for-sale securities	**(176)**	(220)	(228)
Losses (Gains) on disposition of business	**(268)**	(77)	95
Impairment of available-for-sale securities	**90**	59	25
Adjustments for net changes in operating assets and liabilities			
Insurance claims and policy benefit liabilities	**1,040**	546	530
Net change in accrued interest receivable and payable	**(67)**	(279)	187
Current income taxes	**1,189**	(905)	(206)
Derivative assets	**(13,224)**	(18,228)	(12,580)
Derivative liabilities	**8,593**	18,893	12,237
Trading securities	**6,827**	(7,401)	(7,253)
Loans, net of securitizations	**(19,297)**	(34,964)	(27,096)
Assets purchased under reverse repurchase agreements and securities borrowed	**(11,369)**	(39,143)	(18,063)
Deposits, net of securitizations	**18,931**	86,979	52,339
Obligations related to assets sold under repurchase agreements and securities loaned	**20,153**	18,957	3,915
Obligations related to securities sold short	**2,711**	(2,687)	3,233
Brokers and dealers receivable and payable	**47**	664	(638)
Other	**(1,230)**	(10,538)	(2,247)
Net cash from (used in) operating activities	**26,856**	24,149	15,174
Cash flows from investing activities			
Change in interest-bearing deposits with banks	**(3,109)**	(14,456)	640
Proceeds from sale of available-for-sale securities	**8,056**	10,331	8,795
Proceeds from maturity of available-for-sale securities	**34,005**	33,294	38,950
Purchases of available-for-sale securities	**(55,327)**	(51,304)	(54,208)
Proceeds from maturity of held-to-maturity securities	**1,691**	16	285
Purchases of held-to-maturity securities	**(3,155)**	(1,942)	(1,625)
Net acquisitions of premises and equipment and other intangibles	**(1,257)**	(1,337)	(1,227)
Proceeds from dispositions	**634**	255	173
Cash used in acquisitions	**(2,964)**	–	–
Net cash from (used in) investing activities	**(21,426)**	(25,143)	(8,217)
Cash flows from financing activities			
Redemption of trust capital securities	**(1,200)**	–	(900)
Issue of subordinated debentures	**3,606**	1,000	2,000
Repayment of subordinated debentures	**(1,500)**	(1,700)	(1,600)
Issue of common shares	**307**	62	150
Common shares purchased for cancellation	**(362)**	–	(113)
Issue of preferred shares	**1,475**	1,350	1,000
Redemption of preferred shares	**–**	(325)	(1,525)
Preferred shares purchased for cancellation	**(264)**	–	–
Sales of treasury shares	**5,145**	6,215	5,457
Purchases of treasury shares	**(5,261)**	(6,250)	(5,428)
Dividends paid	**(4,997)**	(4,564)	(4,211)
Issuance costs	**(16)**	(21)	(14)
Dividends/distributions paid to non-controlling interests	**(63)**	(92)	(94)
Change in short-term borrowings of subsidiaries	**(4)**	(105)	(6)
Net cash from (used in) financing activities	**(3,134)**	(4,430)	(5,284)
Effect of exchange rate changes on cash and due from banks	**181**	455	198
Net change in cash and due from banks	**2,477**	(4,969)	1,871
Cash and due from banks at beginning of period (1)	**12,452**	17,421	15,550
Cash and due from banks at end of period (1)	**$ 14,929**	$ 12,452	$ 17,421
Cash flows from operating activities include:			
Amount of interest paid	**$ 7,097**	$ 7,096	$ 7,186
Amount of interest received	**23,237**	21,132	20,552
Amount of dividend received	**1,680**	1,843	1,702
Amount of income taxes paid	**1,581**	2,046	2,315

(1) We are required to maintain balances with central banks and other regulatory authorities. The total balances were $3.3 billion as at October 31, 2016 (October 31, 2015 – $2.6 billion; October 31, 2014 – $2.0 billion; November 1, 2013 – $2.6 billion).

The accompanying notes are an integral part of these Consolidated Financial Statements.

Note 1 General information

Royal Bank of Canada and its subsidiaries (the Bank) provide diversified financial services including personal and commercial banking, wealth management, insurance, investor services and capital markets products and services on a global basis. Refer to Note 30 for further details on our business segments.

The parent bank, Royal Bank of Canada, is a Schedule I Bank under the *Bank Act* (Canada) incorporated and domiciled in Canada. Our corporate headquarters are located at Royal Bank Plaza, 200 Bay Street, Toronto, Ontario, Canada and our head office is located at 1 Place Ville-Marie, Montreal, Quebec, Canada. Our common shares are listed on the Toronto Stock Exchange and New York Stock Exchange with the ticker symbol RY.

These Consolidated Financial Statements are prepared in compliance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB). Unless otherwise stated, monetary amounts are stated in Canadian dollars. Tabular information is stated in millions of dollars, except per share amounts and percentages. These Consolidated Financial Statements also comply with Subsection 308 of the *Bank Act* (Canada), which states that, except as otherwise specified by the Office of the Superintendent of Financial Institutions (OSFI), our Consolidated Financial Statements are to be prepared in accordance with IFRS. The accounting policies outlined in Note 2 have been consistently applied to all periods presented.

On November 29, 2016, the Board of Directors authorized the Consolidated Financial Statements for issue.

Note 2 Summary of significant accounting policies, estimates and judgments

The significant accounting policies used in the preparation of these Consolidated Financial Statements, including the accounting requirements prescribed by OSFI, are summarized below. These accounting policies conform, in all material respects, to IFRS.

General

Use of estimates and assumptions

In preparing our Consolidated Financial Statements, management is required to make subjective estimates and assumptions that affect the reported amount of assets, liabilities, net income and related disclosures. Estimates made by management are based on historical experience and other assumptions that are believed to be reasonable. Key sources of estimation uncertainty include: securities impairment, determination of fair value of financial instruments, the allowance for credit losses, derecognition of financial assets, insurance claims and policy benefit liabilities, pensions and other post-employment benefits, income taxes, carrying value of goodwill and other intangible assets, litigation provisions, and deferred revenue under the credit card customer loyalty reward program. Accordingly, actual results may differ from these and other estimates thereby impacting our future Consolidated Financial Statements. Refer to the relevant accounting policies in this Note for details on our use of estimates and assumptions.

Significant judgments

In preparation of these Consolidated Financial Statements, management is required to make significant judgments that affect the carrying amounts of certain assets and liabilities and the reported amounts of revenues and expenses recorded during the period. Significant judgments have been made in the following areas and discussed as noted in the Consolidated Financial Statements:

Consolidation of structured entities	Note 2 – page 126 Note 7 – page 158	Securities impairment	Note 2 – page 128 Note 4 – page 151
Fair value of financial instruments	Note 2 – page 129 Note 3 – page 138	Application of the effective interest method	Note 2 – page 131
Allowance for credit losses	Note 2 – page 131 Note 5 – page 155	Derecognition of financial assets	Note 2 – page 132 Note 6 – page 157
Employee benefits	Note 2 – page 133 Note 17 – page 176	Income taxes	Note 2 – page 134 Note 24 – page 188
Goodwill and other intangibles	Note 2 – page 134 Note 10 – page 168 Note 11 – page 170	Provisions	Note 2 – page 135 Note 26 – page 190 Note 27 – page 194

Basis of consolidation

Our Consolidated Financial Statements include the assets and liabilities and results of operations of the parent company, Royal Bank of Canada, and its subsidiaries, including certain structured entities, after elimination of intercompany transactions, balances, revenues and expenses.

Consolidation

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 in an agency capacity. 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 different parties control an entity depending on whether those factors and conditions are assessed in isolation or in totality. Significant judgment is applied in assessing the relevant factors and conditions in totality when determining whether we control an entity. Specifically, judgment is applied in 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 we obtain control 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.

Non-controlling interests in subsidiaries that we consolidate are shown on our Consolidated Balance Sheets as a separate component of equity which is distinct from our shareholders' equity. The net income attributable to non-controlling interests is separately disclosed in our Consolidated Statements of Income.

Investments in joint ventures and associates

Our investments in associated corporations and limited partnerships over which we have significant influence are accounted for using the equity method. The equity method is also applied to our interests in joint ventures over which we have joint control. Under the equity method of accounting, investments are initially recorded at cost, and the carrying amount is increased or decreased to recognize our share of the investee's net profit or loss, including our proportionate share of the investee's other comprehensive income (OCI), subsequent to the date of acquisition.

Non-current assets held for sale and discontinued operations

Non-current assets (and disposal groups) are classified as held for sale if their carrying amounts will be recovered principally through a sale transaction rather than through continuing use. This condition is satisfied when the asset is available for immediate sale in its present condition, management is committed to the sale, and it is highly probable to occur within one year. Non-current assets (and disposal groups) classified as held for sale are measured at the lower of their previous carrying amount and fair value less costs to sell and if significant, are presented separately from other assets on our Consolidated Balance Sheets.

A disposal group is classified as a discontinued operation if it meets the following conditions: (i) it is a component that can be distinguished operationally and financially from the rest of our operations and (ii) it represents either a separate major line of business or is part of a single co-ordinated plan to dispose of a separate major line of business or geographical area of operations. Disposal groups classified as discontinued operations are presented separately from our continuing operations in our Consolidated Statements of Income.

Changes in accounting policies

During the first quarter, we adopted the following accounting policies as a result of the acquisition of City National Corporation (City National).

Acquired Loans

Acquired loans are initially measured at fair value, which reflects estimates of incurred and expected future credit losses at the acquisition date and interest rate premiums or discounts relative to prevailing market rates. No allowance for credit losses is recorded on acquisition. At the purchase date, acquired loans are classified as performing where we expect timely collection of all amounts due according to the original contractual terms and as acquired credit-impaired (ACI) where it is probable that we will be unable to collect all amounts due according to the original contractual terms.

Acquired performing loans are subsequently accounted for at amortized cost using the effective interest method. The expected future cash flows used in this calculation are based on the contractual terms of the asset and any acquisition-related premiums and discounts. Credit-related discounts relating to incurred losses for acquired loans are not accreted. Acquired loans are assessed for impairment at each balance sheet date in a manner consistent with assessments performed for our originated loan portfolio.

Acquired Credit-Impaired Loans

ACI loans, which include Federal Deposit Insurance Corporation (FDIC) covered loans, are identified as impaired on acquisition based on the specific risk characteristics of the loans, including indications that the borrower is experiencing significant financial difficulty, probability of bankruptcy or other financial reorganization, payment status or economic conditions that correlate with defaults.

ACI loans are measured at fair value on acquisition based on the present value of expected future cash flows and subsequently accounted for at amortized cost using the effective interest method. Estimates of expected future cash flows are reassessed at each balance sheet date for changes in expected default rates, loss severities, the amount and timing of prepayments, and other factors that are reflective of current market conditions. Probable decreases in expected future cash flows result in an impairment loss, which is measured as the difference between the carrying amount of the loan and the present value of the revised expected future cash flows, discounted at the loan's effective interest rate. Impairment losses result in an increase to the Allowance for credit losses which is recorded through the Provision for credit losses in our Consolidated Statements of Income. Probable increases in expected future cash flows result in a reversal of previous impairment losses, with the present value of any remaining increase recognized as Interest income.

Federal Deposit Insurance Corporation Covered Loans

FDIC covered loans are loans subject to loss-share agreements with the FDIC. Under these agreements, the FDIC reimburses us for 80% of the net losses incurred on the underlying loan portfolio. Impairment losses are recognized on acquired FDIC covered loans consistent with other ACI loans, as described above. The amounts expected to be reimbursed by the FDIC are recognized separately as indemnification assets.

Indemnification assets are initially recorded at fair value and are subsequently adjusted for any changes in estimates related to the overall collectability of the underlying loan portfolio. Additional impairment losses on the underlying loan portfolio generally result in an increase of the indemnification asset through the Provision for credit losses. Decreases in expected losses on the underlying loan portfolio generally result in a decrease of the indemnification asset through the Provision for credit losses to the extent that impairment losses were previously taken, with the remainder recorded in Net interest income. The indemnification asset is drawn down as payments are received from the FDIC pertaining to the loss-share agreements. Indemnification assets are recorded in Other assets on the Consolidated Balance Sheets.

In accordance with each loss-share agreement, we may be required to make a payment to the FDIC if actual losses incurred are less than the intrinsic loss estimate as defined in the loss-share agreements (clawback liability). The clawback liability is determined as 20% of the excess between the intrinsic loss estimate and actual covered losses determined in accordance with each loss-share agreement, net of specified servicing costs. Subsequent changes to the estimated clawback liability are considered in determining the adjustment to the indemnification asset as described above. Clawback liabilities are recorded in Other liabilities on the Consolidated Balance Sheets.

Financial instruments – Recognition and measurement

Securities

Securities are classified at inception, based on management's intention, as at fair value through profit or loss (FVTPL), available-for-sale (AFS) or held-to-maturity. Certain debt securities with fixed or determinable payments and which are not quoted in an active market may be classified as loans and receivables.

Trading securities include securities purchased for sale in the near term which are classified as at FVTPL by nature and securities designated as at FVTPL under the fair value option. Obligations to deliver trading securities sold but not yet purchased are recorded as liabilities and carried at fair value. Realized and unrealized gains and losses on these securities are recorded as Trading revenue in Non-interest income. Dividends and interest income accruing on Trading securities are recorded in Interest income. Interest and dividends accrued on interest-bearing and equity securities sold short are recorded in Interest expense.

AFS securities include: (i) securities which may be sold to meet liquidity needs, in response to or in anticipation of changes in interest rates and resulting prepayment risk, changes in foreign currency risk, changes in funding sources or terms, and (ii) loan substitute securities which are client financings that have been structured as after-tax investments rather than conventional loans in order to provide the clients with a borrowing rate advantage. AFS securities are measured at fair value. Unrealized gains and losses arising from changes in fair value are recorded in OCI. Changes in foreign exchange rates for AFS equity securities are recognized in Other components of equity, while changes in foreign exchange rates for AFS debt securities are recognized in Foreign exchange revenue, other than trading in Non-interest income. When the security is sold, the cumulative gain or loss recorded in Other components of equity is included as Net gains on AFS securities in Non-interest income. Purchase premiums or discounts on AFS debt securities are amortized over the life of the security using the effective interest method and are recognized in Net interest income. Dividends and interest income accruing on AFS securities are recorded in Interest income.

At each reporting date, and more frequently when conditions warrant, we evaluate our AFS securities to determine whether there is any objective evidence of impairment. Such evidence includes: for debt instruments, when an adverse effect on future cash flows from the asset or group of assets can be reliably estimated; for equity securities, when there is a significant or prolonged decline in the fair value of the investment below its cost.

When assessing debt securities for impairment, we primarily consider counterparty ratings and security-specific factors, including subordination, external ratings, and the value of any collateral held for which there may not be a readily-accessible market. Significant judgment is required in assessing impairment as management is required to consider all available evidence in determining whether objective evidence of impairment exists and whether the principal and interest on the AFS debt security can be fully recovered. For complex debt instruments, we use cash flow projection models which incorporate actual and projected cash flows for each security based on security-specific factors using a number of assumptions and inputs that involve management judgment, such as default, prepayment and recovery rates. Due to the subjective nature of choosing these inputs and assumptions, the actual amount of the future cash flows and their timing may differ from the estimates used by management and consequently may cause a different conclusion as to the recognition of impairment or measurement of impairment loss.

When assessing equity securities for impairment, we consider factors which include the length of time and extent the fair value has been below cost, along with management's assessment of the financial condition, business and other risks of the issuer. Management weighs all these factors to determine the impairment but to the extent that management judgment may differ from the actual experience of the timing and amount of the recovery of the fair value, the estimate for impairment could change from period to period based upon future events that may or may not occur, and the conclusion for the impairment of the equity securities may differ.

If an AFS security is impaired, the cumulative unrealized loss previously recognized in Other components of equity is removed from equity and recognized in Net gains on AFS securities under Non-interest income. This amount is determined as the difference between the cost/amortized cost and current fair value of the security less any impairment loss previously recognized. Subsequent to impairment, further declines in fair value are recorded in Non-interest income, while increases in fair value are recognized in Other components of equity until sold. For AFS debt securities, reversal of previously recognized impairment losses is recognized in our Consolidated Statements of Income if the recovery is objectively related to a specific event occurring after recognition of the impairment loss.

Held-to-maturity securities are debt securities where we have the intention and the ability to hold the investment until its maturity date. These securities are initially recorded at fair value and are subsequently measured at amortized cost using the effective interest method, less any impairment losses which we assess using the same impairment model as for loans. Interest income and amortization of premiums and discounts on debt securities are recorded in Net interest income. For held-to-maturity securities, reversal of previously recognized impairment losses is recognized in our Consolidated Statements of Income if the recovery is objectively related to a specific event occurring after the recognition of the impairment loss. Reversals of impairment losses on held-to-maturity securities are recorded to a maximum of what the amortized cost of the investment would have been, had the impairment not been recognized at the date the impairment is reversed. Held-to-maturity securities have been included with AFS securities on our Consolidated Balance Sheets.

We account for all of our securities using settlement date accounting and changes in fair value between the trade date and settlement date are reflected in income for securities classified or designated as at FVTPL, and changes in the fair value of AFS securities between the trade and settlement dates are recorded in OCI except for changes in foreign exchange rates on debt securities, which are recorded in Non-interest income.

Fair value option

A financial instrument can be designated as at FVTPL (the fair value option) on its initial recognition even if the financial instrument was not acquired or incurred principally for the purpose of selling or repurchasing it in the near term. An instrument that is designated as at FVTPL by way of this fair value option must have a reliably measurable fair value and satisfy one of the following criteria: (i) it eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise from measuring assets or liabilities, or recognizing gains and losses on them, on a different basis (an accounting mismatch); (ii) it belongs to a group of financial assets or financial liabilities or both that are managed, evaluated, and reported to key management personnel on a fair value basis in accordance with our risk management strategy, and we can demonstrate that significant financial risks are eliminated or significantly reduced; or (iii) there is an embedded derivative in the financial or non-financial host contract and the derivative is not closely related to the host contract. These instruments cannot be reclassified out of the FVTPL category while they are held or issued.

Financial assets designated as at FVTPL are recorded at fair value and any unrealized gain or loss arising due to changes in fair value is included in Trading revenue or Non-interest income – Other. Financial liabilities designated as at FVTPL are recorded at fair value and fair value changes attributable to changes in our own credit risk are recorded in OCI. Amounts recognized in OCI will not be reclassified subsequently to net income. The remaining fair value changes are recorded in Trading revenue or Non-interest income – Other. Upon initial recognition, if we determine that presenting the effects of own credit risk changes in OCI would create or enlarge an accounting mismatch in net income, the full fair value change in our debt designated as at FVTPL is recognized in net income.

To determine the fair value adjustments on our debt designated as at FVTPL, we calculate the present value of the instruments based on the contractual cash flows over the term of the arrangement by using our effective funding rate at the beginning and end of the period with the change in present value recorded in OCI, Trading revenue or Non-interest income – Other as appropriate.

Determination of fair value

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 all factors that market participants would consider in setting a price, including commonly accepted valuation approaches.

The Board of Directors provides oversight on valuation of financial instruments, primarily through the Audit Committee and Risk Committee. The Audit Committee reviews the presentation and disclosure of financial instruments that are measured at fair value, while the Risk Committee assesses adequacy of governance structures and control processes for valuation of these instruments.

We have established policies, procedures and controls for valuation methodologies and techniques to ensure fair value is reasonably estimated. Major valuation processes and controls include, but are not limited to, profit and loss decomposition, independent price verification (IPV) and model validation standards. These control processes are managed by either Finance or Group Risk Management and are independent of the relevant businesses and their trading functions. Profit and loss decomposition is a process to explain the fair value changes of certain positions and is performed daily for trading portfolios. All fair value instruments are subject to IPV, a process whereby trading function valuations are verified against external market prices and other relevant market data. Market data sources include traded prices, brokers and price vendors. We give priority to those third-party pricing services and prices having 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, to other pricing service values and, when available, to 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. Valuation models are approved for use within our model risk management framework. The framework addresses, among other things, model development standards, validation processes and procedures, and approval authorities. Model validation ensures that a model is suitable for its intended use and sets parameters for its use. All models are revalidated regularly by qualified personnel who are independent of the model design and development. Annually our model risk profile is reported to the Board of Directors.

IFRS 13 *Fair Value Measurement* permits an exception, through an accounting policy choice, to measure fair value of a portfolio of financial instruments on a net open risk position basis when certain criteria are met. We have elected to use this policy choice to determine fair value of certain portfolios of financial instruments, primarily derivatives, based on a net exposure to market or credit risk.

We record valuation adjustments to appropriately reflect counterparty credit quality of our derivative portfolio, differences between the overnight index swap (OIS) curve and London Interbank Offered Rates (LIBOR) for collateralized derivatives, funding valuation adjustments (FVA) for uncollateralized and under-collateralized over-the-counter (OTC) derivatives, unrealized gains or losses at inception of the transaction, bid-offer spreads, unobservable parameters and model limitations. These adjustments may be subjective as they require significant judgment in the input selection, such as implied probability of default and recovery rate, and are intended to arrive at 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 is previously estimated using management judgment, and may therefore impact unrealized gains and losses recognized in Non-interest income – Trading revenue or Other.

Valuation adjustments are recorded for the credit risk of our derivative portfolios in order to arrive at their fair values. Credit valuation adjustments (CVA) take into account our counterparties' creditworthiness, the current and potential future mark-to-market of the transactions, and the effects of credit mitigants such as master netting and collateral agreements. CVA amounts are derived from estimates of exposure at default, probability of default, recovery rates on a counterparty basis, and market and credit factor correlations. Exposure at default is the amounts of expected derivative related assets and liabilities at the time of default, estimated through modeling using underlying risk factors. Probability of default and recovery rate are implied from the market prices for credit protection and credit ratings of the counterparty. When market data is unavailable, it is estimated by incorporating assumptions and adjustments that market participants would use in determining fair value using these inputs. Correlation is the statistical measure of how credit and market factors may move in relation to one another. Correlation is estimated using historical data. CVA is calculated daily and changes are recorded in Non-interest income – Trading revenue.

In the determination of fair value of collateralized OTC derivatives using the OIS curve, our valuation approach accounts for the difference between certain OIS rates and LIBOR for derivatives valuation as valuation adjustments.

FVA are also calculated to incorporate cost and benefit of funding in the valuation of uncollateralized and under-collateralized OTC derivatives. Future expected cash flows of these derivatives are discounted to reflect the cost and benefit of funding the derivatives by using a funding curve, implied volatilities and correlations as inputs.

Where required, a valuation adjustment is made to reflect the unrealized gain or loss at inception of a financial instrument contract where the fair value of that financial instrument is not obtained from a quoted market price or cannot be evidenced by other observable market transactions based on a valuation technique incorporating observable market data.

A bid-offer valuation adjustment is required when a financial instrument is valued at the mid-market price, instead of the bid or offer price for asset or liability positions, respectively. The valuation adjustment takes into account the spread from the mid to either the bid or offer price.

Some valuation models require parameter calibration from such factors as market observed option prices. The calibration of parameters may be sensitive to factors such as the choice of instruments or optimization methodology. A valuation adjustment is also estimated to mitigate the uncertainties of parameter calibration and model limitations.

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 for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). Determination of fair value based on this hierarchy requires 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 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 in the determination of the model used, the selection of model inputs, and in some cases the application of valuation adjustments to the model value or quoted price for inactively traded financial instruments, as 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.

Interest
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.

Transaction costs
Transaction costs are expensed as incurred for financial instruments classified or designated as at FVTPL. For other financial instruments, transaction costs are capitalized on initial recognition. For financial assets and financial liabilities measured at amortized cost, capitalized transaction costs are amortized through net income over the estimated life of the instrument using the effective interest method. For AFS financial assets measured at fair value that do not have fixed or determinable payments and no fixed maturity, capitalized transaction costs are recognized in net income when the asset is derecognized or becomes impaired.

Offsetting financial assets and financial liabilities
Financial assets and financial liabilities are offset on the balance sheet when there exists both a legally enforceable right to offset the recognized amounts and an intention to settle on a net basis, or realize the asset and settle the liability simultaneously.

Assets purchased under reverse repurchase agreements and sold under repurchase agreements
We purchase securities under agreements to resell (reverse repurchase agreements) and take possession of these securities. We monitor the market value of the securities purchased and additional collateral is obtained when appropriate. We have the right to liquidate the collateral held in the event of counterparty default. Reverse repurchase agreements are treated as collateralized lending transactions. We also sell securities under agreements to repurchase (repurchase agreements), which are treated as collateralized borrowing transactions. The securities received under reverse repurchase agreements and securities delivered under repurchase agreements are not recognized on, or derecognized from, our Consolidated Balance Sheets, respectively, unless the risks and rewards of ownership are obtained or relinquished.

Reverse repurchase agreements and repurchase agreements are carried on our Consolidated Balance Sheets at the amounts at which the securities were initially acquired or sold, except when they are designated as at FVTPL and are recorded at fair value. Interest earned on reverse repurchase agreements is included in Interest income, and interest incurred on repurchase agreements is included in Interest expense in our Consolidated Statements of Income. Changes in fair value for reverse repurchase agreements and repurchase agreements designated as at FVTPL are included in Trading revenue or Other in Non-interest income.

Derivatives
Derivatives are primarily used in sales and trading activities. Derivatives are also used to manage our exposure to interest, currency, credit and other market risks. The most frequently used derivative products are interest rate swaps, interest rate futures, forward rate agreements, interest rate options, foreign exchange forward contracts, cross currency swaps, foreign currency futures, foreign currency options, equity swaps and credit derivatives. All derivative instruments are recorded on our Consolidated Balance Sheets at fair value, including those derivatives that are embedded in financial or non-financial contracts and are not closely related to the host contracts.

When derivatives are embedded in other financial instruments or host contracts, such combinations are known as hybrid instruments with the effect that some of the cash flows of a hybrid instrument vary in a way similar to a stand-alone derivative. If the host contract is not carried at fair value with changes in fair value reported in our Consolidated Statements of Income, the embedded derivative is generally required to be separated from the host contract and accounted for separately as at FVTPL if the economic characteristics and risks of the embedded derivative are not closely related to those of the host contract. All embedded derivatives are presented on a combined basis with the host contracts although they are separated for measurement purposes when conditions requiring separation are met.

When derivatives are used in sales and trading activities, the realized and unrealized gains and losses on these derivatives are recognized in Trading revenue in Non-interest income. Derivatives with positive fair values are reported as Derivative assets and derivatives with negative fair values are reported as Derivative liabilities. In accordance with our policy for offsetting financial assets and financial liabilities, the net fair value of certain derivative assets and liabilities are reported as an asset or liability, as appropriate. Valuation adjustments are included in the fair value of Derivative assets and Derivative liabilities. Premiums paid and premiums received are shown in Derivative assets and Derivative liabilities, respectively.

When derivatives are used to manage our own exposures, we determine for each derivative whether hedge accounting can be applied, as discussed in the Hedge accounting section below.

Hedge accounting
We use derivatives and non-derivatives in our hedging strategies to manage our exposure to interest rate, currency, credit and other market risks. Where hedge accounting can be applied, a hedge relationship is designated and documented at inception to detail the particular risk management objective and strategy for undertaking the hedge transaction. The documentation identifies the specific asset, liability or anticipated cash flows being hedged, the risk that is being hedged, the type of hedging instrument used and how effectiveness will be assessed. We assess, both at the inception of the hedge and on an ongoing basis, whether the hedging instruments are 'highly effective' in offsetting changes in the fair value or cash flows of the hedged items. A hedge is regarded as highly effective only if the following criteria are met: (i) at inception of the hedge and throughout its life, the hedge is expected to be highly effective in achieving offsetting changes in fair value or cash flows attributable to the hedged risk, and (ii) actual results of the hedge are within a pre-determined range. In the case of hedging a forecast transaction, the transaction must have a high probability of occurring and must present an exposure to variations in cash flows that could ultimately affect the reported net profit or loss. Hedge accounting is discontinued when it is determined that the hedging instrument is no longer effective as a hedge, the hedging instrument or hedged item is terminated or sold, or the forecast transaction is no longer deemed highly probable. Refer to Note 8 for the fair value of derivatives and non-derivative instruments categorized by their hedging relationships as well as derivatives that are not designated in hedging relationships.

Fair value hedges
In a fair value hedging relationship, the carrying value of the hedged item is adjusted for changes in fair value attributable to the hedged risk and recognized in Non-interest income. Changes in fair value of the hedged item, to the extent that the hedging relationship is effective, are offset by changes in the fair value of the hedging derivative, which are also recognized in Non-interest income. When hedge accounting is discontinued, the carrying value of the hedged item is no longer adjusted and the cumulative fair value adjustments to the carrying value of the hedged items are amortized to Net income over the remaining life of the hedged items.

We predominantly use interest rate swaps to hedge our exposure to changes in a fixed interest rate instrument's fair value caused by changes in interest rates.

Cash flow hedges
In a cash flow hedging relationship, the effective portion of the change in the fair value of the hedging derivative, net of taxes, is recognized in OCI while the ineffective portion is recognized in Non-interest income. When hedge accounting is discontinued, the cumulative amounts previously recognized in Other components of equity are reclassified to Net interest income during the periods when the variability in the cash flows of the hedged item affects Net interest income. Unrealized gains and losses on derivatives are reclassified immediately to Net income when the hedged item is sold or terminated early, or when the forecast transaction is no longer expected to occur.

We predominantly use interest rate swaps to hedge the variability in cash flows related to a variable-rate asset or liability.

Net investment hedges
In hedging our foreign currency exposure to a net investment in a foreign operation, the effective portion of foreign exchange gains and losses on the hedging instruments, net of applicable taxes, is recognized in OCI and the ineffective portion is recognized in Non-interest income. The amounts, or a portion thereof, previously recognized in Other components of equity are recognized in Net income on the disposal, or partial disposal, of the foreign operation.

We use foreign exchange contracts and foreign currency-denominated liabilities to manage our foreign currency exposures to net investments in foreign operations having a functional currency other than the Canadian dollar.

Loans
Loans are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market and which are not classified as AFS. Loans are initially recognized at fair value. When loans are issued at a market rate, fair value is represented by the cash advanced to the borrowers. Loans are subsequently measured at amortized cost using the effective interest method less impairment, unless we intend to sell them in the near future upon origination or they have been designated as at FVTPL, in which case they are carried at fair value.

We assess at each balance sheet date whether there is objective evidence that the loans (including debt securities reclassified as loans) are impaired. Evidence of impairment may include indications that the borrower is experiencing significant financial difficulty, probability of bankruptcy or other financial reorganization, as well as a measurable decrease in the estimated future cash flows evidenced by the adverse changes in the payments status of the borrower or economic conditions that correlate with defaults. Whenever a payment is 90 days past due, loans other than credit card balances and loans guaranteed or insured by a Canadian government (Federal or Provincial) or a Canadian government agency (collectively, Canadian government) are classified as impaired unless they are fully secured and collection efforts are reasonably expected to result in repayment of debt within 180 days of the loans becoming past due. Loans guaranteed by a Canadian government are classified as impaired when the loan is contractually 365 days in arrears. Credit card balances are written off when a payment is 180 days in arrears.

Assets acquired to satisfy loan commitments are recorded at their fair value less costs to sell. Fair value is determined based on either current market value where available or discounted cash flows. Any excess of the carrying value of the loan over the fair value of the assets acquired is recognized by a charge to Provision for credit losses.

Interest on loans is recognized in Interest income – Loans using the effective interest method. The estimated future cash flows used in this calculation include those determined by the contractual term of the asset, all fees that are considered to be integral to the effective interest rate, transaction costs and all other premiums or discounts. Fees that relate to activities such as originating, restructuring or renegotiating loans are deferred and recognized as Interest income over the expected term of such loans using the effective interest method. Where there is a reasonable expectation that a loan will be originated, commitment and standby fees are also recognized as interest income over the expected term of the resulting loans using the effective interest method. Otherwise, such fees are recorded as Other Liabilities and amortized into Non-interest income over the commitment or standby period. Prepayment fees on mortgage loans are not included as part of the effective interest rate at origination as the amounts are not reliably measurable. If prepayment fees are received on a renewal of a mortgage loan, the fee is included as part of the effective interest rate, and if not renewed, the prepayment fee is recognized in interest income at the prepayment date.

Allowance for credit losses
An allowance for credit losses is established if there is objective evidence that we will be unable to collect all amounts due on our loans portfolio according to the original contractual terms or the equivalent value. This 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.

The allowance for credit losses is increased by the impairment losses recognized and decreased by the amount of write-offs, net of recoveries. The allowance for credit losses for on-balance sheet items is included as a reduction to assets, and the allowance for credit losses relating to off-balance sheet items is included in Provisions under Other Liabilities.

We assess whether objective evidence of impairment exists individually for loans that are individually significant and collectively for loans that are not individually significant. If we determine that no objective evidence of impairment exists for an individually assessed loan, whether significant or not, the loan is included in a group of loans with similar credit risk characteristics and collectively assessed for impairment. Loans that are individually assessed for impairment and for which an impairment loss is recognized are not included in a collective assessment of impairment.

Allowance for credit losses represent management's best estimates of losses incurred in our loan portfolio at the balance sheet date. Management's judgment is required in making assumptions and estimations when calculating allowances on both individually and collectively assessed loans. The underlying assumptions and estimates used for both individually and collectively assessed loans can change from period to period and may significantly affect our results of operations.

Individually assessed loans
Loans which are individually significant are assessed individually for objective indicators of impairment. A loan is considered impaired when management determines that it will not be able to collect all amounts due according to the original contractual terms or the equivalent value.

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 amount 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. Individually-assessed impairment losses reduce the carrying amount of the loan through the use of an allowance account and the amount of the loss is recognized in Provision for credit losses in our Consolidated Statements of Income. Following impairment, interest income is recognized on the unwinding of the discount from the initial recognition of impairment.

Significant judgment is required in assessing evidence of impairment and estimation of the amount and timing of future cash flows when determining the impairment loss. When assessing objective evidence of impairment, we primarily consider specific factors such as the financial condition of the borrower, borrower's default or delinquency in interest or principal payments, local economic conditions and other observable data. In determining the estimated recoverable amount, we consider discounted expected future cash flows at the effective interest rate using a number of assumptions and inputs. Management judgment is involved when choosing these inputs and assumptions used, such as the expected amount of the loan that will not be recovered and the cost of time delays in collecting principal and/or interest, and when estimating the value of any collateral held for which there may not be a readily accessible market. Changes in the amount expected to be recovered would have a direct impact on the Provision for credit losses and may result in a change in the Allowance for credit losses.

Collectively assessed loans

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 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, in portfolios of similar credit risk characteristics, 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 and 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 the contractual cash flows of the loans in the group and historical loss experience for loans with credit risk characteristics similar to those in the group. Historical loss experience is adjusted based on current observable data to reflect the effects of current conditions that did not affect the period on which the historical loss experience is based and to remove the effects of conditions in the historical period that do not currently exist. The methodology and assumptions used for estimating future cash flows are reviewed regularly to reduce any differences between loss estimates and actual loss experience. Collectively-assessed impairment losses reduce the carrying amount of the aggregated loan position through an allowance account and the amount of the loss is recognized in Provision for credit losses. Following impairment, interest income is recognized on the unwinding of the discount from the initial recognition of impairment.

The methodology and assumptions used to calculate collective impairment allowances are subject to uncertainty, in part because it is not practicable to identify losses on an individual loan basis due to the large number of individually insignificant loans in the portfolio. Significant judgment is required in assessing historical loss experience, the loss identification period and its relationship to current portfolios including delinquency, and loan balances; and current business, economic and credit conditions including industry specific performance, unemployment and country risks. Changes in these assumptions would have a direct impact on the Provision for credit losses and may result in changes in the related Allowance for credit losses.

Write-off of loans

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 credit cards, the balances and related allowance for credit losses are written off when payment is 180 days in arrears. Personal loans are generally written off at 150 days past due.

Derecognition of financial assets

Financial assets are derecognized from our Consolidated Balance Sheets when our contractual rights to the cash flows from the assets have expired, when we retain the rights to receive the cash flows of the assets 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 risk 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 the contractual rights to the cash flows from the transferred assets have expired or whether we retain the rights to receive cash flows on the assets but assume an obligation to pay for those cash flows. We derecognize transferred financial assets if we transfer substantially all the risk and rewards of the ownership in the assets. When assessing whether we have transferred substantially all of the risk and rewards of the transferred assets, management considers the Bank's exposure before and after the transfer with the variability in the amount and timing of the net cash flows of the transferred assets. In transfers in which we retain the servicing rights, management has applied judgment in assessing the benefits of servicing against market expectations. When the benefits of servicing are greater than fair value, a servicing asset is recognized in Other assets in our Consolidated Balance Sheets. When the benefits of servicing are less than fair value, a servicing liability is recognized in Other liabilities in our Consolidated Balance Sheets.

Derecognition of financial liabilities

We derecognize a financial liability from our Consolidated Balance Sheets when our obligation specified in the contract expires, or is discharged or cancelled. We recognize the difference between the carrying amount of a financial liability transferred and the consideration paid in our Consolidated Statements of Income.

Guarantees

Financial guarantee contracts are contracts that contingently require us to make specified payments (in cash, other assets, our own shares or provision of services) to reimburse the holder for a loss it incurs because a specified debtor fails to make payment when due in accordance with the original or modified terms of a debt instrument. Liabilities are recognized on our Consolidated Balance Sheets at the inception of a guarantee for the fair value of the obligation undertaken in issuing the guarantee. Financial guarantees are subsequently remeasured at the higher of (i) the amount initially recognized less accumulated amortization and (ii) our best estimate of the present value of the expenditure required to settle the present obligation at the end of the reporting period.

If the financial guarantee contract meets the definition of a derivative, it is measured at fair value at each balance sheet date and reported under Derivatives on our Consolidated Balance Sheets.

Insurance and segregated funds

Premiums from long-duration contracts, primarily life insurance, are recognized when due in Non-interest income – Insurance premiums, investment and fee income. Premiums from short-duration contracts, primarily property and casualty, and fees for administrative services are recognized in Insurance premiums, investment and fee income over the related contract period. Unearned premiums of the short-duration contracts, representing the unexpired portion of premiums, are reported in Other liabilities. Investments made by our insurance operations are classified as AFS or loans and receivables, except for investments supporting the policy benefit liabilities on life and health insurance contracts and a portion of property and casualty contracts. These are designated as at FVTPL with changes in fair value reported in Insurance premiums, investment and fee income.

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 (CALM), 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.

Premiums ceded for reinsurance and reinsurance recoveries on policyholder benefits and claims incurred are reported in income and expense as appropriate. Reinsurance recoverables, which relate to paid benefits and unpaid claims, are included in Other assets.

Acquisition costs for new insurance business consist of commissions, premium taxes, certain underwriting costs and other costs that vary with the acquisition of new business. Deferred acquisition costs for life insurance products are implicitly recognized in Insurance claims and policy benefit liabilities by CALM. For property and casualty insurance, these costs are classified as Other assets and amortized over the policy term.

Segregated funds are lines of business in which we issue an insurance contract where the benefit amount is directly linked to the market value of the investments held in the underlying fund. The contractual arrangement is such that the underlying segregated fund assets are registered in our name but the segregated fund policyholders bear the risks and rewards of the funds' investment performance. Liabilities for these contracts are calculated based on contractual obligations using actuarial assumptions and are at least equivalent to the surrender or transfer value calculated by reference to the value of the relevant underlying funds or indices. Segregated funds' assets and liabilities are separately presented on our Consolidated Balance Sheets. As the segregated fund policyholders bear the risks and rewards of the funds' performance, investment income earned by the segregated funds and expenses incurred by the segregated funds are offset and are not separately presented in our Consolidated Statements of Income. Fee income we earn from segregated funds includes management fees, mortality, policy administration and surrender charges, and these fees are recorded in Non-interest income – Insurance premiums, investment and fee income. We provide minimum death benefit and maturity value guarantees on segregated funds. The liability associated with these minimum guarantees is recorded in Insurance claims and policy benefit liabilities.

Liability adequacy tests are performed for all insurance contract portfolios at each balance sheet date to ensure the adequacy of insurance contract liabilities. Current best estimates of future contractual cash flows, claims handling and administration costs, and investment returns from the assets backing the liabilities are taken into account in the tests. When the test results indicate that there is a deficiency in liabilities, the deficiency is charged immediately to our Consolidated Statements of Income by writing down the deferred acquisition costs in Other assets and/or increasing Insurance claims and policy benefit liabilities.

Employee benefits – Pensions and other post-employment benefits

Our defined benefit pension expense, which is included in Non-interest expense – Human resources, consists of the cost of employee pension benefits for the current year's service, net interest on the net defined benefit liability (asset), past service cost and gains or losses on settlement. Remeasurements of the net defined benefit liability, which comprise actuarial gains and losses and return on plan assets (excluding amounts included in net interest on the net defined benefit liability), are recognized immediately in OCI in the period in which they occur. Actuarial gains and losses comprise experience adjustments (the effects of differences between the previous actuarial assumptions and what has actually occurred), as well as the effects of changes in actuarial assumptions. Amounts recognized in OCI will not be reclassified subsequently to net income. Past service cost is the change in the present value of the defined benefit obligation resulting from a plan amendment or curtailment and is charged immediately to income.

For each defined benefit plan, we recognize the present value of our defined benefit obligations less the fair value of the plan assets as a defined benefit liability reported in Employee benefit liabilities on our Consolidated Balance Sheets. For plans where there is a net defined benefit asset, the amount is reported as an asset in Employee benefit assets on our Consolidated Balance sheets.

The calculation of defined benefit expenses and obligations requires significant judgment as the recognition is dependent on discount rates and various actuarial assumptions such as healthcare cost trend rates, projected salary increases, retirement age, and mortality and termination rates. Due to the long-term nature of these plans, such estimates and assumptions are subject to inherent risks and uncertainties. For our pension and other post-employment plans, the discount rate is determined by reference to market yields on high quality corporate bonds. Since the discount rate is based on currently available yields, and involves management's assessment of market liquidity, it is only a proxy for future yields. Actuarial assumptions, set in accordance with current practices in the respective countries of our plans, may differ from actual experience as country specific statistics are only estimates of future employee behaviour. These assumptions are determined by management and are reviewed by actuaries at least annually. Changes to any of the above assumptions may affect the amounts of benefits obligations, expenses and remeasurements that we recognize.

Our contributions to defined contribution plans are expensed when employees have rendered services in exchange for such contributions. Defined contribution plan expense is included in Non-interest expense – Human resources.

Share-based compensation

We offer share-based compensation plans to certain key employees and to our non-employee directors.

To account for stock options granted to employees, compensation expense is recognized over the applicable vesting period with a corresponding increase in equity. Fair value is determined by using option valuation models, which take into account the exercise price of the option, the current share price, the risk free interest rate, the expected volatility of the share price over the life of the option and other relevant factors. When the options are exercised, the exercise price proceeds together with the amount initially recorded in equity are credited to common shares. Our other compensation plans include performance deferred share plans and deferred share unit plans for key employees (the Plans). The obligations for the Plans are accrued over their vesting periods. The Plans are settled in cash.

For cash-settled awards, our accrued obligations are adjusted to their fair value at each balance sheet date. For share-settled awards, our accrued obligations are based on the fair value of our common shares at the date of grant. Changes in our obligations, net of related hedges, are recorded as Non-interest expense – Human resources in our Consolidated Statements of Income with a corresponding increase in Other liabilities for cash-settled awards and in Retained earnings for share-settled awards.

The compensation cost attributable to options and awards granted to employees who are eligible to retire or will become eligible to retire during the vesting period, is recognized immediately if the employee is eligible to retire on the grant date or over the period between the grant date and the date the employee becomes eligible to retire.

Our contributions to the employee savings and share ownership plans are expensed as incurred.

Income taxes

Income tax comprises current tax and deferred tax and is recognized in our Consolidated Statements of Income except to the extent that it relates to items recognized directly in equity, in which case it is recognized in equity.

Current income tax payable on profits is recognized as an expense based on the applicable tax laws in each jurisdiction in the period in which profits arise, calculated using tax rates enacted or substantively enacted by the balance sheet date. Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities for accounting and tax purposes. A deferred income tax asset or liability is determined for each temporary difference, except for earnings related to our subsidiaries, branches, associates and interests in joint ventures where the temporary differences will not reverse in the foreseeable future and we have the ability to control the timing of reversal. Deferred tax assets and liabilities are determined 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, based on tax rates and tax laws that have been enacted or substantively enacted at the balance sheet date. Current tax assets and liabilities are offset when they are levied by the same taxation authority on either the same taxable entity or different taxable entities within the same tax reporting group (which intends to settle on a net basis), and when there is a legal right to offset. Deferred tax assets and liabilities are offset when the same conditions are satisfied. Our Consolidated Statements of Income include items that are non-taxable or non-deductible for income tax purposes and, accordingly, this causes the income tax provision to be different from what it would be if based on statutory rates.

Deferred income taxes accumulated as a result of temporary differences and tax loss carryforwards are included in Other assets and Other liabilities. On a quarterly basis, we review our deferred income tax assets to determine whether it is probable that the benefits associated with these assets will be realized; this review involves evaluating both positive and negative evidence.

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 authorities. Significant judgment is required in the interpretation of the relevant tax laws, and the determination of our tax provision which includes our best estimate of tax positions that are under audit or appeal by relevant taxation authorities. We perform a review on a quarterly basis to incorporate our best assessment based on information available, but additional liability and income tax expense could result based on decisions made by the relevant tax authorities.

The determination of our deferred tax asset or liability also requires significant management judgment as the recognition is dependent on our projection of future taxable profits and tax rates that are expected to be in effect in the period the asset is realized or the liability is settled. Any changes in our projection will result in changes in deferred tax assets or liabilities on our Consolidated Balance Sheets, and also deferred tax expense in our Consolidated Statements of Income.

Business combinations, goodwill and other intangibles

All business combinations are accounted for using the acquisition method. Non-controlling interests, if any, are recognized at their proportionate share of the fair value of identifiable assets and liabilities, unless otherwise indicated. Identifiable intangible assets are recognized separately from goodwill and included in Other intangibles. Goodwill represents the excess of the price paid for the business acquired over the fair value of the net identifiable assets acquired on the date of acquisition.

Goodwill

Goodwill is allocated to cash-generating units or groups of cash-generating units (CGU) for the purpose of impairment testing, which is undertaken at the lowest level at which goodwill is monitored for internal management purposes. Impairment testing is performed annually as at August 1, or more frequently if there are objective indicators of impairment, by comparing the recoverable amount of a CGU with its carrying amount. The recoverable amount of a CGU is the higher of its value in use and its fair value less costs of disposal. Value in use is the present value of the expected future cash flows from a CGU. Fair value less costs of disposal is the amount obtainable from the sale of a CGU in an orderly transaction between market participants, less disposal costs. The fair value of a CGU is estimated using valuation techniques such as a discounted cash flow method, adjusted to reflect the considerations of a prospective third-party buyer. External evidence such as binding sale agreements or recent transactions for similar businesses within the same industry is considered to the extent that it is available.

Significant judgment is involved in estimating the model inputs used to determine the recoverable amount of our CGU, in particular future cash flows, discount rates and terminal growth rates, due to the uncertainty in the timing and amount of cash flows and the forward-looking nature of these inputs. Future cash flows are based on financial plans agreed by management which are estimated based on forecast results, business initiatives, planned capital investments and returns to shareholders. Discount rates are based on the bank-wide cost of capital, adjusted for CGU-specific risks and currency exposure as reflected by differences in expected inflation. Bank-wide cost of capital is based on the Capital Asset Pricing Model. 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). Terminal growth rates reflect the expected long-term gross domestic product growth and inflation for the countries within which the CGU operates. Changes in these assumptions may impact the amount of impairment loss recognized in Non-interest expense.

The carrying amount of a CGU includes the carrying amount of assets, liabilities and goodwill allocated to the CGU. If the recoverable amount is less than the carrying value, the impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the CGU

and then to the other non-financial assets of the CGU proportionately based on the carrying amount of each asset. Any impairment loss is charged to income in the period in which the impairment is identified. Goodwill is stated at cost less accumulated impairment losses. Subsequent reversals of goodwill impairment are prohibited.

Upon disposal of a portion of a CGU, the carrying amount of goodwill relating to the portion of the CGU sold is included in the determination of gains or losses on disposal. The carrying amount is determined based on the relative fair value of the disposed portion to the total CGU.

Other intangibles

Intangible assets represent identifiable non-monetary assets and are acquired either separately or through a business combination, or generated internally. Intangible assets acquired through a business combination are recognized separately from goodwill when they are separable or arise from contractual or other legal rights, and their fair value can be measured reliably. The cost of a separately acquired intangible asset includes its purchase price and directly attributable costs of preparing the asset for its intended use. In respect of internally generated intangible assets, cost includes all directly attributable costs necessary to create, produce, and prepare the asset to be capable of operating in the manner intended by management. Research and development costs that are not eligible for capitalization are expensed. After initial recognition, an intangible asset is carried at its cost less any accumulated amortization and accumulated impairment losses, if any. Intangible assets with a finite-life are amortized on a straight-line basis over their estimated useful lives as follows: computer software – 3 to 10 years; and customer relationships – 10 to 20 years. We do not have any intangible assets with indefinite lives.

Intangible assets are assessed for indicators of impairment at each reporting period. If there is an indication that an intangible 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. If the recoverable amount of the asset (or CGU) is less than its carrying amount, the carrying amount of the intangible asset is written down to its recoverable amount as an impairment loss.

An impairment loss recognized previously is reversed if there is a change in the estimates used to determine the recoverable amount of the asset (or CGU) since the last impairment loss was recognized. If an impairment loss is subsequently reversed, the carrying amount of the asset (or CGU) is revised to the lower of its recoverable amount and the carrying amount that would have been determined (net of amortization) had there been no prior impairment.

Due to the subjective nature of these estimates, significant judgment is required in determining the useful lives and recoverable amounts of our intangible assets, and assessing whether certain events or circumstances constitute objective evidence of impairment. Estimates of the recoverable amounts of our intangible assets rely on certain key inputs, including future cash flows and discount rates. Future cash flows are based on sales projections and allocated costs which are estimated based on forecast results and business initiatives. Discount rates are based on the bank-wide cost of capital, adjusted for asset-specific risks. Changes in these assumptions may impact the amount of impairment loss recognized in Non-interest expense.

Other

Translation of foreign currencies

Monetary assets and liabilities denominated in foreign currencies are translated into Canadian dollars at rates prevailing at the balance sheet date. Foreign exchange gains and losses resulting from the translation and settlement of these items are recognized in Non-interest income in the Consolidated Statements of Income.

Non-monetary assets and liabilities that are measured at historical cost are translated into Canadian dollars at historical rates. Non-monetary financial assets classified as AFS securities, such as equity instruments, that are measured at fair value are translated into Canadian dollars at rates prevailing at the balance sheet date, and the resulting foreign exchange gains and losses are recorded in Other components of equity until the asset is sold or becomes impaired.

Assets and liabilities of our foreign operations with functional currencies other than Canadian dollars are translated into Canadian dollars at rates prevailing at the balance sheet date, and income and expenses of these foreign operations are translated at average rates of exchange for the reporting period.

Unrealized gains or losses arising as a result of the translation of our foreign operations along with the effective portion of related hedges are reported in Other components of equity on an after-tax basis. Upon disposal or partial disposal of a foreign operation, an appropriate portion of the accumulated net translation gains or losses is included in Non-interest income.

Premises and equipment

Premises and equipment includes land, buildings, leasehold improvements, computer equipment, furniture, fixtures and other equipment, and are stated at cost less accumulated depreciation, except for land which is not depreciated, and accumulated impairment losses. Cost comprises the purchase price, any costs directly attributable to bringing the asset to the location and condition necessary for its intended use, and the initial estimate of any disposal costs. Depreciation is recorded principally on a straight–line basis over the estimated useful lives of the assets, which are 25 to 50 years for buildings, 3 to 10 years for computer equipment, and 7 to 10 years for furniture, fixtures and other equipment. The amortization period for leasehold improvements is the lesser of the useful life of the leasehold improvements or the lease term plus the first renewal period, if reasonably assured of renewal, up to a maximum of 10 years. Depreciation methods, useful lives, and residual values are reassessed at each reporting period and adjusted as appropriate. Gains and losses on disposal are recorded in Non–interest income.

Premises and equipment are assessed for indicators of impairment at each reporting period. If there is an indication that an asset may be impaired, an impairment test is performed by comparing the asset's carrying amount 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 and test for impairment at the CGU level. An impairment charge is recorded to the extent the recoverable amount of an asset (or CGU), which is the higher of value in use and fair value less costs of disposal, is less than its carrying amount. Value in use is the present value of the future cash flows expected to be derived from the asset (or CGU). Fair value less costs of disposal is the amount obtainable from the sale of the asset (or CGU) in an orderly transaction between market participants, less costs of disposal.

After the recognition of impairment, the depreciation charge is adjusted in future periods to reflect the asset's revised carrying amount. If an impairment is later reversed, the carrying amount of the asset is revised to the lower of the asset's recoverable amount and the carrying amount that would have been determined (net of depreciation) had there been no prior impairment loss. The depreciation charge in future periods is adjusted to reflect the revised carrying amount.

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. 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. 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.

We are required to estimate the results of ongoing legal proceedings, expenses to be incurred to dispose of capital assets, and credit losses on undrawn commitments and guarantees. 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.

Commissions and fees

Portfolio management and other management advisory and service fees are recognized based on the applicable service contracts. Fees related to provision of services including asset management, wealth management, financial planning and custody services that cover a specified service period, are recognized over the period in which the service is provided. Investment management and custodial fees are generally calculated as a percentage of daily or period-end net asset values, and are received monthly, quarterly, semi-annually or annually, depending on the terms of the contracts. Management fees are generally derived from assets under management (AUM) when our clients solicit the investment capabilities of an investment manager and administrative fees are derived from assets under administration (AUA) where the investment strategy is directed by the client or a designated third party manager. Performance-based fees, which are earned upon exceeding certain benchmarks or performance targets, are recognized only when the benchmark or performance targets are achieved. Fees such as underwriting fees and brokerage fees that are related to the provision of specific transaction type services are recognized when the service has been completed.

Dividend income

Dividend income is recognized when the right to receive payment is established. This is the ex-dividend date for listed equity securities, and usually the date when shareholders have approved the dividend for unlisted equity securities.

Leasing

A lease is an agreement whereby the lessor conveys to the lessee the right to use an asset for an agreed upon period of time in return for a payment or series of payments. A finance lease is a lease that transfers substantially all the risks and rewards incidental to ownership of the leased asset to the lessee, where title may or may not eventually be transferred. An operating lease is a lease other than a finance lease.

Operating leases

When we are the lessee in an operating lease, we record rental payments on a straight-line basis over the lease term in Non-interest expense.

Finance leases

When we are the lessee in a finance lease, we initially record both the leased asset and the related lease obligation in Premises and equipment, Other intangibles and Other liabilities on our Consolidated Balance Sheets at an amount equal to the fair value of the leased asset or, if lower, the present value of the minimum lease payments, each determined at the date of inception of the lease. Initial direct costs directly attributed to the lease are recognized as an asset under the finance lease.

Earnings per share

Earnings per share is computed by dividing Net income available to common shareholders by the weighted average number of common shares outstanding for the period. Net income available to common shareholders is determined after deducting dividend entitlements of preferred shareholders, any gains (losses) on redemption of preferred shares net of related income taxes and the net income attributable to non-controlling interests.

Diluted earnings per share reflects the potential dilution that could occur if additional common shares are assumed to be issued under securities or contracts that entitle their holders to obtain common shares in the future, to the extent such entitlement is not subject to unresolved contingencies. For contracts that may be settled in cash or in common shares at our option, diluted earnings per share is calculated based on the assumption that such contracts will be settled in shares. Income and expenses associated with these types of contracts are excluded from the Net income available to common shareholders, and the additional number of shares that would be issued is included in the diluted earnings per share calculation. These contracts include our convertible Preferred Shares and Trust Capital Securities with the conversion assumed to have taken place at the beginning of the period or on the date of issue, if later. For stock options whose exercise price is less than the average market price of our common shares, they are assumed to be exercised and the proceeds are used to repurchase common shares at the average market price for the period. The incremental number of common shares issued under stock options and repurchased from proceeds is included in the calculation of diluted earnings per share.

Share capital

We classify a financial instrument that we issue as a financial asset, financial liability or an equity instrument in accordance with the substance of the contractual arrangement.

Our common shares held by us are classified as treasury shares in equity and accounted for at weighted average cost. Upon the sale of treasury shares, the difference between the sale proceeds and the cost of the shares is recognized in Retained earnings. Financial instruments issued by us are classified as equity instruments when there is no contractual obligation to transfer cash or other financial assets. Incremental costs directly attributable to the issue of equity instruments are included in equity as a deduction from the proceeds, net of tax. Financial instruments that will be settled by a variable number of our common shares upon their conversion by the holders as well as the related accrued distributions are classified as liabilities on our Consolidated Balance Sheets. Dividends and yield distributions on these instruments are classified as Interest expense in our Consolidated Statements of Income.

Future changes in accounting policy and disclosure

The following standards have been issued, but are not yet effective for us. We are currently assessing the impact of adopting these standards on our Consolidated Financial Statements:

IFRS 15 *Revenue from Contracts with Customers* (IFRS 15)

In May 2014, the IASB issued IFRS 15 which establishes 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. 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.

IFRS 9 *Financial Instruments* (IFRS 9)

In July 2014, the IASB issued the complete version of IFRS 9, first issued in November 2009, 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).

IFRS 9 introduces a principles-based approach to the classification of financial assets based on an entity's business model and the nature of the cash flows of the asset. All financial assets, including hybrid contracts, are measured as at FVTPL, fair value through OCI or amortized cost. For financial liabilities, IFRS 9 includes the requirements for classification and measurement previously included in IAS 39.

IFRS 9 also introduces an expected credit loss impairment model for all financial assets not measured as at FVTPL. The model has three stages: (1) on initial recognition, a loss allowance is recognized equal to 12 months expected credit losses; (2) if credit risk increases significantly relative to initial recognition, a loss allowance equal to full lifetime expected credit losses is recognized; and (3) when a financial asset is considered credit-impaired, a loss allowance equal to lifetime expected credit losses is recognized and interest revenue is calculated based on the carrying amount of the asset, net of the loss allowance, rather than its gross carrying amount. Changes in the required loss allowance, including the impact of movement between 12 months and lifetime expected credit losses, will be recorded in profit or loss.

Finally, IFRS 9 introduces a new hedge accounting model that aligns the accounting for hedge relationships more closely with an entity's risk management activities, permits hedge accounting to be applied more broadly to a greater variety of hedging instruments and risks and requires additional disclosures.

We adopted the own credit provisions of IFRS 9 in the second quarter of 2014. The remaining sections of IFRS 9 will be effective for us on November 1, 2017.

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 flow. These amendments will be effective for us on November 1, 2017.

Note 3 Fair value of financial instruments

Carrying value and fair value of selected financial instruments

The following tables provide a comparison of the carrying and fair values for each classification of financial instrument.

	As at October 31, 2016						
	Carrying value and fair value			Carrying value	Fair value		
(Millions of Canadian dollars)	Financial instruments classified as at FVTPL	Financial instruments designated as at FVTPL	Available-for-sale instruments measured at fair value	Financial instruments measured at amortized cost	Financial instruments measured at amortized cost	Total carrying amount	Total fair value
Financial assets							
Securities							
Trading	$ 141,265	$ 10,027	$ –	$ –	$ –	$151,292	$ 151,292
Available-for-sale (1)	–	–	69,922	14,879	15,207	84,801	85,129
	141,265	10,027	69,922	14,879	15,207	236,093	236,421
Assets purchased under reverse repurchase agreements and securities borrowed	–	121,692	–	64,610	64,498	186,302	186,190
Loans							
Retail	71	–	–	368,145	369,012	368,216	369,083
Wholesale	1,437	904	–	151,047	150,720	153,388	153,061
	1,508	904	–	519,192	519,732	521,604	522,144
Other							
Derivatives	118,944	–	–	–	–	118,944	118,944
Other assets (2)	–	894	–	43,981	43,979	44,875	44,873
Financial liabilities							
Deposits							
Personal	$ 113	$ 15,142		$ 235,295	$ 235,490	$250,550	$ 250,745
Business and government (3)	–	82,871		405,136	406,881	488,007	489,752
Bank (4)	–	730		18,302	18,312	19,032	19,042
	113	98,743		658,733	660,683	757,589	759,539
Other							
Obligations related to securities sold short	50,369	–		–	–	50,369	50,369
Obligations related to assets sold under repurchase agreements and securities loaned	–	88,863		14,578	14,583	103,441	103,446
Derivatives	116,550	–		–	–	116,550	116,550
Other liabilities (5)	282	10		43,865	43,838	44,157	44,130
Subordinated debentures	–	131		9,631	9,700	9,762	9,831

	As at October 31, 2015						
	Carrying value and fair value			Carrying value	Fair value		
(Millions of Canadian dollars)	Financial instruments classified as at FVTPL	Financial instruments designated as at FVTPL	Available-for-sale instruments measured at fair value	Financial instruments measured at amortized cost	Financial instruments measured at amortized cost	Total carrying amount	Total fair value
Financial assets							
Securities							
Trading	$ 148,939	$ 9,764	$ –	$ –	$ –	$ 158,703	$ 158,703
Available-for-sale (1)	–	–	48,164	8,641	8,759	56,805	56,923
	148,939	9,764	48,164	8,641	8,759	215,508	215,626
Assets purchased under reverse repurchase agreements and securities borrowed	–	114,692	–	60,031	60,071	174,723	174,763
Loans							
Retail	166	–	–	346,795	348,513	346,961	348,679
Wholesale	1,280	1,327	–	122,655	121,316	125,262	123,923
	1,446	1,327	–	469,450	469,829	472,223	472,602
Other							
Derivatives	105,626	–	–	–	–	105,626	105,626
Other assets (2)	–	925	–	44,852	44,852	45,777	45,777
Financial liabilities							
Deposits							
Personal	$ 69	$ 16,828		$ 203,669	$ 204,019	$ 220,566	$ 220,916
Business and government (3)	–	93,319		362,259	363,305	455,578	456,624
Bank (4)	–	5,376		15,707	15,713	21,083	21,089
	69	115,523		581,635	583,037	697,227	698,629
Other							
Obligations related to securities sold short	47,658	–		–	–	47,658	47,658
Obligations related to assets sold under repurchase agreements and securities loaned	–	73,362		9,926	9,928	83,288	83,290
Derivatives	107,860	–		–	–	107,860	107,860
Other liabilities (5)	192	13		43,251	43,196	43,456	43,401
Subordinated debentures	–	112		7,250	7,078	7,362	7,190

(1) AFS securities include held-to-maturity securities that are recorded at amortized cost.
(2) Includes Customers' liability under acceptances and financial instruments recognized in Other assets.
(3) Business and government deposits include deposits from regulated deposit-taking institutions other than banks.
(4) Bank deposits refer to deposits from regulated deposit-taking institutions.
(5) Includes Acceptances and financial instruments recognized in Other liabilities.

Loans and receivables designated as at fair value through profit or loss

For our loans and receivables designated as at FVTPL, we measure the change in fair value attributable to changes in credit risk as the difference between the total change in the fair value of the instrument during the period and the change in fair value calculated using the appropriate risk-free yield curves.

	As at			
	October 31, 2016		October 31, 2015	
(Millions of Canadian dollars)	**Carrying amount of loans and receivables designated as at FVTPL**	**Maximum exposure to credit risk**	Carrying amount of loans and receivables designated as at FVTPL	Maximum exposure to credit risk
Interest-bearing deposits with banks	**$ 15,967**	**$ 15,967**	$ 15,717	$ 15,717
Assets purchased under reverse repurchase agreements and securities borrowed	**121,692**	**121,692**	114,692	114,692
Loans – Wholesale	**904**	**904**	1,327	1,327
Other assets	**132**	**132**	202	202
	$ 138,695	**$ 138,695**	$ 131,938	$ 131,938

There were no significant changes in the fair value of the loans and receivables designated as at FVTPL attributable to changes in credit risk during the years ended October 31, 2016 and October 31, 2015, and cumulatively since initial recognition of the assets. The extent to which credit derivatives or similar instruments mitigate the maximum exposure to credit risk is nominal as at October 31, 2016 and October 31, 2015.

Liabilities designated as at fair value through profit or loss

For our financial liabilities designated as at FVTPL, we take into account changes in our own credit spread and the expected duration of the instrument to measure the change in fair value attributable to changes in credit risk.

	As at or for the year ended October 31, 2016					
(Millions of Canadian dollars)	**Contractual maturity amount**	**Carrying value**	**Difference between carrying value and contractual maturity amount**	**Changes in fair value attributable to changes in credit risk included in net income for positions still held**	**Changes in fair value attributable to changes in credit risk included in OCI for positions still held**	**Cumulative change in fair value attributable to changes in credit risk for positions still held** (1)
Term deposits						
Personal	**$ 15,138**	**$ 15,142**	**$ 4**	**$ –**	**$ 99**	**$ 25**
Business and government (2)	**81,860**	**82,871**	**1,011**	**–**	**354**	**25**
Bank (3)	**730**	**730**	**–**	**–**	**–**	**–**
	97,728	**98,743**	**1,015**	**–**	**453**	**50**
Obligations related to assets sold under repurchase agreements and securities loaned	**88,863**	**88,863**	**–**	**–**	**–**	**–**
Other liabilities	**10**	**10**	**–**	**–**	**–**	**–**
Subordinated debentures	**128**	**131**	**3**	**–**	**1**	**(2)**
	$ 186,729	**$187,747**	**$ 1,018**	**$ –**	**$ 454**	**$ 48**

	As at or for the year ended October 31, 2015					
(Millions of Canadian dollars)	Contractual maturity amount	Carrying value	Difference between carrying value and contractual maturity amount	Changes in fair value attributable to changes in credit risk included in net income for positions still held	Changes in fair value attributable to changes in credit risk included in OCI for positions still held	Cumulative change in fair value attributable to changes in credit risk for positions still held (1)
Term deposits						
Personal	$ 16,595	$ 16,828	$ 233	$ –	$ (93)	$ (74)
Business and government (2)	93,225	93,319	94	–	(387)	(329)
Bank (3)	5,376	5,376	–	–	–	–
	115,196	115,523	327	–	(480)	(403)
Obligations related to assets sold under repurchase agreements and securities loaned	73,364	73,362	(2)	–	–	–
Other liabilities	13	13	–	–	–	–
Subordinated debentures	108	112	4	–	–	(3)
	$ 188,681	$189,010	$ 329	$ –	$ (480)	$ (406)

(1) The cumulative change is measured from the initial recognition of the liabilities designated as at FVTPL. For the year ended October 31, 2016, $14 million of fair value gains previously included in OCI relate to financial liabilities derecognized during the year (October 31, 2015 – $3 million fair value losses).
(2) Business and government term deposits include deposits from regulated deposit-taking institutions other than regulated banks.
(3) Bank term deposits refer to deposits from regulated deposit-taking institutions.

Fair value of assets and liabilities measured at fair value on a recurring basis and classified using the fair value hierarchy

(Millions of Canadian dollars)	As at October 31, 2016						As at October 31, 2015					
	Fair value measurements using			Total gross fair value	Netting adjustments	Assets/ liabilities at fair value	Fair value measurements using			Total gross fair value	Netting adjustments	Assets/ liabilities at fair value
	Level 1	Level 2	Level 3				Level 1	Level 2	Level 3			
Financial assets												
Interest-bearing deposits with banks	$ –	$ 15,967	$ –	$ 15,967	$	$ 15,967	$ –	$ 15,717	$ –	$ 15,717	$	$ 15,717
Securities												
Trading												
Canadian government debt (1)												
Federal	13,072	10,214	–	23,286		23,286	10,793	9,364	–	20,157		20,157
Provincial and municipal	–	11,928	–	11,928		11,928	–	13,888	5	13,893		13,893
U.S. state, municipal and agencies debt (1)	3,358	37,002	1	40,361		40,361	1,641	32,798	16	34,455		34,455
Other OECD government debt (2)	1,390	5,530	–	6,920		6,920	3,131	9,215	–	12,346		12,346
Mortgage-backed securities (1)	–	1,457	–	1,457		1,457	–	2,907	15	2,922		2,922
Asset-backed securities												
CDO (3)	–	–	–	–		–	–	67	5	72		72
Non-CDO securities	–	557	4	561		561	–	1,636	23	1,659		1,659
Corporate debt and other debt	25	20,630	62	20,717		20,717	16	24,502	191	24,709		24,709
Equities	43,155	2,531	376	46,062		46,062	45,811	2,556	123	48,490		48,490
	61,000	89,849	443	151,292		151,292	61,392	96,933	378	158,703		158,703
Available-for-sale (4)												
Canadian government debt (1)												
Federal	44	378	–	422		422	346	2,198	–	2,544		2,544
Provincial and municipal	–	2,364	–	2,364		2,364	–	1,600	–	1,600		1,600
U.S. state, municipal and agencies debt (1)	1	24,668	747	25,416		25,416	–	12,051	797	12,848		12,848
Other OECD government debt	3,416	10,484	–	13,900		13,900	4,752	7,535	–	12,287		12,287
Mortgage-backed securities (1)	–	395	–	395		395	–	318	–	318		318
Asset-backed securities												
CDO	–	1,630	–	1,630		1,630	–	1,510	–	1,510		1,510
Non-CDO securities	–	1,886	217	2,103		2,103	–	881	197	1,078		1,078
Corporate debt and other debt	–	21,110	956	22,066		22,066	–	12,372	1,757	14,129		14,129
Equities	376	331	756	1,463		1,463	431	323	987	1,741		1,741
Loan substitute securities	49	25	–	74		74	94	–	–	94		94
	3,886	63,271	2,676	69,833		69,833	5,623	38,788	3,738	48,149		48,149
Assets purchased under reverse repurchase agreements and securities borrowed	–	121,692	–	121,692		121,692	–	114,692	–	114,692		114,692
Loans	–	2,083	329	2,412		2,412	–	2,301	472	2,773		2,773
Other												
Derivatives												
Interest rate contracts	3	153,216	555	153,774		153,774	7	142,096	374	142,477		142,477
Foreign exchange contracts	–	56,752	26	56,778		56,778	–	41,021	91	41,112		41,112
Credit derivatives	–	191	–	191		191	–	90	4	94		94
Other contracts	2,855	3,613	307	6,775		6,775	4,424	5,637	712	10,773		10,773
Valuation adjustments	–	(1,429)	(3)	(1,432)		(1,432)	–	(1,265)	(38)	(1,303)		(1,303)
Total gross derivatives	2,858	212,343	885	216,086		216,086	4,431	187,579	1,143	193,153		193,153
Netting adjustments					(97,142)	(97,142)					(87,527)	(87,527)
Total derivatives						118,944						105,626
Other assets	762	132	–	894		894	723	202	–	925		925
	$ 68,506	$ 505,337	$ 4,333	$ 578,176	$ (97,142)	$ 481,034	$ 72,169	$ 456,212	$ 5,731	$ 534,112	$ (87,527)	$ 446,585
Financial Liabilities												
Deposits												
Personal	$ –	$ 14,830	$ 425	$ 15,255	$	$ 15,255	$ –	$ 16,508	$ 389	$ 16,897	$	$ 16,897
Business and government	–	82,869	2	82,871		82,871	–	93,311	8	93,319		93,319
Bank	–	730	–	730		730	–	5,376	–	5,376		5,376
Other												
Obligations related to securities sold short	32,672	17,696	1	50,369		50,369	31,945	15,713	–	47,658		47,658
Obligations related to assets sold under repurchase agreements and securities loaned	–	88,863	–	88,863		88,863	–	73,362	–	73,362		73,362
Derivatives												
Interest rate contracts	–	145,055	1,003	146,058		146,058	3	135,455	820	136,278		136,278
Foreign exchange contracts	–	57,438	41	57,479		57,479	–	46,675	33	46,708		46,708
Credit derivatives	–	263	–	263		263	–	166	5	171		171
Other contracts	3,135	5,543	429	9,107		9,107	3,835	8,075	1,025	12,935		12,935
Valuation adjustments	–	(133)	7	(126)		(126)	–	(281)	9	(272)		(272)
Total gross derivatives	3,135	208,166	1,480	212,781		212,781	3,838	190,090	1,892	195,820		195,820
Netting adjustments					(96,231)	(96,231)					(87,960)	(87,960)
Total derivatives						116,550						107,860
Other liabilities	124	80	88	292		292	145	13	47	205		205
Subordinated debentures	–	131	–	131		131	–	112	–	112		112
	$ 35,931	$ 413,365	$ 1,996	$ 451,292	$ (96,231)	$ 355,061	$ 35,928	$ 394,485	$ 2,336	$ 432,749	$ (87,960)	$ 344,789

(1) As at October 31, 2016, residential and commercial mortgage-backed securities (MBS) included in all fair value levels of trading securities were $14,987 million and $10 million (October 31, 2015 – $10,315 million and $137 million), respectively, and in all fair value levels of AFS securities were $13,212 million and $346 million (October 31, 2015 – $3,394 million and $242 million), respectively.
(2) OECD stands for Organisation for Economic Co-operation and Development.
(3) CDO stands for collateralized debt obligations.
(4) Excludes $89 million of AFS securities (October 31, 2015 – $15 million) that are carried at cost.

Fair values of our significant assets and liabilities measured on a recurring basis are determined and classified in the fair value hierarchy table using the following valuation techniques and inputs.

Interest-bearing deposits with banks
A majority of our deposits with banks are designated as at FVTPL. These FVTPL deposits are composed of short-dated deposits placed with banks, and are included in Interest-bearing deposits with banks in the fair value hierarchy table. The fair values of these instruments are determined using the discounted cash flow method. The inputs to the valuation models include interest rate swap curves and credit spreads, where applicable. They are classified as Level 2 instruments in the hierarchy as the inputs are observable.

Government bonds (Canadian, U.S. and other OECD governments)
Government bonds are included in Canadian government debt, U.S. state, municipal and agencies debt, Other OECD government debt and Obligations related to securities sold short in the fair value hierarchy table. The fair values of government issued or guaranteed debt securities in active markets are determined by reference to recent transaction prices, broker quotes, or third-party vendor prices and are classified as Level 1 in the hierarchy. The fair values of securities that are not traded in active markets are based on either security prices, or valuation techniques using implied yields and risk spreads derived from prices of actively traded and similar government securities. Securities with observable prices or rate inputs as compared to transaction prices, dealer quotes or vendor prices are classified as Level 2 in the hierarchy. Securities where inputs are unobservable are classified as Level 3 in the hierarchy.

Corporate and U.S. municipal bonds
The fair values of corporate and U.S. municipal bonds, which are included in Corporate debt and other debt, U.S. state, municipal and agencies debt and Obligations related to securities sold short in the fair value hierarchy table, are determined using either recently executed transaction prices, broker quotes, pricing services, or in certain instances, the discounted cash flow method using rate inputs such as benchmark yields (Canadian Dealer Offered Rate, LIBOR and other similar reference rates) and risk spreads of comparable securities. Securities with observable prices or rate inputs are classified as Level 2 in the hierarchy. Securities where inputs are unobservable are classified as Level 3 in the hierarchy.

Asset-backed securities and Mortgage-backed securities
Asset-backed securities (ABS) and MBS are included in Asset-backed securities, Mortgage-backed securities, Canadian government debt, U.S. state, municipal and agencies debt, and Obligations related to securities sold short in the fair value hierarchy table. ABS include collateralized debt obligations (CDO). Inputs for valuation of MBS and CDO are, when available, traded prices, dealer or lead manager quotes, broker quotes and vendor prices of the identical securities. When prices of the identical securities are not readily available, we use industry standard models with inputs such as discount margins, yields, default, prepayment and loss severity rates that are implied from transaction prices, dealer quotes or vendor prices of comparable instruments. Where security prices and inputs are observable, ABS and MBS are classified as Level 2 in the hierarchy. Otherwise, they are classified as Level 3 in the hierarchy.

Auction rate securities
Auction rate securities (ARS) are included in U.S. state, municipal and agencies debt, and Asset-backed securities in the fair value hierarchy table. The valuation of ARS involves discounting forecasted cash flows from the underlying student loan collateral and incorporating multiple inputs such as default, prepayment, deferment and redemption rates, and credit spreads. These inputs are unobservable, and therefore, ARS are classified as Level 3 in the hierarchy. All relevant data must be assessed and significant judgment is required to determine the appropriate valuation inputs.

Equities
Equities and Obligations related to securities sold short in the fair value hierarchy table consist of listed and unlisted common shares, private equities and hedge funds with certain redemption restrictions. The fair values of common shares are based on quoted prices in active markets, where available, and are classified as Level 1 in the hierarchy. Where quoted prices in active markets are not readily available, fair value is determined based on quoted market prices for similar securities or through valuation techniques, such as multiples of earnings and the discounted cash flow method with forecasted cash flows and discount rate as inputs. Private equities are classified as Level 3 in the hierarchy as their inputs are not observable. Hedge funds are valued using Net Asset Values (NAV). If we can redeem a hedge fund at NAV prior to the next quarter end, the fund is classified as Level 2 in the hierarchy. Otherwise, it is classified as Level 3 in the hierarchy.

Derivatives
The fair values of exchange-traded derivatives, such as interest rate and equity options and futures, are based on quoted market prices and are classified as Level 1 in the hierarchy. OTC derivatives primarily consist of interest rate and cross currency swaps, interest rate options, foreign exchange forward contracts and options, and commodity options and swaps. The exchange-traded or OTC interest rate, foreign exchange and equity derivatives are included in Interest rate contracts, Foreign exchange contracts and Other contracts, respectively, in the fair value hierarchy table. The fair values of OTC derivatives are determined using valuation models when quoted market prices or third-party consensus pricing information are not available. The valuation models, such as discounted cash flow method or Black-Scholes option model, incorporate observable or unobservable inputs for interest and foreign exchange rates, equity and commodity prices (including indices), credit spreads, corresponding market volatility levels, and other market-based pricing factors. Other adjustments to fair value include bid-offer, CVA, FVA, OIS, parameter and model uncertainties, and unrealized gain or loss at inception of a transaction. A derivative instrument is classified as Level 2 in the hierarchy if observable market inputs are available or the unobservable inputs are not significant to the fair value. Otherwise, it is classified as Level 3 in the hierarchy.

Securities borrowed or purchased under resale agreements and securities loaned or sold under repurchase agreements
In the fair value hierarchy table, these instruments are included in Assets purchased under reverse repurchase agreements and securities borrowed, and Obligations related to assets sold under repurchase agreements and securities loaned. The fair values of these contracts are determined using valuation techniques such as the discounted cash flow method using interest rate curves as inputs. They are classified as Level 2 instruments in the hierarchy as the inputs are observable.

Deposits
A majority of our deposits are measured at amortized cost but certain deposits are designated as at FVTPL. These FVTPL deposits include deposits taken from clients, the issuance of certificates of deposits and promissory notes, and interest rate and equity linked notes, and are included in Deposits in the fair value hierarchy table. The fair values of these instruments are determined using the discounted cash flow method and derivative option valuation models. The inputs to the valuation models include benchmark yield curves, credit spreads, interest rates, equity and interest rate volatility, dividends and correlation, where applicable. They are classified as Level 2 or 3 instruments in the hierarchy, depending on the significance of the unobservable credit spreads, volatility, dividend and correlation rates.

Quantitative information about fair value measurements using significant unobservable inputs (Level 3 Instruments)
The following table presents fair values of our significant Level 3 financial instruments, valuation techniques used to determine their fair values, ranges and weighted averages of unobservable inputs.

As at October 31, 2016 (Millions of Canadian dollars, except for prices, percentages and ratios)

		Fair value				Range of input values (2), (3)		
Products	Reporting line in the fair value hierarchy table	Assets	Liabilities	Valuation techniques	Significant unobservable inputs (1)	Low	High	Weighted average / Inputs distribution (4)
Non-derivative financial instruments								
Asset-backed securities				Price-based	Prices	100.06	100.19	100.12
	Asset-backed securities	$ 28	$	Discounted cash flows	Discount margins	n.a.	n.a.	n.a.
					Yields	2.44%	2.44%	2.44%
					Default rates	n.a.	n.a.	n.a.
					Prepayment rates	n.a.	n.a.	n.a.
					Loss severity rates	n.a.	n.a.	n.a.
Auction rate securities				Discounted cash flows	Discount margins	1.57%	3.75%	2.43%
	U.S. state, municipal and agencies debt	717			Default rates	3.00%	9.30%	3.02%
	Asset-backed securities	193			Prepayment rates	4.00%	10.00%	4.44%
					Recovery rates	40.00%	97.50%	92.37%
Corporate debt				Price-based	Prices	$ 20.00	$ 127.54	$ 111.93
	Corporate debt and other debt	98		Discounted cash flows	Yields	5.25%	8.85%	7.39%
	Loans	329			Capitalization rates	5.99%	8.35%	7.17%
					Credit Spread	1.51%	12.54%	7.02%
	Obligations related to securities sold short		1		Credit enhancement	12.04%	16.05%	14.04%
Government debt and municipal bonds				Price-based	Prices	$ 60.00	$ 99.79	$ 63.30
	Canadian government debt	–		Discounted cash flows	Yields	1.48%	20.92%	4.16%
	U.S. state, municipal and agencies debt	31						
	Corporate debt and other debt	920						
Private equities, hedge fund investments and related equity derivatives	Equities	1,132		Market comparable	EV/EBITDA multiples	6.94X	15.50X	9.65X
				Price-based	P/E multiples	12.12X	23.25X	14.45X
	Derivative-related assets	77		Discounted cash flows	EV/Rev multiples	0.30X	5.90X	3.42X
	Derivative-related liabilities		168		Liquidity discounts (5)	15.00%	40.00%	29.21%
					Discount rate	12.00%	17.00%	16.53%
					Net asset values / prices (6)	n.a.	n.a.	n.a.
Derivative financial instruments								
Interest rate derivatives and interest-rate-linked structured notes (7)		566		Discounted cash flows	Interest rates	1.79%	2.43%	Even
	Derivative-related assets				CPI swap rates	1.49%	1.97%	Even
	Derivative-related liabilities		1,014	Option pricing model				
					IR-IR correlations	19.00%	67.00%	Even
					FX-IR correlations	29.00%	56.00%	Even
					FX-FX correlations	68.00%	68.00%	Even
					IR volatilities	n.a.	n.a.	n.a.
Equity derivatives and equity-linked structured notes (7)				Discounted cash flows	Dividend yields	0.04%	20.64%	Lower
	Derivative-related assets	217		Option pricing model	Equity (EQ)-EQ correlations	13.90%	97.40%	Middle
	Deposits		425		EQ-FX correlations	(71.40)%	32.40%	Middle
	Derivative-related liabilities		242		EQ volatilities	3.00%	118.00%	Lower
Other (8)								
	Mortgage-backed securities	–						
	Derivative-related assets	25						
	Deposits		2					
	Derivative-related liabilities		56					
	Other liabilities		88					
Total		$ 4,333	$ 1,996					

As at October 31, 2015 (Millions of Canadian dollars, except for prices, percentages and ratios)

Products	Reporting line in the fair value hierarchy table	Fair value Assets	Fair value Liabilities	Valuation techniques	Significant unobservable inputs (1)	Range of input values (2), (3) Low	High	Weighted average / Inputs distribution (4)
Non-derivative financial instruments								
Asset-backed securities				Price-based	Prices	n.a.	n.a.	n.a.
	Asset-backed securities	$ 48	$	Discounted cash flows	Discount margins	3.43%	13.10%	8.27%
					Yields	1.39%	2.78%	1.79%
					Default rates	–%	5.00%	2.50%
					Prepayment rates	–%	30.00%	15.00%
					Loss severity rates	20.00%	70.00%	45.00%
Auction rate securities				Discounted cash flows	Discount margins	1.65%	4.50%	2.78%
	U.S. state, municipal and agencies debt	699			Default rates	9.00%	10.00%	9.96%
	Asset-backed securities	177			Prepayment rates	4.00%	8.00%	4.35%
					Recovery rates	40.00%	97.50%	91.66%
Corporate debt				Price-based	Prices	$ 47.61	$ 164.29	$ 96.57
	Corporate debt and other debt	198		Discounted cash flows	Yields	2.98%	8.00%	3.89%
	Loans	472			Capitalization rates	6.07%	8.50%	7.28%
					Credit Spread	n.a.	n.a.	n.a.
	Obligations related to securities sold short		–		Credit enhancement	n.a.	n.a.	n.a.
Government debt and municipal bonds				Price-based	Prices	$ 64.98	$ 126.22	$ 84.50
	Canadian government debt	5		Discounted cash flows	Yields	0.27%	31.37%	3.89%
	U.S. state, municipal and agencies debt	114						
	Corporate debt and other debt	1,750						
Private equities, hedge fund investments and related equity derivatives				Market comparable	EV/EBITDA multiples	4.67X	15.50X	7.38X
	Equities	1,110		Price-based	P/E multiples	9.40X	22.40X	12.14X
	Derivative-related assets	3		Discounted cash flows	EV/Rev multiples	0.28X	5.90X	2.64X
	Derivative-related liabilities		218		Liquidity discounts (5)	15.00%	40.00%	27.34%
					Discount rate	12.00%	17.00%	16.46%
					Net asset values / prices (6)	n.a.	n.a.	n.a.
Derivative financial instruments								
Interest rate derivatives and interest-rate-linked structured notes (7)				Discounted cash flows	Interest rates	2.25%	2.27%	Even
	Derivative-related assets	428			CPI swap rates	1.67%	1.90%	Even
	Derivative-related liabilities		822	Option pricing model	IR-IR correlations	19.00%	67.00%	Even
					FX-IR correlations	29.00%	56.00%	Even
					FX-FX correlations	68.00%	68.00%	Even
					IR volatilities	0.11%	6.11%	Middle
Equity derivatives and equity-linked structured notes (7)				Discounted cash flows	Dividend yields	0.01%	29.09%	Lower
	Derivative-related assets	559		Option pricing model	Equity (EQ)-EQ correlations	13.90%	96.90%	Middle
	Deposits		389		EQ-FX correlations	(69.10)%	29.20%	Middle
	Derivative-related liabilities		569		EQ volatilities	1.70%	190.00%	Lower
Other (8)								
	Mortgage-backed securities	15						
	Derivative-related assets	153						
	Deposits		8					
	Derivative-related liabilities		283					
	Other liabilities		47					
Total		$5,731	$ 2,336					

(1) The acronyms stand for the following: (i) Enterprise Value (EV); (ii) Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA); (iii) Price / Earnings (P/E); (iv) Revenue (Rev); and (v) Consumer Price Index (CPI).
(2) The low and high input values represent the actual highest and lowest level inputs used to value a group of financial instruments in a particular product category. These input ranges do not reflect the level of input uncertainty, but are affected by the different underlying instruments within the product category. The input ranges will therefore vary from period to period based on the characteristics of the underlying instruments held at each balance sheet date. Where provided, the weighted average of the input values is calculated based on the relative fair values of the instruments within the product category. The weighted averages for derivatives are not presented in the table as they would not provide a comparable metric; instead, distribution of significant unobservable inputs within the range for each product category is indicated in the table.
(3) Price-based inputs are significant for certain debt securities and are based on external benchmarks, comparable proxy instruments or pre-quarter-end trade data. For these instruments, the price input is expressed in dollars for each $100 par value. For example, with an input price of $105, an instrument is valued at a premium over its par value.
(4) The level of aggregation and diversity within each derivative instrument category may result in certain ranges of inputs being wide and inputs being unevenly distributed across the range. In the table, we indicated whether the majority of the inputs are concentrated toward the upper, middle, or lower end of the range, or evenly distributed throughout the range.
(5) Fair value of securities with liquidity discount inputs totalled $127 million (October 31, 2015 – $131 million).
(6) NAV of a hedge fund is total fair value of assets less liabilities divided by the number of fund units. The NAV of the funds and the corresponding equity derivatives referenced to NAV are not considered observable as we cannot redeem certain of these hedge funds at NAV prior to the next quarter end. Private equities are valued based on NAV or valuation techniques. The range for NAV per unit or price per share has not been disclosed for the hedge funds or private equities due to the dispersion of prices given the diverse nature of the investments.
(7) The structured notes contain embedded equity or interest rate derivatives with unobservable inputs that are similar to those of the equity or interest rate derivatives.
(8) Other primarily includes certain insignificant instruments such as commodity derivatives, foreign exchange derivatives, credit derivatives, bank-owned life insurance and Bank funding and deposits.
n.a. not applicable

Sensitivity to unobservable inputs and interrelationships between unobservable inputs

Yield, credit spreads/discount margins

A financial instrument's yield is the interest rate used to discount future cash flows in a valuation model. An increase in the yield, in isolation, would result in a decrease in a fair value measurement and vice versa. A credit spread/discount margin is the difference between a debt instrument's yield and a benchmark instrument's yield. Benchmark instruments have high credit quality ratings, similar maturities and are often government bonds. The credit spread/discount margin therefore represents the discount rate used to determine the present value of future cash flows of an asset to reflect the market return required for uncertainty in the estimated cash flows. The credit spread/discount margin for an instrument forms part of the yield used in a discounted cash flow method. Generally, an increase in the credit spread or discount margin will result in a decrease in fair value, and vice versa.

Funding spread
Funding spreads are credit spreads specific to our funding or deposit rates. A decrease in funding spreads, on its own, will increase fair value of our liabilities, and vice versa.

Default rates
A default rate is the rate at which borrowers fail to make scheduled loan payments. A decrease in the default rate will typically increase the fair value of the loan, and vice versa. This effect will be significantly more pronounced for a non-government guaranteed loan than a government guaranteed loan.

Prepayment rates
A prepayment rate is the rate at which a loan will be repaid in advance of its expected amortization schedule. Prepayments change the future cash flows of a loan. An increase in the prepayment rate in isolation will result in an increase in fair value when the loan interest rate is lower than the then current reinvestment rate, and a decrease in the prepayment rate in isolation will result in a decrease in fair value when the loan interest rate is lower than the then current reinvestment rate. Prepayment rates are generally negatively correlated with interest rates.

Recovery and loss severity rates
A recovery rate is an estimation of the amount that can be collected in a loan default scenario. The recovery rate is the recovered amount divided by the loan balance due, expressed as a percentage. The inverse concept of recovery is loss severity. Loss severity rate is an estimation of the loan amount not collected when a loan defaults. The loss severity rate is the loss amount divided by the loan balance due, expressed as a percentage. Generally, an increase in the recovery rate or a decrease in the loss severity rate will increase the loan fair value, and vice versa.

Capitalization rates
A capitalization rate is a rate of return on a real estate property investment calculated by dividing a property's income by the property's value. A lower capitalization rate increases the property value, and vice versa.

Volatility rates
Volatility measures the potential variability of future prices and is often measured as the standard deviation of price movements. Volatility is an input to option pricing models used to value derivatives and issued structured notes. Volatility is used in valuing equity, interest rate, commodity and foreign exchange options. A higher volatility rate means that the underlying price or rate movements are more likely to occur. Higher volatility rates may increase or decrease an option's fair value depending on the option's terms. The determination of volatility rates is dependent on various factors, including but not limited to, the underlying's market price, the strike price and maturity.

Dividend yields
A dividend yield is the underlying equity's expected dividends expressed as an annual percentage of its price. Dividend yield is used as an input for forward equity price and option models. Higher dividend yields will decrease the forward price, and vice versa. A higher dividend yield will increase or decrease an option's value, depending on the option's terms.

Correlation rates
Correlation is the linear relationship between the movements in two different variables. Correlation is an input to the valuation of derivative contracts and issued structured notes when an instrument's payout is determined by correlated variables. When variables are positively correlated, an increase in one variable will result in an increase in the other variable. When variables are negatively correlated, an increase in one variable will result in a decrease in the other variable. The referenced variables can be within a single asset class or market (equity, interest rate, commodities, credit and foreign exchange) or between variables in different asset classes (equity to foreign exchange, or interest rate to foreign exchange). Changes in correlation will either increase or decrease a financial instrument's fair value depending on the terms of its contractual payout.

Interest rates
An interest rate is the percentage amount charged on a principal or notional amount. Increasing interest rates will decrease the discounted cash flow value of a financial instrument, and vice versa.

Consumer Price Index swap rates
A CPI swap rate is expressed as a percentage of an increase in the average price of a basket of consumer goods and services, such as transportation, food and medical care. An increase in the CPI swap rate will cause inflation swap payments to be larger, and vice versa.

EV/EBITDA multiples, P/E multiples, EV/Rev multiples, and liquidity discounts
Private equity valuation inputs include EV/EBITDA multiples, P/E multiples and EV/Rev multiples. These are used to calculate either enterprise value or share value of a company based on a multiple of earnings or revenue estimates. Higher multiples equate to higher fair values for all multiple types, and vice versa. A liquidity discount may be applied when few or no transactions exist to support the valuations.

Credit Enhancement
Credit enhancement is an input to the valuation of securitized transaction and is the amount of loan loss protection for a senior tranche. Credit enhancement is expressed as a percentage of the transaction size. An increase in credit enhancement will cause the credit spread to decrease and the tranche fair value to increase, and vice versa.

Interrelationships between unobservable inputs
Unobservable inputs of ARS, including the above discount margin, default rate, prepayment rate, and recovery and loss severity rates, may not be independent of each other. The discount margin of ARS can be affected by a change in default rate, prepayment rate, or recovery and loss severity rates. Discount margins will generally decrease when default rates decline or when recovery rates increase. Prepayments may cause fair value to either increase or decrease.

Changes in fair value measurement for instruments measured on a recurring basis and categorized in Level 3
The following tables present the changes in fair value measurements on a recurring basis for instruments included in Level 3 of the fair value hierarchy.

	For the year ended October 31, 2016								
(Millions of Canadian dollars)	Fair value November 1, 2015	Total realized/ unrealized gains (losses) included in earnings	Total unrealized gains (losses) included in OCI (1)	Purchases of assets/ issuances of liabilities	Sales of assets/ settlements of liabilities and other (2)	Transfers into Level 3	Transfers out of Level 3	Fair value October 31, 2016	Changes in unrealized gains (losses) included in earnings for assets and liabilities for positions still held
Assets									
Securities									
Trading									
Canadian government debt									
Provincial and municipal	$ 5	$ –	$ –	$ –	$ –	$ –	$ (5)	$ –	$ –
U.S. state, municipal and agencies debt	16	(2)	–	21	(34)	–	–	1	–
Other OECD government debt	–	–	–	–	–	–	–	–	–
Mortgage-backed securities	15	(1)	–	8	(22)	–	–	–	–
Asset-backed securities									
CDO	5	–	–	–	(5)	1	(1)	–	–
Non-CDO securities	23	(4)	–	23	(39)	1	–	4	–
Corporate debt and other debt	191	–	5	144	(294)	159	(143)	62	–
Equities	123	(160)	7	492	(89)	10	(7)	376	(163)
	378	(167)	12	688	(483)	171	(156)	443	(163)
Available-for-sale									
U.S. state, municipal and agencies debt	797	(12)	26	93	(157)	–	–	747	n.a.
Other OECD government debt	–	–	–	–	–	–	–	–	n.a.
Asset-backed securities									
CDO	–	–	–	–	–	–	–	–	n.a.
Non-CDO securities	197	(1)	18	26	(23)	–	–	217	n.a.
Corporate debt and other debt	1,757	(5)	17	2,437	(2,825)	21	(446)	956	n.a.
Equities	987	50	(49)	76	(308)	–	–	756	n.a.
	3,738	32	12	2,632	(3,313)	21	(446)	2,676	n.a.
Loans	472	17	(13)	102	(641)	396	(4)	329	–
Other									
Net derivative balances (3)									
Interest rate contracts	(446)	(18)	1	30	(18)	29	(26)	(448)	(17)
Foreign exchange contracts	58	(66)	(6)	(19)	(2)	23	(3)	(15)	(64)
Credit derivatives	(1)	–	–	–	1	–	–	–	(2)
Other contracts	(313)	(121)	(1)	(39)	213	51	88	(122)	55
Valuation adjustments	(47)	–	–	–	23	–	14	(10)	–
Other assets	–	(2)	–	2	–	–	–	–	–
	$ 3,839	$ (325)	$ 5	$ 3,396	$ (4,220)	$ 691	$ (533)	$ 2,853	$ (191)
Liabilities									
Deposits									
Personal	$ (389)	$ (24)	$ 2	$ (207)	$ 82	$ (562)	$ 673	$ (425)	$ (16)
Business and government	(8)	(1)	–	–	9	(2)	–	(2)	(1)
Other									
Obligations related to securities sold short	–	–	–	(1)	–	–	–	(1)	–
Other liabilities	(47)	(22)	(3)	(93)	23	–	54	(88)	(11)
	$ (444)	$ (47)	$ (1)	$ (301)	$ 114	$ (564)	$ 727	$ (516)	$ (28)

(Millions of Canadian dollars)	Fair value November 1, 2014	Total realized/ unrealized gains (losses) included in earnings	Total unrealized gains (losses) included in OCI (1)	Purchases of assets/ issuances of liabilities	Sales of assets/ settlements of liabilities and other (2)	Transfers into Level 3	Transfers out of Level 3	Fair value October 31, 2015	Changes in unrealized gains (losses) included in earnings for assets and liabilities for positions still held
	For the year ended October 31, 2015								
Assets									
Securities									
Trading									
Canadian government debt									
Provincial and municipal	$ –	$ –	$ –	$ –	$ –	$ 5	$ –	$ 5	$ –
U.S. state, municipal and agencies debt	6	(1)	1	40	(30)	–	–	16	–
Other OECD government debt	–	–	–	–	–	20	(20)	–	–
Mortgage-backed securities	4	(4)	–	25	(27)	30	(13)	15	–
Asset-backed securities									
CDO	74	24	(18)	102	(146)	13	(44)	5	–
Non-CDO securities	364	(7)	47	137	(345)	24	(197)	23	(2)
Corporate debt and other debt	149	(1)	5	93	(143)	211	(123)	191	–
Equities	166	(29)	24	16	(75)	45	(24)	123	(28)
	763	(18)	59	413	(766)	348	(421)	378	(30)
Available-for-sale									
U.S. state, municipal and agencies debt	1,389	7	157	136	(846)	–	(46)	797	n.a.
Other OECD government debt	11	–	–	4	(2)	–	(13)	–	n.a.
Asset-backed securities									
CDO	24	–	3	30	–	–	(57)	–	n.a.
Non-CDO securities	182	(1)	40	–	(24)	–	–	197	n.a.
Corporate debt and other debt	1,573	–	246	2,524	(2,586)	37	(37)	1,757	n.a.
Equities	1,028	105	65	52	(225)	17	(55)	987	n.a.
	4,207	111	511	2,746	(3,683)	54	(208)	3,738	n.a.
Loans	461	(8)	47	605	(547)	1	(87)	472	–
Other									
Net derivative balances (3)									
Interest rate contracts	(370)	(89)	(2)	37	(7)	(11)	(4)	(446)	(15)
Foreign exchange contracts	9	46	6	34	(7)	7	(37)	58	36
Credit derivatives	(5)	(15)	(1)	–	19	(1)	2	(1)	(3)
Other contracts	(502)	(113)	(77)	28	216	(98)	233	(313)	124
Valuation adjustments	(85)	(3)	(2)	1	45	(3)	–	(47)	–
Other assets	–	–	–	–	–	–	–	–	–
	$ 4,478	$ (89)	$ 541	$ 3,864	$ (4,730)	$ 297	$ (522)	$ 3,839	$ 112
Liabilities									
Deposits									
Personal	$ (497)	$ 73	$ (41)	$ (545)	$ 88	$ (376)	$ 909	$ (389)	$ 45
Business and government	(70)	(5)	1	(78)	51	–	93	(8)	–
Other									
Obligations related to securities sold short	(4)	–	–	(11)	15	(1)	1	–	–
Other liabilities	(20)	(28)	(5)	–	6	–	–	(47)	(22)
	$ (591)	$ 40	$ (45)	$ (634)	$ 160	$ (377)	$ 1,003	$ (444)	$ 23

(1) These amounts include the foreign currency translation gains or losses arising on consolidation of foreign subsidiaries relating to the Level 3 instruments, where applicable. The unrealized losses on AFS securities recognized in OCI were $27 million for the year ended October 31, 2016 (October 31, 2015 – losses of $5 million), excluding the translation gains or losses arising on consolidation.
(2) Other includes amortization of premiums or discounts recognized in net income.
(3) Net derivatives as at October 31, 2016 included derivative assets of $885 million (October 31, 2015 – $1,143 million) and derivative liabilities of $1,480 million (October 31, 2015 – $1,892 million).
n.a. not applicable

Transfers between fair value hierarchy levels for instruments carried at fair value on a recurring basis

Transfers between Level 1 and Level 2, and transfers into and out of Level 3 are assumed to occur at the end of the period. For an asset or a liability that transfers into Level 3 during the period, the entire change in fair value for the period is excluded from the Total realized/unrealized gains (losses) included in earnings column of the above reconciliation, whereas for transfers out of Level 3 during the period, the entire change in fair value for the period is included in the same column of the above reconciliation.

Transfers between Level 1 and Level 2 are dependent on whether fair value is obtained on the basis of quoted market prices in active markets (Level 1).

During the year ended October 31, 2016, transfers out of Level 1 to Level 2 included $266 million of Trading U.S. state, municipal and agencies debt and $490 million of Obligations related to securities sold short. During the year ended October 31, 2015, transfers out of Level 1 to Level 2 included $284 million of Trading Canadian government debt, $1,988 million of Trading and AFS U.S. state, municipal and agencies debt and $641 million of Obligations related to securities sold short.

During the year ended October 31, 2016, transfers out of Level 2 to Level 1 included $424 million of Trading U.S. state, municipal and agencies debt, $65 million of AFS U.S. state, municipal and agencies debt and $11 million of Obligations related to securities sold short. During the year ended October 31, 2015, transfers out of Level 2 to Level 1 included $128 million of Trading Canadian government debt, $331 million of Trading U.S. state, municipal and agencies debt, $840 million of Trading and AFS Equities, $412 million of AFS Other OECD government debt and $61 million of Obligations related to securities sold short.

Transfers between Level 2 and Level 3 are primarily due to either a change in the market observability for an input, or a change in an unobservable input's significance to a financial instrument's fair value.

For the year ended October 31, 2016, transfers of Trading and AFS Corporate debt and other debt, Other contracts, Trading Non-CDO securities and Loans were due to changes in the market observability of inputs, and transfers relating to Personal deposits were due to changes in the significance of unobservable inputs to their fair value.

During the year ended October 31, 2016, significant transfers out of Level 3 to Level 2 included $143 million of Trading Corporate debt and other debt, $446 million of AFS Corporate debt and other debt and $673 million of Personal deposits. In addition, during the year ended October 31, 2016, significant transfers out of Level 3 to Level 2 included $28 million (net assets) of OTC equity options in Other contracts comprised of $682 million of derivative-related assets and $654 million of derivative related liabilities and $24 million (net assets) of commodity swaps in Other contracts comprised of $126 million of derivative-related assets and $102 million of derivative related liabilities. During the year ended October 31, 2015, significant transfers out of Level 3 to Level 2 included $201 million of net OTC equity options in Other contracts, $197 million of Trading Non-CDO securities, $123 million of Trading Corporate debt and other debt and $909 million of Personal deposits.

During the year ended October 31, 2016, significant transfers out of Level 2 to Level 3 included $159 million of Trading Corporate debt and other debt, $396 million of Loans and $562 million of Personal deposits. In addition, during the year ended October 31, 2016, significant transfers out of Level 2 to Level 3 included $58 million (net assets) of OTC equity options in Other contracts comprised of $407 million of derivative-related assets and $349 million of derivative-related liabilities. During the year ended October 31, 2015, significant transfers out of Level 2 to Level 3 included $211 million of Trading Corporate debt and other debt and $314 million of Personal deposits.

Positive and negative fair value movement of Level 3 financial instruments from using reasonably possible alternative assumptions

A financial instrument is classified as Level 3 in the fair value hierarchy if one or more of its unobservable inputs may significantly affect the measurement of its fair value. In preparing the financial statements, appropriate levels for these unobservable input parameters are chosen so that they are consistent with prevailing market evidence or management judgment. Due to the unobservable nature of the prices or rates, there may be uncertainty about the valuation of these Level 3 financial instruments.

The following table summarizes the impacts to fair values of Level 3 financial instruments using reasonably possible alternative assumptions. This sensitivity disclosure is intended to illustrate the potential impact of the relative uncertainty in the fair value of Level 3 financial instruments. In reporting the sensitivities below, we offset balances in instances where: (i) the move in valuation factor caused an offsetting positive and negative fair value movement, (ii) both offsetting instruments are in Level 3, and (iii) exposures are managed and reported on a net basis. With respect to overall sensitivity, it is unlikely in practice that all reasonably possible alternative assumptions would simultaneously be realized.

	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	**Level 3 fair value**	**Positive fair value movement from using reasonably possible alternatives**	**Negative fair value movement from using reasonably possible alternatives**	Level 3 fair value	Positive fair value movement from using reasonably possible alternatives	Negative fair value movement from using reasonably possible alternatives
Securities						
Trading						
Canadian government debt						
Provincial and municipal	**$ –**	**$ –**	**$ –**	$ 5	$ –	$ –
U.S. state, municipal and agencies debt	**1**	**–**	**–**	16	1	(1)
Mortgage-backed securities	**–**	**–**	**–**	15	1	(1)
Asset-backed securities	**4**	**–**	**–**	28	2	(3)
Corporate debt and other debt	**62**	**1**	**(1)**	191	2	(2)
Equities	**376**	**–**	**–**	123	–	–
Available-for-sale						
U.S. state, municipal and agencies debt	**747**	**14**	**(31)**	797	12	(36)
Asset-backed securities	**217**	**13**	**(19)**	197	11	(16)
Corporate debt and other debt	**956**	**8**	**(8)**	1,757	11	(11)
Equities	**756**	**74**	**(13)**	987	76	(33)
Loans	**329**	**9**	**(10)**	472	8	(23)
Derivatives	**885**	**17**	**(16)**	1,143	16	(10)
	$ 4,333	**$ 136**	**$ (98)**	$ 5,731	$ 140	$ (136)
Deposits	**$ (427)**	**$ 13**	**$ (13)**	$ (397)	$ 13	$ (13)
Derivatives	**(1,480)**	**33**	**(53)**	(1,892)	33	(43)
Other						
Securities sold short, other liabilities	**(89)**	**–**	**–**	(47)	–	–
	$ (1,996)	**$ 46**	**$ (66)**	$ (2,336)	$ 46	$ (56)

Sensitivity results

As at October 31, 2016, the effects of applying other reasonably possible alternative assumptions to the Level 3 asset positions would be an increase of $136 million and a reduction of $98 million in fair value, of which $109 million and $67 million would be recorded in Other components of equity, respectively. The effects of applying these assumptions to the Level 3 liability positions would result in a decrease of $46 million and an increase of $66 million in fair value.

Level 3 valuation inputs and approaches to developing reasonably possible alternative assumptions
The following is a summary of the unobservable inputs used in the valuation of the Level 3 instruments and our approaches to developing reasonably possible alternative assumptions used to determine sensitivity.

Financial assets or liabilities	Sensitivity methodology
Asset-backed securities, corporate debt, government debt and municipal bonds	Sensitivities are determined based on adjusting, plus or minus one standard deviation, the bid-offer spreads or input prices if a sufficient number of prices is received, or using high and low vendor prices as reasonably possible alternative assumptions.
Auction rate securities	Sensitivity of ARS is determined by decreasing the discount margin between 11% and 16% and increasing the discount margin between 22% and 32%, depending on the specific reasonable range of fair value uncertainty for each particular financial instrument's market. Changes to the discount margin reflect historical monthly movements in the student loan asset-backed securities market.
Private equities, hedge fund investments and related equity derivatives	Sensitivity of direct private equity investments is determined by (i) adjusting the discount rate by 2% when the discounted cash flow method is used to determine fair value, (ii) adjusting the price multiples based on the range of multiples of comparable companies when price-based models are used, or (iii) using an alternative valuation approach. Net asset values of the private equity funds, hedge funds and related equity derivatives are provided by the fund managers, and as a result, there are no other reasonably possible alternative assumptions for these investments.
Interest rate derivatives	Sensitivities of interest rate and cross currency swaps are derived using plus or minus one standard deviation of the inputs, and an amount based on model and parameter uncertainty, where applicable.
Equity derivatives	Sensitivity of the Level 3 position is determined by shifting the unobservable model inputs by plus or minus one standard deviation of the pricing service market data including volatility, dividends or correlations, as applicable.
Bank funding and deposits	Sensitivities of deposits are calculated by shifting the funding curve by plus or minus certain basis points.
Structured notes	Sensitivities for interest-rate-linked and equity-linked structured notes are derived by adjusting inputs by plus or minus one standard deviation, and for other deposits, by estimating a reasonable move in the funding curve by plus or minus certain basis points.

Fair value for selected financial instruments that are carried at amortized cost and classified using the fair value hierarchy

(Millions of Canadian dollars)	As at October 31, 2016 Fair value always approximates carrying value (1)	Fair value may not approximate carrying value Fair value measurements using Level 1	Level 2	Level 3	Total	Total fair value
Held-to-maturity securities (2)	$ –	$ 2	$ 15,194	$ 11	$ 15,207	$ 15,207
Assets purchased under reverse repurchase agreements and securities borrowed	41,686	–	22,812	–	22,812	64,498
Loans						
Retail	66,404	–	297,602	5,006	302,608	369,012
Wholesale	6,155	–	137,216	7,349	144,565	150,720
	72,559	–	434,818	12,355	447,173	519,732
Other assets	43,229	–	457	293	750	43,979
	157,474	2	473,281	12,659	485,942	643,416
Deposits						
Personal	175,114	–	59,475	901	60,376	235,490
Business and government	241,950	–	163,782	1,149	164,931	406,881
Bank	12,387	–	5,883	42	5,925	18,312
	429,451	–	229,140	2,092	231,232	660,683
Obligations related to assets sold under repurchase agreements and securities loaned	13,032	–	1,551	–	1,551	14,583
Other liabilities	38,467	–	265	5,106	5,371	43,838
Subordinated debentures	–	–	9,643	57	9,700	9,700
	$ 480,950	$ –	$ 240,599	$ 7,255	$ 247,854	$ 728,804

(Millions of Canadian dollars)	As at October 31, 2015 Fair value always approximates carrying value (1)	Fair value may not approximate carrying value Fair value measurements using Level 1	Level 2	Level 3	Total	Total fair value
Held-to-maturity securities (2)	$ –	$ 2	$ 8,750	$ 7	$ 8,759	$ 8,759
Assets purchased under reverse repurchase agreements and securities borrowed	39,587	–	20,484	–	20,484	60,071
Loans						
Retail	67,330	–	276,661	4,522	281,183	348,513
Wholesale	5,525	–	110,816	4,975	115,791	121,316
	72,855	–	387,477	9,497	396,974	469,829
Other assets	43,889	–	583	380	963	44,852
	156,331	2	417,294	9,884	427,180	583,511
Deposits						
Personal	148,570	–	54,400	1,049	55,449	204,019
Business and government	197,435	–	164,415	1,455	165,870	363,305
Bank	10,538	–	5,107	68	5,175	15,713
	356,543	–	223,922	2,572	226,494	583,037
Obligations related to assets sold under repurchase agreements and securities loaned	9,095	–	833	–	833	9,928
Other liabilities	38,344	–	381	4,471	4,852	43,196
Subordinated debentures	–	–	7,022	56	7,078	7,078
	$ 403,982	$ –	$ 232,158	$ 7,099	$ 239,257	$ 643,239

(1) Certain financial instruments have not been assigned to a level as the carrying amount always approximates their fair values due to the short-term nature (instruments that are receivable or payable on demand, or with original maturity of three months or less) and insignificant credit risk.
(2) Included in Securities – Available-for-sale on the Consolidated Balance Sheets.

Fair values of financial assets and liabilities carried at amortized cost and disclosed in the table above are determined using the following valuation techniques and inputs.

Held-to-maturity securities
Fair values of Canadian Federal and OECD government bonds, and corporate bonds are based on quoted prices. Fair values of certain Non-OECD government bonds are based on vendor prices or the discounted cash flow method with yield curves of other countries' government bonds as inputs.

Assets purchased under reverse repurchase agreements and securities borrowed, and Obligations related to assets sold under repurchase agreements and securities loaned
Valuation methods used for the long-term instruments are described in the Fair value of assets and liabilities measured on a recurring basis and classified using the fair value hierarchy section of this note. The carrying values of short-term instruments generally approximate their fair values.

Loans – Retail
Retail loans include residential mortgages, personal and small business loans and credit cards. For residential mortgages, and personal and small business loans, we segregate the portfolio based on certain attributes such as product type, contractual interest rate, term to maturity and credit scores, if applicable. Fair values of these loans are determined by the discounted cash flow method using applicable inputs such as prevailing interest rates, contractual and posted client rates, client discounts, credit spreads, prepayment rates and loan-to-value ratios. Fair values of credit card receivables are also calculated based on a discounted cash flow method with portfolio yields, charge offs and monthly payment rates as inputs. The carrying values of short-term and variable rate loans generally approximate their fair values.

Loans – Wholesale
Wholesale loans include Business, Bank and Sovereign loans. Where market prices are available, loans are valued based on market prices. Otherwise, fair value is determined by the discounted cash flow method using the following inputs: market interest rates and market based spreads of assets with similar credit ratings and terms to maturity, loss given default, expected default frequency implied from credit default swap prices, if available, and relevant pricing information such as contractual rate, origination and maturity dates, redemption price, coupon payment frequency and date convention.

Deposits
Deposits are comprised of demand, notice, and term deposits which include senior deposit notes we have issued to provide us with long-term funding. Fair values of term deposits are determined by one of several valuation techniques: (i) for term deposits and similar instruments, we segregate the portfolio based on term to maturity. Fair values of these instruments are determined by the discounted cash flow method using inputs such as client rates for new sales of the corresponding terms; and (ii) for senior deposit notes, we use actual traded prices, vendor prices or the discounted cash flow method using a market interest rate curve and our funding spreads as inputs. The carrying values of short-term term deposits, and demand and notice deposits generally approximate their fair values.

Other assets and Other liabilities
Other assets and Other liabilities include receivables and payables relating to certain commodities. Fair values of the commodity receivables and payables are calculated by the discounted cash flow method using applicable inputs such as market interest rates, counterparties' credit spreads, our funding spreads, commodity forward prices and spot prices.

Subordinated debentures
Fair values of Subordinated debentures are based on recent transaction prices.

Note 4 Securities

Carrying value of securities

The following table presents the contractual maturities of the carrying values of financial instruments held at the end of the period:

	As at October 31, 2016						
	Term to maturity (1)						
(Millions of Canadian dollars)	Within 3 months	3 months to 1 year	1 year to 5 years	5 years to 10 years	Over 10 years	With no specific maturity	Total
Trading (2)							
Canadian government debt	$ 6,761	$ 10,350	$ 9,208	$ 2,742	$ 6,153	$ –	$ 35,214
U.S. state, municipal and agencies debt	6,582	6,150	5,912	5,988	15,729	–	40,361
Other OECD government debt	1,639	1,646	2,808	389	438	–	6,920
Mortgage-backed securities	–	34	3	1	1,419	–	1,457
Asset-backed securities (3)	42	80	219	139	81	–	561
Corporate debt and other debt							
Bankers' acceptances	361	–	–	–	–	–	361
Certificates of deposit	155	132	14	2	19	–	322
Other (4)	1,748	4,450	7,473	2,472	3,891	–	20,034
Equities	–	–	–	–	–	46,062	46,062
	17,288	22,842	25,637	11,733	27,730	46,062	151,292
Available-for-sale (2)							
Canadian government debt							
Federal							
Amortized cost	43	1	291	27	56	–	418
Fair value	43	1	293	27	58	–	422
Yield (5)	0.5%	0.3%	1.5%	1.8%	4.2%	–	1.7%
Provincial and municipal							
Amortized cost	–	139	1,863	90	252	–	2,344
Fair value	–	139	1,873	92	260	–	2,364
Yield (5)	–	1.3%	1.9%	4.1%	3.8%	–	2.2%
U.S. state, municipal and agencies debt							
Amortized cost	1,030	895	1,735	1,161	20,668	–	25,489
Fair value	1,029	896	1,734	1,159	20,598	–	25,416
Yield (5)	2.7%	0.9%	1.9%	2.7%	2.4%	–	2.4%
Other OECD government debt							
Amortized cost	3,109	1,396	9,070	293	7	–	13,875
Fair value	3,108	1,398	9,095	292	7	–	13,900
Yield (5)	(0.1%)	1.1%	1.1%	1.0%	3.9%	–	0.8%
Mortgage-backed securities							
Amortized cost	–	16	27	19	330	–	392
Fair value	–	16	27	20	332	–	395
Yield (5)	–	2.2%	2.2%	2.8%	2.3%	–	2.3%
Asset-backed securities							
Amortized cost	671	9	539	834	1,733	–	3,786
Fair value	671	8	540	835	1,679	–	3,733
Yield (5)	–	1.1%	1.1%	2.2%	2.2%	–	1.6%
Corporate debt and other debt							
Amortized cost	1,520	2,933	16,457	553	552	–	22,015
Fair value	1,521	2,934	16,495	558	558	–	22,066
Yield (5)	1.7%	1.8%	1.6%	2.8%	4.7%	–	1.8%
Equities							
Cost	–	–	–	–	–	1,291	1,291
Fair value	–	–	–	–	–	1,552	1,552
Loan substitute securities							
Cost	–	–	–	–	–	70	70
Fair value	–	–	–	–	–	74	74
Yield (5)	–	–	–	–	–	4.5%	4.5%
Amortized cost	6,373	5,389	29,982	2,977	23,598	1,361	69,680
Fair value	6,372	5,392	30,057	2,983	23,492	1,626	69,922
Held-to-maturity (2)							
Amortized cost	130	116	4,521	5,718	4,394	–	14,879
Fair value	130	116	4,583	5,953	4,425	–	15,207
Total carrying value of securities (2)	$ 23,790	$ 28,350	$ 60,215	$ 20,434	$ 55,616	$ 47,688	$ 236,093

(Millions of Canadian dollars)	As at October 31, 2015						
	Term to maturity (1)						
	Within 3 months	3 months to 1 year	1 year to 5 years	5 years to 10 years	Over 10 years	With no specific maturity	Total
Trading (2)							
Canadian government debt	$ 2,310	$ 9,737	$ 9,755	$ 3,618	$ 8,630	$ –	$ 34,050
U.S. state, municipal and agencies debt	1,450	12,867	7,906	3,056	9,176	–	34,455
Other OECD government debt	2,237	4,373	4,402	941	393	–	12,346
Mortgage-backed securities	–	20	42	33	2,827	–	2,922
Asset-backed securities (3)	90	64	263	846	468	–	1,731
Corporate debt and other debt							
Bankers' acceptances	104	1	–	–	–	–	105
Certificates of deposit	59	329	38	12	18	–	456
Other (4)	1,414	2,866	14,318	1,836	3,714	–	24,148
Equities	–	–	–	–	–	48,490	48,490
	7,664	30,257	36,724	10,342	25,226	48,490	158,703
Available-for-sale (2)							
Canadian government debt							
Federal							
Amortized cost	251	572	1,603	68	47	–	2,541
Fair value	251	574	1,605	68	46	–	2,544
Yield (5)	0.4%	0.9%	1.3%	2.9%	4.3%	–	1.2%
Provincial and municipal							
Amortized cost	–	11	1,271	64	253	–	1,599
Fair value	–	11	1,274	64	251	–	1,600
Yield (5)	–	3.3%	1.8%	3.1%	4.2%	–	2.2%
U.S. state, municipal and agencies debt							
Amortized cost	379	2,563	161	304	9,533	–	12,940
Fair value	379	2,563	154	302	9,450	–	12,848
Yield (5)	0.2%	0.6%	5.7%	1.6%	2.3%	–	1.9%
Other OECD government debt							
Amortized cost	3,946	503	7,491	338	–	–	12,278
Fair value	3,947	503	7,501	336	–	–	12,287
Yield (5)	–	1.2%	1.0%	2.2%	–	–	0.7%
Mortgage-backed securities							
Amortized cost	–	–	57	–	258	–	315
Fair value	–	–	57	–	261	–	318
Yield (5)	–	–	1.8%	–	1.9%	–	1.9%
Asset-backed securities							
Amortized cost	–	6	644	702	1,291	–	2,643
Fair value	–	6	650	710	1,222	–	2,588
Yield (5)	–	2.2%	0.6%	0.9%	1.7%	–	1.2%
Corporate debt and other debt							
Amortized cost	1,164	1,603	10,545	369	490	–	14,171
Fair value	1,163	1,601	10,516	369	480	–	14,129
Yield (5)	1.2%	1.9%	1.7%	3.9%	4.4%	–	1.8%
Equities							
Cost	–	–	–	–	–	1,457	1,457
Fair value	–	–	–	–	–	1,756	1,756
Loan substitute securities							
Cost	–	–	–	–	–	95	95
Fair value	–	–	–	–	–	94	94
Yield (5)	–	–	–	–	–	5.1%	5.1%
Amortized cost	5,740	5,258	21,772	1,845	11,872	1,552	48,039
Fair value	5,740	5,258	21,757	1,849	11,710	1,850	48,164
Held-to-maturity (2)							
Amortized cost	889	334	3,175	4,133	110	–	8,641
Fair value	889	334	3,189	4,239	108	–	8,759
Total carrying value of securities (2)	$ 14,293	$ 35,849	$ 61,656	$ 16,324	$ 37,046	$ 50,340	$ 215,508

(1) Actual maturities may differ from contractual maturities shown above since borrowers may have the right to extend or prepay obligations with or without penalties.
(2) Trading securities and AFS securities are recorded at fair value. Held-to-maturity securities are recorded at amortized cost.
(3) Includes CDO which are presented as Asset-backed securities – CDO in the table entitled Fair value of assets and liabilities measured on a recurring basis and classified using the fair value hierarchy in Note 3.
(4) Primarily composed of corporate debt, supra-national debt, and commercial paper.
(5) The weighted average yield is derived using the contractual interest rate and the carrying value at the end of the year for the respective securities.

Unrealized gains and losses on available-for-sale securities (1), (2)

	As at							
	October 31, 2016				October 31, 2015			
(Millions of Canadian dollars)	**Cost/ Amortized cost**	**Gross unrealized gains**	**Gross unrealized losses**	**Fair value**	Cost/ Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Canadian government debt								
Federal	**$ 418**	**$ 4**	**$ –**	**$ 422**	$ 2,541	$ 7	$ (4)	$ 2,544
Provincial and municipal	**2,344**	**22**	**(2)**	**2,364**	1,599	8	(7)	1,600
U.S. state, municipal and agencies debt (3)	**25,489**	**57**	**(130)**	**25,416**	12,940	14	(106)	12,848
Other OECD government debt	**13,875**	**35**	**(10)**	**13,900**	12,278	24	(15)	12,287
Mortgage-backed securities	**392**	**5**	**(2)**	**395**	315	4	(1)	318
Asset-backed securities								
CDO	**1,628**	**2**	**–**	**1,630**	1,506	12	(8)	1,510
Non-CDO securities	**2,158**	**5**	**(60)**	**2,103**	1,137	7	(66)	1,078
Corporate debt and other debt	**22,015**	**89**	**(38)**	**22,066**	14,171	39	(81)	14,129
Equities	**1,291**	**273**	**(12)**	**1,552**	1,457	314	(15)	1,756
Loan substitute securities	**70**	**4**	**–**	**74**	95	–	(1)	94
	$ 69,680	**$ 496**	**$ (254)**	**$ 69,922**	$ 48,039	$ 429	$ (304)	$ 48,164

(1) Excludes $14,879 million of held-to-maturity securities as at October 31, 2016 (October 31, 2015 – $8,641 million) that are carried at amortized cost.
(2) The majority of the MBS are residential. Cost/Amortized cost, gross unrealized gains, gross unrealized losses and fair value related to commercial MBS are $346 million, $1 million, $1 million and $346 million, respectively as at October 31, 2016 (October 31, 2015 – $243 million, $nil, $1 million and $242 million).
(3) Includes securities issued by U.S. non-agencies backed by government insured assets, MBS and asset-backed securities issued by U.S. government agencies.

AFS securities are assessed for objective evidence of impairment at each reporting date and more frequently when conditions warrant. Depending on the nature of the securities under review, we apply specific methodologies to assess whether the cost/amortized cost of the security would be recovered. As at October 31, 2016, our gross unrealized losses on AFS securities were $254 million (October 31, 2015 – $304 million). We believe that there is no objective evidence of impairment on our AFS securities that are in an unrealized loss position as at October 31, 2016.

Net gain and loss on available-for-sale securities (1)

	For the year ended		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014
Realized gains	**$ 179**	$ 218	$ 232
Realized losses	**(17)**	(20)	(15)
Impairment losses	**(86)**	(53)	(25)
	$ 76	$ 145	$ 192

(1) The following related to our insurance operations are excluded from Net gains on AFS securities and included in Insurance premiums, investment and fee income in the Consolidated Statements of Income for the year ended October 31, 2016: Realized gains of $14 million (October 31, 2015 – $22 million; October 31, 2014 – $12 million) and $4 million in impairment losses (October 31, 2015 – $6 million; October 31, 2014 – $nil). There were no realized losses for the year ended October 31, 2016 (October 31, 2015 – $nil; October 31, 2014 – $1 million).

During the year ended October 31, 2016, $76 million of net gains were recognized in Non-interest income as compared to $145 million in the prior year. The current year reflects net realized gains of $162 million mainly comprised of distributions from, and gains on sales of certain Equities and U.S. state, municipal and agencies debt. Also included in the net gains are $86 million of impairment losses primarily on certain Equities, U.S. state, municipal and agencies debt, and Loan substitute securities. This compares to net realized gains for the year ended October 31, 2015 of $198 million which was partially offset by $53 million of impairment losses.

Held-to-maturity securities
Held-to-maturity securities measured at amortized cost are subject to periodic impairment review and are classified as impaired when, in management's opinion, there is no longer reasonable assurance of the timely collection of the full amount of principal and interest. The impairment review of held-to-maturity securities is primarily based on the impairment model for loans. We believe that there is no objective evidence of impairment on our held-to-maturity securities as at October 31, 2016.

Reclassification of financial instruments

During 2016, we reclassified debt securities with carrying amounts of $897 million from AFS to loans and receivables as a result of a change in our intention to hold these securities for the foreseeable future. Upon reclassification, the previous carrying amount of these AFS securities became the new amortized cost under the loans and receivables classification. The net unrealized losses in Other components of equity at the respective reclassification dates will be amortized to Net interest income over the remaining life of the reclassified securities using the effective interest method. This amortization will be offset by the accretion of the fair value discount on these securities.

On their respective reclassification dates, the AFS debt securities reclassified to loans and receivables had a weighted average effective interest rate of 1.31%, with aggregate estimated cash flows expected to be recovered on an undiscounted basis of $925 million. As at October 31, 2016, the fair value and carrying value of the securities reclassified to loans and receivables were $781 million and $782 million, respectively.

During the year ended October 31, 2016, a nominal amount of unrealized gains was recorded in OCI related to changes in the fair value of these debt securities. A nominal amount of unrealized losses would also have been recognized in OCI for the year ended October 31, 2016 had these debt securities not been reclassified. Interest income of $15 million was recognized in net income for the year ended October 31, 2016.

The following table provides information regarding certain securities that we reclassified in prior reporting periods.

Financial instruments reclassified in prior periods

	As at			
	October 31, 2016		October 31, 2015	
(Millions of Canadian dollars)	**Carrying value**	**Fair value**	Carrying value	Fair value
Financial assets – FVTPL reclassified to available-for-sale (1)				
CDO	**$ –**	**$ –**	$ 561	$ 561
Mortgage-backed securities	**–**	**–**	19	19
Financial assets – Available-for-sale reclassified to loans and receivables (2)				
Canadian government debt – Federal	**2,910**	**2,916**	4,083	4,078
Financial assets – Available-for-sale reclassified to held-to-maturity (3)				
Canadian government debt – Federal	**3,923**	**3,970**	5,231	5,231
	$ 6,833	**$ 6,886**	$ 9,894	$ 9,889

(1) On October 1, 2011 and November 1, 2011, we reclassified $1,872 million and $255 million, respectively, of certain CDO and U.S. non-agency MBS from classified as at FVTPL to AFS.
(2) On October 1, 2015, we reclassified $4,132 million of certain debt securities from classified as AFS to loans and receivables.
(3) On October 1, 2015, we reclassified $5,240 million of certain debt securities from classified as AFS to held-to-maturity.

The following table provides the amounts recorded in net income and OCI from the debt securities after the reclassification.

	For the year ended					
	October 31, 2016		October 31, 2015		October 31, 2014	
(Millions of Canadian dollars)	Unrealized gains (losses) during the period (1)	Interest income/ gains (losses) recognized in net income during the period	Unrealized gains (losses) during the period (1)	Interest income/ gains (losses) recognized in net income during the period	Unrealized gains (losses) during the period (1)	Interest income/ gains (losses) recognized in net income during the period
FVTPL reclassified to available-for-sale						
CDO	$ (4)	$ 11	$ (17)	$ 28	$ (29)	$ 58
Mortgage-backed securities	–	–	–	2	(2)	4
Available-for-sale reclassified to loans and receivables (2)						
Canadian government debt – Federal	(7)	76	(8)	7	n.a.	n.a.
Available-for-sale reclassified to held-to-maturity (2)						
Canadian government debt – Federal	(38)	135	(9)	14	n.a.	n.a.
	$ (49)	$ 222	$ (34)	$ 51	$ (31)	$ 62

(1) This represents the unrealized gains or losses that would have been recognized in profit or loss (for reclassifications from FVTPL) or OCI (for reclassifications from AFS) had the assets not been reclassified.
(2) Interest income/gains (losses) recognized in net income during the period includes amortization of net unrealized gains associated with reclassified assets that were included in Other components of equity on the date of reclassification.
n.a. not applicable

Note 5 Loans

(Millions of Canadian dollars)	As at October 31, 2016 Canada	United States	Other International	Total	As at October 31, 2015 Canada	United States	Other International	Total
Retail (1)								
Residential mortgages	**$ 241,800**	**$ 10,014**	**$ 3,184**	**$ 254,998**	$ 229,987	$ 772	$ 3,216	$ 233,975
Personal	**82,205**	**6,853**	**4,408**	**93,466**	84,637	4,623	5,086	94,346
Credit cards	**16,601**	**267**	**260**	**17,128**	15,516	89	254	15,859
Small business (2)	**3,878**	**–**	**–**	**3,878**	4,003	–	–	4,003
	344,484	**17,134**	**7,852**	**369,470**	334,143	5,484	8,556	348,183
Wholesale (1)								
Business (3)	**65,756**	**58,010**	**20,304**	**144,070**	60,221	34,385	21,952	116,558
Bank (4)	**1,027**	**445**	**207**	**1,679**	530	115	1,155	1,800
Sovereign (5)	**6,625**	**827**	**1,168**	**8,620**	6,332	–	1,379	7,711
	73,408	**59,282**	**21,679**	**154,369**	67,083	34,500	24,486	126,069
Total loans	**417,892**	**76,416**	**29,531**	**523,839**	401,226	39,984	33,042	474,252
Allowance for loan losses	**(1,491)**	**(262)**	**(482)**	**(2,235)**	(1,416)	(131)	(482)	(2,029)
Total loans net of allowance for loan losses	**$ 416,401**	**$ 76,154**	**$ 29,049**	**$ 521,604**	$ 399,810	$ 39,853	$ 32,560	$ 472,223

(1) Geographic information is based on residence of borrower.
(2) Includes small business exposure managed on a pooled basis.
(3) Includes small business exposure managed on an individual client basis.
(4) Bank refers primarily to regulated deposit-taking institutions and securities firms.
(5) Sovereign refers to all central governments and agencies, central banks, as well as other qualifying public sector entities and multilateral development banks.

Loans maturity and rate sensitivity

(Millions of Canadian dollars)	As at October 31, 2016 Maturity term (1) Under 1 year (2)	1 to 5 years	Over 5 years	Total	Rate sensitivity Floating	Fixed Rate	Non-rate-sensitive	Total
Retail	**$ 190,834**	**$ 161,953**	**$ 16,683**	**$ 369,470**	**$ 116,355**	**$ 247,021**	**$ 6,094**	**$ 369,470**
Wholesale	**121,625**	**23,721**	**9,023**	**154,369**	**55,639**	**95,133**	**3,597**	**154,369**
Total loans	**$ 312,459**	**$ 185,674**	**$ 25,706**	**$ 523,839**	**$ 171,994**	**$ 342,154**	**$ 9,691**	**$ 523,839**
Allowance for loan losses				**(2,235)**				**(2,235)**
Total loans net of allowance for loan losses				**$ 521,604**				**$ 521,604**

(Millions of Canadian dollars)	As at October 31, 2015 Maturity term (1) Under 1 year (2)	1 to 5 years	Over 5 years	Total	Rate sensitivity Floating	Fixed Rate	Non-rate-sensitive	Total
Retail	$ 194,596	$ 143,352	$ 10,235	$ 348,183	$ 126,141	216,841	5,201	$ 348,183
Wholesale	101,922	19,505	4,642	126,069	53,799	70,827	1,443	126,069
Total loans	$ 296,518	$ 162,857	$ 14,877	$ 474,252	$ 179,940	$ 287,668	$ 6,644	$ 474,252
Allowance for loan losses				(2,029)				(2,029)
Total loans net of allowance for loan losses				$ 472,223				$ 472,223

(1) Generally, based on the earlier of contractual repricing or maturity date.
(2) Includes variable rate loans that can be repriced at the clients' discretion without penalty.

Allowance for credit losses

(Millions of Canadian dollars)	Balance at beginning of period	Provision for credit losses	Write-offs	Recoveries	Unwind of discount	Exchange rate changes/ other	Balance at end of period
	For the year ended October 31, 2016						
Retail							
Residential mortgages	**$ 242**	**$ 77**	**$ (42)**	**$ 5**	**$ (24)**	**$ 15**	**$ 273**
Personal	**530**	**458**	**(556)**	**111**	**(14)**	**–**	**529**
Credit cards	**386**	**442**	**(564)**	**122**	**–**	**–**	**386**
Small business	**64**	**34**	**(40)**	**10**	**(3)**	**–**	**65**
	1,222	**1,011**	**(1,202)**	**248**	**(41)**	**15**	**1,253**
Wholesale							
Business	**805**	**528**	**(321)**	**38**	**(59)**	**(12)**	**979**
Bank	**2**	**(3)**	**–**	**–**	**–**	**1**	**–**
	807	**525**	**(321)**	**38**	**(59)**	**(11)**	**979**
Acquired credit-impaired loans	**–**	**10**	**–**	**–**	**–**	**(7)**	**3**
Total allowance for loan losses	**2,029**	**1,546**	**(1,523)**	**286**	**(100)**	**(3)**	**2,235**
Allowance for off-balance sheet and other items (1)	**91**	**–**	**–**	**–**	**–**	**–**	**91**
Total allowance for credit losses	**$ 2,120**	**$ 1,546**	**$ (1,523)**	**$ 286**	**$ (100)**	**$ (3)**	**$ 2,326**
Individually assessed	**$ 252**	**$ 351**	**$ (224)**	**$ 25**	**$ (50)**	**$ 11**	**$ 365**
Collectively assessed	**1,868**	**1,195**	**(1,299)**	**261**	**(50)**	**(14)**	**1,961**
Total allowance for credit losses	**$ 2,120**	**$ 1,546**	**$ (1,523)**	**$ 286**	**$ (100)**	**$ (3)**	**$ 2,326**

(Millions of Canadian dollars)	Balance at beginning of period	Provision for credit losses	Write-offs	Recoveries	Unwind of discount	Exchange rate changes/ other	Balance at end of period
	For the year ended October 31, 2015						
Retail							
Residential mortgages	$ 240	$ 46	$ (64)	$ 7	$ (23)	$ 36	$ 242
Personal	535	384	(494)	105	(16)	16	530
Credit cards	385	378	(497)	119	–	1	386
Small business	64	32	(40)	10	(2)	–	64
	1,224	840	(1,095)	241	(41)	53	1,222
Wholesale							
Business	768	258	(243)	33	(39)	28	805
Bank	2	(1)	–	1	–	–	2
	770	257	(243)	34	(39)	28	807
Total allowance for loan losses	1,994	1,097	(1,338)	275	(80)	81	2,029
Allowance for off-balance sheet and other items (1)	91	–	–	–	–	–	91
Total allowance for credit losses	$ 2,085	$ 1,097	$ (1,338)	$ 275	$ (80)	$ 81	$ 2,120
Individually assessed	$ 214	$ 149	$ (132)	$ 18	$ (26)	$ 29	$ 252
Collectively assessed	1,871	948	(1,206)	257	(54)	52	1,868
Total allowance for credit losses	$ 2,085	$ 1,097	$ (1,338)	$ 275	$ (80)	$ 81	$ 2,120

(Millions of Canadian dollars)	Balance at beginning of period	Provision for credit losses	Write-offs	Recoveries	Unwind of discount	Exchange rate changes/ other	Balance at end of period
	For the year ended October 31, 2014						
Retail							
Residential mortgages	$ 151	$ 95	$ (30)	$ 2	$ (26)	$ 48	$ 240
Personal	583	444	(565)	106	(23)	(10)	535
Credit cards	385	353	(466)	114	–	(1)	385
Small business	61	44	(47)	9	(2)	(1)	64
	1,180	936	(1,108)	231	(51)	36	1,224
Wholesale							
Business	777	228	(221)	32	(36)	(12)	768
Bank	2	–	–	–	–	–	2
	779	228	(221)	32	(36)	(12)	770
Total allowance for loan losses	1,959	1,164	(1,329)	263	(87)	24	1,994
Allowance for off-balance sheet and other items (1)	91	–	–	–	–	–	91
Total allowance for credit losses	$ 2,050	$ 1,164	$ (1,329)	$ 263	$ (87)	$ 24	$ 2,085
Individually assessed	$ 240	$ 160	$ (188)	$ 16	$ (24)	$ 10	$ 214
Collectively assessed	1,810	1,004	(1,141)	247	(63)	14	1,871
Total allowance for credit losses	$ 2,050	$ 1,164	$ (1,329)	$ 263	$ (87)	$ 24	$ 2,085

(1) The allowance for off-balance sheet and other items is reported separately in Other liabilities – Provisions.

Net interest income after provision for credit losses

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Net interest income	**$ 16,531**	$ 14,771	$ 14,116
Provision for credit losses	**1,546**	1,097	1,164
Net interest income after provision for credit losses	**$ 14,985**	$ 13,674	$ 12,952

Loans past due but not impaired

	As at							
	October 31, 2016				October 31, 2015			
(Millions of Canadian dollars)	**1 to 29 days**	**30 to 89 days**	**90 days and greater**	**Total**	1 to 29 days	30 to 89 days	90 days and greater	Total
Retail	**$ 3,450**	**$ 1,296**	**$ 337**	**$5,083**	$ 3,054	$ 1,298	$ 314	$4,666
Wholesale	**848**	**372**	**–**	**1,220**	417	184	–	601
	$ 4,298	**$ 1,668**	**$ 337**	**$6,303**	$ 3,471	$ 1,482	$ 314	$5,267

Gross carrying value of loans individually determined to be impaired (1)

(Millions of Canadian dollars)	As at October 31 2016	October 31 2015
Retail (2)	**$ 16**	$ –
Wholesale (2)		
Business	**2,130**	991
Bank	**2**	2
Acquired credit-impaired loans	**418**	–
	$ 2,566	$ 993

(1) Average balance of gross individually assessed impaired loans for the year ended October 31, 2016 was $2,037 million (October 31, 2015 – $830 million).
(2) Excludes ACI loans.

Acquired Credit-Impaired Loans
ACI loans resulting from the acquisition of City National include Retail, Wholesale and FDIC covered loans with outstanding unpaid principal balances of $27 million, $73 million and $642 million and fair values of $22 million, $62 million and $596 million, respectively, as at November 2, 2015 (the acquisition date).

The following table provides further details of our ACI loans.

(Millions of Canadian dollars)	As at October 31 2016
City National	
Unpaid principal balance (1)	**$ 409**
Credit related fair value adjustments	**(12)**
Interest rate and other related premium/(discount)	**21**
Carrying value	**418**
Individually assessed allowance	**(3)**
Carrying value net of related allowance (2)	**$ 415**

(1) Represents contractual amount owed net of write-offs since the acquisition of the loan.
(2) Carrying value does not include the effect of FDIC loss-share agreements.

FDIC Covered Loans
As at October 31, 2016, the balance of FDIC covered loans was $374 million and was recorded in Loans on the Consolidated Balance Sheet. As at October 31, 2016, the balances for indemnification assets and clawback liabilities were $2 million and $26 million, respectively.

Note 6 Derecognition of financial assets

We enter into transactions in which we transfer financial assets such as loans or securities to structured entities or other third parties. 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 we continue to be exposed to substantially all of the risks and rewards of the transferred assets, such as prepayment, credit, price, interest rate and foreign exchange risks.

Note 6 Derecognition of financial assets (continued)

Transferred financial assets not derecognized

Securitization of Canadian residential mortgage loans

We securitize insured Canadian residential mortgage loans through the creation of MBS pools under the National Housing Act MBS (NHA MBS) program. All loans securitized under the NHA MBS program are required to be insured by the Canadian Mortgage Housing Corporation or a third-party insurer. We require the borrower to pay the insurance for mortgages in which the loan amount is greater than 80% of the original appraised value of the property (loan-to-value (LTV) ratio). For residential mortgage loans securitized under this program with an LTV ratio less than 80%, we are required to insure the mortgages at our own expense. Under the NHA MBS program, we are responsible for making all payments due on our issued MBS, regardless of whether we collect the necessary funds from the mortgagor or the insurer. When a borrower defaults on a mortgage payment, we submit a claim to the insurer if the amount recovered from the collection or foreclosure process is lower than the sum of the principal balance, accrued interest and collection costs on the outstanding loan. The insurance claim process is managed by the insurance provider in accordance with the insurer's policies and covers the entire unpaid loan balance plus generally up to 12 months of interest, selling costs and other eligible expenses. If an insurance claim is denied, a loss is recognized in Provision for credit losses in our Consolidated Statements of Income. The amount recorded as a loss is not significant to our Consolidated Financial Statements and no significant losses were incurred due to legal action arising from a mortgage default during 2016 and 2015.

We sell the NHA MBS pools primarily to a government-sponsored structured entity under the Canada Mortgage Bond (CMB) program. The entity periodically issues CMBs, which are guaranteed by the government, and sells them to third-party investors. Proceeds of the CMB issuances are used by the entity to purchase the NHA MBS pools from eligible NHA MBS issuers who participate in the issuance of a particular CMB series. Our continuing involvement includes servicing the underlying residential mortgage loans we have securitized, either ourselves or through a third-party servicer. We also act as counterparty in interest rate swap agreements where we pay the entity the interest due to CMB investors and receive the interest on the underlying MBS and reinvested assets. As part of the swaps, we are also required to maintain a principal reinvestment account for principal payments received on the underlying mortgage loans to meet the repayment obligation upon maturity of the CMB. We reinvest the collected principal payments in permitted investments as outlined in the swap agreements.

We have determined that certain of the NHA MBS program loans transferred to the entity do not qualify for derecognition as we have not transferred substantially all of the risks and rewards of ownership. As a result, these transferred MBS continue to be classified as residential mortgage loans and recognized on our Consolidated Balance Sheets. The cash received for these transferred MBS is treated as a secured borrowing and a corresponding liability recorded in Deposits – Business and government on our Consolidated Balance Sheets.

Securities sold under repurchase agreements and securities loaned

We also enter into transactions such as repurchase agreements and securities lending agreements where we transfer assets under agreements to repurchase them on a future day and retain substantially all of the risks and rewards associated with the assets. These transferred assets remain on our Consolidated Balance Sheets and are accounted for as collateralized borrowing transactions.

The following table provides information on the carrying amount and fair value of the transferred assets that did not qualify for derecognition, and their associated liabilities.

	As at							
	October 31, 2016				October 31, 2015			
(Millions of Canadian dollars)	**Canadian residential mortgage loans** (1) (2)	**Securities sold under repurchase agreements** (3)	**Securities loaned** (3)	**Total**	Canadian residential mortgage loans (1) (2)	Securities sold under repurchase agreements (3)	Securities loaned (3)	Total
Carrying amount of transferred assets that do not qualify for derecognition	**$ 33,648**	**$ 100,556**	**$ 2,885**	**$ 137,089**	$ 35,707	$ 78,327	$ 4,961	$ 118,995
Carrying amount of associated liabilities	**33,670**	**100,556**	**2,885**	**137,111**	36,130	78,327	4,961	119,418
Fair value of transferred assets	**$ 33,574**	**$ 100,556**	**$ 2,885**	**$ 137,015**	$ 35,770	$ 78,327	$ 4,961	$ 119,058
Fair value of associated liabilities	**34,730**	**100,556**	**2,885**	**138,171**	37,150	78,327	4,961	120,438
Fair value of net position	**$ (1,156)**	**$ –**	**$ –**	**$ (1,156)**	$ (1,380)	$ –	$ –	$ (1,380)

(1) Includes Canadian residential mortgage loans transferred primarily to Canada Housing Trust at the initial securitization and other permitted investments used for funding requirements after the initial securitization.
(2) CMB investors have legal recourse only to the transferred assets, and do not have recourse to our general assets.
(3) Does not include over-collateralization of assets pledged.

Note 7 Structured entities

In the normal course of business, we engage in a variety of financial transactions with structured entities to support our financing and investing needs as well as those of our customers. A structured entity is an entity in which voting or similar rights are not the dominant factor in deciding control. Structured entities are generally created to achieve a narrow and well defined objective with restrictions around their ongoing activities. We consolidate a structured entity when we control the entity in accordance with our accounting policy as described in Note 2. In other cases, we may sponsor or have an interest in such an entity but not consolidate it.

Consolidated structured entities

We consolidate the following structured entities, whose assets and liabilities are recorded on our Consolidated Balance Sheets. Third-party investors in these structured entities generally have recourse only to the assets of the related entity and do not have recourse to our general assets unless we breach our contractual obligations to those entities. In the ordinary course of business, the assets of each consolidated structured entity can generally only be used to settle the obligations of that entity.

Credit card securitization vehicle
We securitize a portion of our credit card receivables through a structured entity on a revolving basis. The entity purchases co-ownership interests in a pool of credit card receivables and issues senior and subordinated term notes collateralized by the underlying pool of credit card receivables. Investors who purchase the term notes have recourse only to the underlying pool of credit card receivables.

We continue to service the credit card receivables sold and perform an administrative role for the entity. We also provide first-loss protection through our retained interest in the transferred assets, the cash reserve balance we fund from time to time, and also through certain subordinated notes which we retain. Additionally, we may own some senior notes as investments or for market-making activities; we provide subordinated loans to the entity to pay upfront expenses; and we act as counterparty to interest rate and cross currency swap agreements which hedge the entity's interest rate and currency risk exposure.

We consolidate the structured entity because we have decision making power over the timing and size of future issuances and other relevant activities which were predetermined by us at inception. We also obtain significant funding benefits and are exposed to the majority of the residual ownership risks through the credit support provided. As at October 31, 2016, $9.8 billion of notes issued by our credit card securitization vehicle were included in Deposits on our Consolidated Balance Sheets (October 31, 2015 – $9.1 billion).

Collateralized commercial paper vehicle
We established a funding vehicle that provides loans to us and finances those loans by issuing commercial paper to third-party investors. The structured entity's commercial paper carries an equivalent credit rating to RBC because we are obligated to advance funds to the entity in the event there are insufficient funds from other sources to settle maturing commercial paper. We pledge collateral to secure the loans and are exposed to the market and credits risks of the pledged securities. We administer the entity and earn an administration fee for providing these services.

We consolidate the structured entity because we have decision making power over the relevant activities, are the sole borrower from the structure, and are exposed to a majority of the residual ownership risks through the credit support provided. As at October 31, 2016, $9.6 billion of commercial paper issued by the vehicle was included in Deposits on our Consolidated Balance Sheets (October 31, 2015 – $11.8 billion).

Innovative capital vehicles
RBC Capital Trust was created to issue innovative capital instruments, the proceeds from which were used to purchase mortgages from RBC. We consolidate the trust as, through our roles as trustee, administrative agent and equity investor, we have the decision making power over the relevant activities of the trust and are exposed to variability from the performance of the underlying mortgages. Refer to Note 20 for further details on our innovative capital instruments.

Covered bonds
RBC Covered Bond Guarantor Limited Partnership (Guarantor LP) was created to issue guarantees of covered bonds that we issue. We periodically transfer mortgages to Guarantor LP to support funding activities and asset coverage requirements under our covered bond program. The covered bonds guaranteed by Guarantor LP are direct, unsecured and unconditional obligations of RBC; therefore, investors have a claim against the Bank which will continue if the covered bonds are not paid by the Bank and the mortgage assets in Guarantor LP are insufficient to satisfy the obligations owing on the covered bonds. We act as general partner, limited partner, swap counterparty, lender and liquidity provider to Guarantor LP and registered issuer of the covered bonds.

We consolidate Guarantor LP as we have the decision making power over the relevant activities through our role as general partner and are exposed to variability from the performance of the underlying mortgages. As at October 31, 2016, the total amount of mortgages transferred and outstanding was $53.8 billion (October 31, 2015 – $54.5 billion) and $40.5 billion of covered bonds were recorded as Deposits on our Consolidated Balance Sheets (October 31, 2015 – $37.2 billion).

Municipal bond TOB structures
We sell taxable and tax-exempt municipal bonds into Tender Option Bond (TOB) structures, which consist of a credit enhancement (CE) trust and a TOB trust. The CE trust purchases a bond from us, financed with a trust certificate issued to the TOB trust. The TOB trust then issues floating-rate certificates to short-term investors and a residual certificate that is held by us. We are the remarketing agent for the floating-rate certificates and provide a liquidity facility to the TOB trust which requires us to purchase any certificates tendered but not successfully remarketed. We also provide a letter of credit to the CE trust under which we are required to extend funding if there are any losses on the underlying bonds. We earn interest on the residual certificate and receive market-based fees for acting as remarketing agent and providing the liquidity facility and letter of credit.

We consolidate both the CE trust and TOB trust when we are the holder of the residual certificate as we have decision making power over the relevant activities, including the selection of the underlying municipal bonds and the ability to terminate the structure, and are exposed to variability from the performance of the underlying municipal bonds. As at October 31, 2016, $2.5 billion of municipal bonds were included in AFS securities related to consolidated TOB structures (October 31, 2015 – $6.0 billion) and a corresponding $2.5 billion of floating-rate certificates were included in Deposits on our Consolidated Balance Sheets (October 31, 2015 – $6.1 billion).

Non-RBC managed investment funds
We enter into certain fee-based equity derivative transactions where our investments in the reference funds are held by an intermediate limited partnership entity (intermediate entity) in which we hold a substantial majority of the equity interests. We consolidate the intermediate entity because we have decision making power to direct all the activities of the entity and are exposed to a majority of the risks and rewards through our equity investments. As at October 31, 2016, $179 million of Trading securities representing our investments in the reference funds were recorded on our Consolidated Balance Sheets (October 31, 2015 – $227 million).

RBC managed investment funds
We are sponsors and investment managers of mutual and pooled funds, which give us the ability to direct the investment decisions of the funds. We consolidate those mutual and pooled funds in which our interests, which include direct investment in seed capital plus management or performance fees, indicate that we are acting as a principal. As at October 31, 2016, $498 million of Trading securities held in the consolidated funds (October 31, 2015 – $586 million) and $126 million of Other liabilities representing the fund units held by third parties (October 31, 2015 – $190 million) were recorded on our Consolidated Balance Sheets.

Unconsolidated structured entities

We have interests in certain structured entities that we do not consolidate but have recorded assets and liabilities on our Consolidated Balance Sheets related to our transactions and involvement with these entities.

The following table presents the assets and liabilities recorded on our Consolidated Balance Sheets and our maximum exposure to loss related to our interests in unconsolidated structured entities. It also presents the size of each class of unconsolidated structured entity, as measured by the total assets of the entities in which we have an interest.

	As at October 31, 2016						
(Millions of Canadian dollars)	**Multi-seller conduits** (1) (2)	**Structured finance**	**Non-RBC managed investment funds**	**RBC managed investment funds**	**Third-party securitization vehicles**	**Other**	**Total**
On-balance sheet assets							
Securities	**$ 675**	**$ –**	**$ 2,543**	**$ 213**	**$ –**	**$ 777**	**$ 4,208**
Loans	**733**	**1,179**	**–**	**–**	**4,359**	**–**	**6,271**
Derivatives	**11**	**–**	**–**	**–**	**3**	**21**	**35**
Other assets	**–**	**549**	**3**	**156**	**–**	**75**	**783**
	$ 1,419	**$ 1,728**	**$ 2,546**	**$ 369**	**$ 4,362**	**$ 873**	**$ 11,297**
On-balance sheet liabilities							
Derivatives	**$ 68**	**$ –**	**$ –**	**$ –**	**$ –**	**$ 3**	**$ 71**
Other liabilities	**–**	**–**	**27**	**–**	**–**	**1**	**28**
	$ 68	**$ –**	**$ 27**	**$ –**	**$ –**	**$ 4**	**$ 99**
Maximum exposure to loss (3)	**$ 39,475**	**$ 4,725**	**$ 3,378**	**$ 370**	**$ 8,998**	**$ 1,301**	**$ 58,247**
Total assets of unconsolidated structured entities	**$ 38,703**	**$ 20,650**	**$ 587,125**	**$ 308,683**	**$ 113,627**	**$ 63,792**	**$ 1,132,580**

	As at October 31, 2015						
(Millions of Canadian dollars)	Multi-seller conduits (1) (2)	Structured finance	Non-RBC managed investment funds	RBC managed investment funds	Third-party securitization vehicles	Other	Total
On-balance sheet assets							
Securities	$ 17	$ –	$ 2,661	$ 275	$ –	$ 697	$ 3,650
Loans	764	1,323	–	–	5,447	–	7,534
Derivatives	19	2	–	–	3	54	78
Other assets	–	547	1	225	–	57	830
	$ 800	$ 1,872	$ 2,662	$ 500	$ 5,450	$ 808	$ 12,092
On-balance sheet liabilities							
Derivatives	$ 24	$ –	$ –	$ –	$ –	$ 11	$ 35
Other liabilities	–	–	33	–	–	2	35
	$ 24	$ –	$ 33	$ –	$ –	$ 13	$ 70
Maximum exposure to loss (3)	$ 37,789	$ 3,681	$ 3,440	$ 490	$ 9,694	$ 927	$ 56,021
Total assets of unconsolidated structured entities	$ 37,044	$ 21,621	$ 658,236	$ 278,474	$ 125,294	$ 67,658	$ 1,188,327

(1) Total assets of unconsolidated structured entities represent the maximum assets that may have to be purchased by the conduits under purchase commitments outstanding. Of the purchase commitments outstanding, the conduits have purchased financial assets totalling $24.6 billion as at October 31, 2016 (October 31, 2015 – $25.2 billion).

(2) Securities include $670 million of asset-backed commercial paper (ABCP) purchased pursuant to the Risk Retention Rules (October 31, 2015 – $nil).

(3) The maximum exposure to loss resulting from our interests in these entities consists mostly of investments, loans, fair value of derivatives, liquidity and credit enhancement facilities. The maximum exposure to loss of the multi-seller conduits is higher than the on-balance sheet assets primarily by the notional amounts of the backstop liquidity and credit enhancement facilities. Refer to Note 26.

Below is a description of our involvement with each significant class of unconsolidated structured entity.

Multi-seller conduits

We administer five multi-seller ABCP conduit programs (multi-seller conduits) – two in Canada and three in the U.S. These conduits primarily purchase financial assets from clients and finance those purchases by issuing ABCP.

We do not maintain any ownership in the multi-seller conduits that we administer and have no rights to, or control of, their assets. As the administrative agent, we earn a residual fee for providing services such as coordinating funding activities, transaction structuring, documentation, execution and monitoring of transactions. The ABCP issued by each multi-seller conduit is in the conduit's own name with recourse to the financial assets owned by each multi-seller conduit, and is non-recourse to us except through our participation in liquidity and/or credit enhancement facilities.

In October 2014, the U.S. federal regulators adopted regulations related to the credit risk retention requirements for asset-backed securities (Risk Retention Rules) of the Dodd-Frank Act. We have begun purchasing ABCP from the U.S. multi-seller conduits as part of our implementation plan to comply with the Risk Retention Rules by December 24, 2016. We continue to serve as placement agent for the multi-seller conduits and may purchase ABCP issued by these conduits from time to time in order to facilitate the overall program liquidity.

We provide transaction-specific and program-wide liquidity facilities to the multi-seller conduits. In addition, we provide program-wide credit enhancement to the multi-seller conduits which obligate us to purchase assets or advance funds in the event the multi-seller conduit does not otherwise have funds from other sources, such as from the liquidity facilities, to settle maturing ABCP. In some cases, we or another third party may provide transaction-specific credit enhancement which can take various forms. We receive market-based fees for providing these liquidity and credit facilities.

For certain transactions, we act as counterparty to foreign exchange forward contracts and interest rate swaps to facilitate our clients' securitization of fixed rate and/or foreign currency denominated assets through the conduits. These derivatives expose us to foreign exchange and interest rate risks that are centrally managed by our foreign exchange trading and swap desks, respectively, and credit risk on the underlying assets that is mitigated by the credit enhancement described below.

Each transaction is structured with transaction-specific first loss protection provided by the third-party seller. This enhancement can take various forms, including but not limited to overcollateralization, excess spread, subordinated classes of financial assets, guarantees or letters of credit. The amount of this enhancement varies but is generally sized to cover a multiple of loss experience.

An unrelated third party (expected loss investor) absorbs losses, up to a maximum contractual amount, that may occur in the future on the assets in the multi-seller conduits before the multi-seller conduits' debt holders and us. In return for assuming this multi-seller conduit first-loss position, each multi-seller conduit pays the expected loss investor a return commensurate with its risk position. The expected loss investor has substantive power to direct the majority of the activities which significantly impact the conduit's economic performance, including initial selection and approval of the asset purchase commitments and liquidity facilities, approval of renewal and amendment of these transactions and facilities, sale or transfer of assets, ongoing monitoring of asset performance, mitigation of losses, and management of the ABCP liabilities.

We do not consolidate these multi-seller conduits as we do not have decision making power to direct the relevant activities noted above.

Structured finance

We purchased U.S. ARS from certain trusts (U.S. ARS Trusts) which fund their long-term investments in student loans by issuing short-term senior and subordinated notes. We are subject to losses on these U.S. ARS Trusts if defaults are experienced on the underlying student loans; however, in the majority of these structures, the principal and accrued interest on the student loans are guaranteed by U.S. government agencies. We act as auction agent for some of these entities but have no legal obligation to purchase the notes issued by these entities in the auction process. We do not consolidate these U.S. ARS Trusts as we do not have decision making power over the investing and financing activities of the Trusts, which are the activities that most significantly affect the performance of the Trusts.

Additionally, we invest in certain municipal bond TOB structures that we do not consolidate. These structures are similar to those consolidated municipal bond TOB structures described above; however, the residual certificates are held by third-parties and we do not provide credit enhancement of the underlying assets. We provide liquidity facilities on the floating-rate certificates which may be drawn if certificates are tendered but not able to be remarketed. We do not have decision making power over the relevant activities of the structures; therefore, we do not consolidate these structures. The assets transferred into these programs are derecognized from our Consolidated Balance Sheets.

We provide senior warehouse financing to structured entities that are established by third parties to acquire loans for the purposes of issuing a term collateralized loan obligation (CLO) transaction. Subordinated financing is provided during the warehouse phase by one or more third-party equity investors. We act as the arranger and placement agent for the term CLO transaction. Proceeds from the sale of the term CLO are used to repay our senior warehouse financing, at which point we have no further involvement with the transaction. We do not consolidate these CLO structures as we do not have decision making power over the relevant activities of the entity, which include the initial selection and subsequent management of the underlying debt portfolio.

Non-RBC managed investment funds

We enter into fee-based equity derivative transactions with third parties including mutual funds, unit investment trusts and other investment funds. These transactions provide their investors with the desired exposure to a reference fund, and we economically hedge our exposure to these derivatives by investing in those reference funds. We also act as custodian or administrator for several funds. We do not consolidate those reference funds that are managed by third parties as we do not have power to direct their investing activities.

We provide liquidity facilities to certain third-party investment funds. The funds issued unsecured variable-rate preferred shares and invest in portfolios of tax-exempt municipal bonds. Undrawn liquidity commitments expose us to liquidity risk of the preferred shares and drawn commitments expose us to the credit risk of the underlying municipal bonds. We do not consolidate these third-party managed funds as we do not have power to direct their investing activities.

RBC managed investment funds

We are sponsors and investment managers of mutual and pooled funds, which gives us the ability to direct the investment decisions of the funds. We do not consolidate those mutual and pooled funds in which our interests indicate that we are exercising our decision making power as an agent of the other unit holders.

Third-party securitization vehicles

We hold interests in securitization vehicles that provide funding to certain third parties on whose behalf the entities were created. The activities of these entities are limited to the purchase and sale of specified assets from the sponsor and the issuance of asset-backed notes collateralized by those assets. The underlying assets are typically receivables, including auto loans and leases. We, as well as other financial institutions, are obligated to provide funding up to our maximum commitment level and are exposed to credit losses on the underlying assets after various credit enhancements. Enhancement can take various forms, including but not limited to overcollateralization, excess spread, subordinated classes of financial assets, guarantees or letters of credit. The amount of this enhancement varies but is generally sized to cover a multiple of loss experience. We do not consolidate these entities as we do not have decision making power over the relevant activities, including the investing and financing activities.

Other

Other structured entities include credit investment products and tax credit funds.

We use structured entities to generally transform credit derivatives into cash instruments, to distribute credit risk and to create customized credit products to meet investors' specific requirements. We enter into derivative contracts, including credit derivatives, to purchase protection from these entities (credit protection) and convert various risk factors such as yield, currency or credit risk of underlying assets to meet the needs of the investors. We act as sole arranger and swap provider for certain entities and, in some cases, fulfill other administrative functions for the entities. We do not consolidate these credit investment product entities as we do not have decision making power over the relevant activities, which include selection of the collateral and reference portfolio, and are not exposed to a majority of the benefits or risks of the entities.

We created certain funds to pass through tax credits received from underlying low-income housing or historic rehabilitation real estate projects to third parties (tax credit funds). We are sponsors of the tax credit funds as a result of our responsibility to manage the funds, arrange the financing, and perform the administrative duties of these tax credit funds. We do not consolidate the tax credit funds as the third-party investors in these funds have the decision making power to select the underlying investments and are exposed to the majority of the residual ownership and tax risks of the funds. We also purchase passive interests in renewable energy tax credit entities created and controlled by third parties. We do not consolidate these third party funds as we do not have decision making power over the relevant activities and our investments are managed as part of larger portfolios which are held for trading purposes.

Note 7 Structured entities (continued)

Other interests in unconsolidated structured entities

In the normal course of business, we buy and sell passive interests in certain third-party structured entities, including mutual funds, exchange traded funds, and government-sponsored asset backed securities vehicles. Our investments in these entities are managed as part of larger portfolios which are held for trading, liquidity or hedging purposes. We did not create or sponsor these entities and do not have any decision making power over their ongoing activities. Our maximum exposure to loss is limited to our on-balance sheet investments in these entities, which are not included in the table above. As at October 31, 2016, $51 billion of investments in these entities were included in Trading and AFS securities on our Consolidated Balance Sheet. Refer to Note 3 and Note 4 for further details on our investment securities.

Sponsored entities

We are a sponsor of certain structured entities in which we have interests but do not consolidate. In determining whether we are a sponsor of a structured entity, we consider both qualitative and quantitative factors, including the purpose and nature of the entity, our initial and continuing involvement and whether we hold subordinated interests in the entity. We are considered to be the sponsor of certain credit investment products, tax credit entities, RBC managed mutual funds and a commercial mortgage securitization vehicle. During the year ended October 31, 2016, we transferred commercial mortgages with a carrying amount of $660 million (October 31, 2015 – $195 million) to a sponsored securitization vehicle in which we did not have any interests as at the end of the reporting period.

Financial support provided to structured entities

During the years ended October 31, 2016, 2015 and 2014, we have not provided any financial or non-financial support to any consolidated or unconsolidated structured entities when we were not contractually obligated to do so. Furthermore, we have no intention to provide such support in the future.

Note 8 Derivative financial instruments and hedging activities

Derivative instruments are categorized as either financial or non-financial derivatives. Financial derivatives are financial contracts whose value is derived from an underlying interest rate, foreign exchange rate, credit risk, and equity or equity index. Non-financial derivatives are contracts whose value is derived from a precious metal, commodity instrument or index. The notional amount of derivatives represents the contract amount used as a reference point to calculate payments. Notional amounts are generally not exchanged by counterparties, and do not reflect our exposure at default.

Financial derivatives

Forwards and futures

Forward contracts are effectively non-standardized agreements that are transacted between counterparties in the OTC market, whereas futures are standardized contracts with respect to amounts and settlement dates, and are traded on regular futures exchanges. Examples of forwards and futures are described below.

Interest rate forwards (forward rate agreements) and futures are contractual obligations to buy or sell an interest-rate sensitive financial instrument on a predetermined future date at a specified price.

Foreign exchange forwards and futures are contractual obligations to exchange one currency for another at a specified price for settlement at a predetermined future date.

Equity forwards and futures are contractual obligations to buy or sell at a fixed value (the specified price) of an equity index, a basket of stocks or a single stock at a predetermined future date.

Swaps

Swaps are OTC contracts in which two counterparties exchange a series of cash flows based on agreed upon rates applied to a notional amount. Examples of swap agreements are described below.

Interest rate swaps are agreements where two counterparties exchange a series of payments based on different interest rates applied to a notional amount in a single currency. Cross currency swaps involve the exchange of fixed payments in one currency for the receipt of fixed payments in another currency. Cross currency interest rate swaps involve the exchange of both interest and notional amounts in two different currencies.

Equity swaps are contracts in which one counterparty agrees to pay or receive from the other cash flows based on changes in the value of an equity index, a basket of stocks or a single stock.

Options

Options are contractual agreements under which the seller (writer) grants the purchaser the right, but not the obligation, either to buy (call option) or sell (put option) a security, exchange rate, interest rate, or other financial instrument or commodity at a specified price, at or by a predetermined future date. The seller (writer) of an option can also settle the contract by paying the cash settlement value of the purchaser's right. The seller (writer) receives a premium from the purchaser for this right. The various option agreements that we enter into include but are not limited to interest rate options, foreign currency options, equity options and index options.

Credit derivatives

Credit derivatives are OTC contracts that transfer credit risk related to an underlying financial instrument (referenced asset) from one counterparty to another. Credit derivatives include credit default swaps, credit default baskets and total return swaps.

Credit default swaps provide protection against the decline in the value of the referenced asset as a result of specified credit events such as default or bankruptcy. They are similar in structure to an option, whereby the purchaser pays a premium to the seller of the credit default swap in return for payment contingent on a credit event affecting the referenced asset.

Credit default baskets are similar to credit default swaps except that the underlying referenced financial instrument is a group of assets instead of a single asset.

Total return swaps are contracts where one counterparty agrees to pay or receive from the other cash amounts based on changes in the value of a reference asset or group of assets, including any returns such as interest earned on these assets, in exchange for amounts that are based on prevailing market funding rates.

Other derivative products

Other contracts include precious metal, commodity, stable value and equity derivative contracts.

Non-financial derivatives
We also transact in non-financial derivative products including precious metal and commodity derivative contracts in both the OTC and exchange markets.

Derivatives issued for trading purposes
Most of our derivative transactions relate to sales and trading activities. Sales activities include the structuring and marketing of derivative products to clients to enable them to transfer, modify or reduce current or expected risks. Trading involves market-making, positioning and arbitrage activities. Market-making involves quoting bid and offer prices to other market participants with the intention of generating revenue based on spread and volume. Positioning involves managing market risk positions with the expectation of profiting from favourable movements in prices, rates or indices. Arbitrage activities involve identifying and profiting from price differentials between markets and products.

Derivatives issued for other-than-trading purposes
We also use derivatives for purposes other than trading, primarily for hedging, in conjunction with the management of interest rate, credit, equity and foreign exchange risk related to our funding, lending, investment activities and asset/liability management.

Interest rate swaps are used to manage our exposure to interest rate risk by modifying the repricing or maturity characteristics of existing and/or forecasted assets and liabilities, including funding and investment activities. Purchased options are used to hedge redeemable deposits and other options embedded in consumer products. We manage our exposure to foreign currency risk with cross currency swaps and foreign exchange forward contracts. We predominantly use credit derivatives to manage our credit exposures. We mitigate industry sector concentrations and single-name exposures related to our credit portfolio by purchasing credit derivatives to transfer credit risk to third parties.

Certain derivatives and cash instruments are specifically designated and qualify for hedge accounting. We apply hedge accounting to minimize volatility in earnings and capital caused by changes in interest rates or foreign exchange rates. Interest rate and currency fluctuations will either cause assets and liabilities to appreciate or depreciate in market value or cause variability in forecasted cash flows. When a hedging relationship is effective, gains, losses, revenue and expenses of the hedging instrument will offset the gains, losses, revenue and expenses of the hedged item. We assess and measure the effectiveness of a hedging relationship based on the change in the fair value or cash flows of the derivative hedging instrument relative to the change in the fair value or cash flows of the hedged item attributable to the hedged risk. When cash instruments are designated as hedges of foreign exchange risks, only changes in their value due to foreign exchange risk are included in the assessment and measurement of hedge effectiveness.

From time to time, we also enter into derivative transactions to economically hedge certain exposures that do not otherwise qualify for hedge accounting, or where hedge accounting is not considered economically feasible to implement. In such circumstances, changes in fair value are reflected in Non-interest income.

After-tax unrealized losses relating to de-designated hedges of $70 million (before-tax unrealized losses of $95 million) included in Other components of equity as at October 31, 2016, are expected to be reclassified to Net interest income within the next 12 months.

The following table presents the fair values of the derivative and non-derivative instruments categorized by their hedging relationships, as well as derivatives that are not designated in hedging relationships.

Derivatives and non-derivative instruments

	As at							
	October 31, 2016				October 31, 2015			
	Designated as hedging instruments in hedging relationships				Designated as hedging instruments in hedging relationships			
(Millions of Canadian dollars)	**Cash flow hedges**	**Fair value hedges**	**Net investment hedges**	**Not designated in a hedging relationship**	Cash flow hedges	Fair value hedges	Net investment hedges	Not designated in a hedging relationship
Assets								
Derivative instruments	**$ 546**	**$ 1,686**	**$ 183**	**$ 116,529**	$ 842	$ 1,814	$ 167	$ 102,803
Liabilities								
Derivative instruments	**1,266**	**430**	**113**	**114,741**	1,629	311	49	105,871
Non-derivative instruments	**–**	**–**	**19,982**	**n.a.**	–	–	18,804	n.a.

n.a. not applicable

Results of hedge activities recorded in Net income and Other comprehensive income

	For the year ended		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014
Fair value hedges			
Gains (losses) on hedging instruments (1)	**$ (235)**	$ 313	$ 216
Gains (losses) on hedged items attributable to the hedged risk (1)	**135**	(424)	(329)
Ineffective portion (1) (2)	**(100)**	(111)	(113)
Cash flow hedges			
Ineffective portion (1)	**1**	3	(13)
Effective portion (3)	**(35)**	(541)	(108)
Reclassified to income during the period (4) (5)	**(71)**	(447)	(38)
Net investment hedges			
Ineffective portion (1)	**–**	(1)	1
Foreign currency gains (losses) (3)	**147**	5,885	2,743
Gains (losses) from hedges (3)	**113**	(3,223)	(1,585)

(1) Amounts are recorded in Non-interest income.
(2) Amounts include losses of $97 million (October 31, 2015 – $106 million; October 31, 2014 – $109 million) that are excluded from the assessment of hedge effectiveness and are offset by economic hedges.
(3) Amounts are included in OCI, net of taxes.
(4) Amounts are recorded in Net interest income.
(5) After-tax losses of $52 million were reclassified from Other components of equity to income during the year ended October 31, 2016 (October 31, 2015 – $330 million; October 31, 2014 – $28 million).

Notional amount of derivatives by term to maturity (absolute amounts)

(Millions of Canadian dollars)	As at October 31, 2016					
	Term to maturity					
	Within 1 year	1 to 5 years	Over 5 years (1)	Total	Trading	Other than Trading
Over-the-counter contracts						
Interest rate contracts						
Forward rate agreements	$ 522,944	$ 9,121	$ –	$ 532,065	$ 532,065	$ –
Swaps	1,991,365	3,485,607	2,285,420	7,762,392	7,464,144	298,248
Options purchased	114,519	161,584	70,160	346,263	346,263	–
Options written	97,283	182,233	71,503	351,019	351,019	–
Foreign exchange contracts						
Forward contracts	1,288,656	44,980	939	1,334,575	1,314,103	20,472
Cross currency swaps	8,869	34,931	30,866	74,666	69,626	5,040
Cross currency interest rate swaps	272,029	544,195	251,371	1,067,595	1,013,958	53,637
Options purchased	28,601	16,538	4,619	49,758	49,758	–
Options written	28,676	14,723	4,924	48,323	48,323	–
Credit derivatives (2)	1,581	10,314	4,306	16,201	15,842	359
Other contracts	58,863	59,133	22,355	140,351	136,205	4,146
Exchange-traded contracts						
Interest rate contracts						
Futures – long positions	26,076	14,496	3	40,575	40,575	–
Futures – short positions	35,269	19,551	–	54,820	54,820	–
Options purchased	18,196	165	–	18,361	18,361	–
Options written	10,978	–	–	10,978	10,978	–
Foreign exchange contracts						
Futures – long positions	312	–	–	312	312	–
Futures – short positions	423	3	–	426	426	–
Other contracts	178,615	55,820	617	235,052	235,052	–
	$ 4,683,255	$ 4,653,394	$ 2,747,083	$ 12,083,732	$ 11,701,830	$ 381,902

(Millions of Canadian dollars)	As at October 31, 2015					
	Term to maturity					
	Within 1 year	1 to 5 years	Over 5 years (1)	Total	Trading	Other than Trading
Over-the-counter contracts						
Interest rate contracts						
Forward rate agreements	$ 602,072	$ 26,334	$ –	$ 628,406	$ 628,406	$ –
Swaps	1,717,989	3,946,377	2,482,659	8,147,025	7,922,567	224,458
Options purchased	106,908	99,994	34,649	241,551	241,551	–
Options written	107,213	108,237	44,268	259,718	259,718	–
Foreign exchange contracts						
Forward contracts	1,273,434	45,591	1,275	1,320,300	1,271,428	48,872
Cross currency swaps	7,404	24,711	31,010	63,125	59,423	3,702
Cross currency interest rate swaps	246,668	609,751	323,403	1,179,822	1,129,357	50,465
Options purchased	25,921	13,773	4,274	43,968	43,968	–
Options written	24,933	12,168	4,677	41,778	41,778	–
Credit derivatives (2)	1,250	9,759	3,947	14,956	14,286	670
Other contracts	75,723	57,344	24,819	157,886	154,504	3,382
Exchange-traded contracts						
Interest rate contracts						
Futures – long positions	18,934	10,469	10	29,413	29,413	–
Futures – short positions	36,589	25,939	2	62,530	62,530	–
Options purchased	17,282	9,119	–	26,401	26,401	–
Options written	1,281	956	–	2,237	2,237	–
Foreign exchange contracts						
Futures – long positions	308	–	–	308	308	–
Futures – short positions	714	13	–	727	727	–
Other contracts	170,464	43,345	1,197	215,006	215,006	–
	$ 4,435,087	$ 5,043,880	$ 2,956,190	$ 12,435,157	$ 12,103,608	$ 331,549

(1) Includes contracts maturing in over 10 years with a notional value of $883 billion (October 31, 2015 – $876 billion). The related gross positive replacement cost is $79 billion (October 31, 2015 – $60 billion).
(2) Credit derivatives with a notional value of $0.4 billion (October 31, 2015 – $0.7 billion) are economic hedges. Trading credit derivatives comprise protection purchased of $10.1 billion (October 31, 2015 – $8.9 billion) and protection sold of $5.7 billion (October 31, 2015 – $5.3 billion).

The following tables indicate the periods when the cash flows are expected to occur and when they are expected to affect profit or loss for cash flow hedges.

	As at October 31, 2016					
(Millions of Canadian dollars)	**Within 1 year**	**1 to 2 years**	**2 to 3 years**	**3 to 5 years**	**Over 5 years**	**Total**
Cash inflows from assets	**$ 192**	**$ 175**	**$ 122**	**$ 90**	**$ 39**	**$ 618**
Cash outflows from liabilities	**(387)**	**(789)**	**(559)**	**(3,136)**	**(77)**	**(4,948)**
Net cash flows	**$ (195)**	**$ (614)**	**$ (437)**	**$ (3,046)**	**$ (38)**	**$(4,330)**

	As at October 31, 2015					
(Millions of Canadian dollars)	Within 1 year	1 to 2 years	2 to 3 years	3 to 5 years	Over 5 years	Total
Cash inflows from assets	$ 156	$ 189	$ 192	$ 243	$ 12	$ 792
Cash outflows from liabilities	(1,004)	(282)	(730)	(3,556)	(151)	(5,723)
Net cash flows	$ (848)	$ (93)	$ (538)	$ (3,313)	$ (139)	$(4,931)

Fair value of derivative instruments

	As at							
	October 31, 2016				October 31, 2015			
	Average fair value for year ended (1)		**Year end fair value**		Average fair value for year ended (1)		Year end fair value	
(Millions of Canadian dollars)	**Positive**	**Negative**	**Positive**	**Negative**	Positive	Negative	Positive	Negative
Held or issued for trading purposes								
Interest rate contracts								
Forward rate agreements	**$ 369**	**$ 387**	**$ 267**	**$ 244**	$ 340	$ 303	$ 323	$ 291
Swaps	**156,800**	**149,440**	**146,464**	**138,742**	136,398	130,623	135,901	129,829
Options purchased	**4,008**	**–**	**4,455**	**–**	4,155	–	3,330	–
Options written	**–**	**5,420**	**–**	**5,601**	–	5,380	–	4,573
	161,177	**155,247**	**151,186**	**144,587**	140,893	136,306	139,554	134,693
Foreign exchange contracts								
Forward contracts	**18,604**	**18,717**	**18,565**	**18,853**	16,505	16,294	11,599	11,477
Cross currency swaps	**4,556**	**4,191**	**5,423**	**4,438**	3,039	3,254	3,844	4,109
Cross currency interest rate swaps	**25,010**	**28,834**	**27,499**	**29,165**	21,445	27,584	19,931	26,385
Options purchased	**2,123**	**–**	**2,084**	**–**	3,026	–	2,337	–
Options written	**–**	**1,830**	**–**	**1,857**	–	2,486	–	1,898
	50,293	**53,572**	**53,571**	**54,313**	44,015	49,618	37,711	43,869
Credit derivatives	**137**	**178**	**191**	**242**	130	200	94	153
Other contracts	**7,640**	**10,175**	**6,662**	**8,994**	9,431	12,868	10,704	12,866
	219,247	**219,172**	**211,610**	**208,136**	194,469	198,992	188,063	191,581
Held or issued for other-than-trading purposes								
Interest rate contracts								
Swaps			**2,588**	**1,471**			2,923	1,585
Options purchased			**–**	**–**			–	–
Options written			**–**	**–**			–	–
			2,588	**1,471**			2,923	1,585
Foreign exchange contracts								
Forward contracts			**257**	**338**			274	253
Cross currency swaps			**314**	**542**			20	506
Cross currency interest rate swaps			**2,636**	**2,286**			3,107	2,080
			3,207	**3,166**			3,401	2,839
Credit derivatives			**–**	**21**			–	18
Other contracts			**113**	**113**			69	69
			5,908	**4,771**			6,393	4,511
Total gross fair values before netting			**217,518**	**212,907**			194,456	196,092
Valuation adjustments determined on a pooled basis			**(1,432)**	**(126)**			(1,303)	(272)
Impact of netting agreements that qualify for balance sheet offset			**(97,142)**	**(96,231)**			(87,527)	(87,960)
			118,944	**116,550**			105,626	107,860
Impact of netting agreements that do not qualify for balance sheet offset (2)			**(79,296)**	**(79,296)**			(71,833)	(71,833)
			$ 39,648	**$ 37,254**			$ 33,793	$ 36,027

(1) Average fair value amounts are calculated based on monthly balances.
(2) Additional impact of offsetting credit exposures on contracts that do not qualify for balance sheet offset.

Fair value of derivative instruments by term to maturity

(Millions of Canadian dollars)	As at October 31, 2016 Less than 1 year	1 to 5 years	Over 5 years	Total	As at October 31, 2015 Less than 1 year	1 to 5 years	Over 5 years	Total
Derivative assets	**$ 30,475**	**$ 39,357**	**$ 49,112**	**$ 118,944**	$ 24,920	$ 35,883	$ 44,823	$ 105,626
Derivative liabilities	**30,962**	**39,507**	**46,081**	**116,550**	26,092	40,380	41,388	107,860

Derivative-related credit risk

Credit risk from derivative transactions is generated by the potential for the counterparty to default on its contractual obligations when one or more transactions have a positive market value to us. Therefore, derivative-related credit risk is represented by the positive fair value of the instrument and is normally a small fraction of the contract's notional amount.

We subject our derivative transactions to the same credit approval, limit and monitoring standards that we use for managing other transactions that create credit exposure. This includes evaluating the creditworthiness of counterparties, and managing the size, diversification and maturity structure of the portfolio. Credit utilization for all products is compared with established limits on a continual basis and is subject to a standard exception reporting process. We use a single internal rating system for all credit risk exposure. In most cases, these internal ratings approximate the external risk ratings of public rating agencies.

Netting is a technique that can reduce credit exposure from derivatives and is generally facilitated through the use of master netting agreements. A master netting agreement provides for a single net settlement of all financial instruments covered by the agreement in the event of default. However, credit risk is reduced only to the extent that our financial obligations to the same counterparty can be set off against obligations of the counterparty to us. We maximize the use of master netting agreements to reduce derivative-related credit exposure. Our overall exposure to credit risk that is reduced through master netting agreements may change substantially following the reporting date as the exposure is affected by each transaction subject to the agreement as well as by changes in underlying market rates. Measurement of our credit exposure arising out of derivative transactions is reduced to reflect the effects of netting in cases where the enforceability of that netting is supported by appropriate legal analysis as documented in our trading credit risk policies.

The use of collateral is another significant credit mitigation technique for managing derivative-related counterparty credit risk. Mark-to-market provisions in our agreements with some counterparties, typically in the form of a Credit Support Annex, provide us with the right to request that the counterparty pay down or collateralize the current market value of its derivatives positions when the value passes a specified threshold amount.

Replacement cost represents the total fair value of all outstanding contracts in a gain position after factoring in the master netting agreements. The credit equivalent amount is defined as the sum of the replacement cost plus an add-on amount for potential future credit exposure as defined by OSFI. The risk-weighted amount is determined by applying the standard OSFI defined measures of counterparty risk to the credit equivalent amount.

Derivative-related credit risk

(Millions of Canadian dollars)	As at October 31, 2016 (1) Replacement cost	Credit equivalent amount (2)	Risk-weighted equivalent (3)	October 31, 2015 (1) Replacement cost	Credit equivalent amount (2)	Risk-weighted equivalent (3)
Over-the-counter contracts						
Interest rate contracts						
Forward rate agreements	**$ 232**	**$ 250**	**$ 53**	$ 182	$ 233	$ 50
Swaps	**15,118**	**27,214**	**5,429**	14,747	27,688	5,197
Options purchased	**334**	**1,092**	**662**	340	700	446
Foreign exchange contracts						
Forward contracts	**6,914**	**12,952**	**3,896**	5,041	11,254	3,202
Swaps	**13,763**	**12,492**	**3,790**	7,686	9,809	3,878
Options purchased	**416**	**1,045**	**456**	322	547	276
Credit derivatives (4)	**31**	**920**	**188**	34	913	204
Other contracts	**1,409**	**6,188**	**3,463**	2,499	7,539	4,320
Exchange traded contracts	**2,933**	**11,756**	**235**	4,245	12,048	241
	$ 41,150	**$ 73,909**	**$ 18,172**	$ 35,096	$ 70,731	$ 17,814

(1) The amounts presented are net of master netting agreements in accordance with Basel III.
(2) The total credit equivalent amount includes collateral applied of $21 billion (October 31, 2015 – $17.8 billion).
(3) The risk-weighted balances are calculated in accordance with Basel III.
(4) Excludes credit derivatives issued for other-than-trading purposes related to bought protection.

Replacement cost of derivative instruments by risk rating and by counterparty type

(Millions of Canadian dollars)	As at October 31, 2016 Risk rating (1) AAA, AA	A	BBB	BB or lower	Total	Counterparty type (2) Banks	OECD governments	Other	Total
Gross positive replacement cost	**$ 37,119**	**$ 151,992**	**$ 20,634**	**$ 7,773**	**$ 217,518**	**$ 62,112**	**$ 21,824**	**$ 133,582**	**$ 217,518**
Impact of master netting agreements	**20,704**	**139,912**	**14,255**	**1,567**	**176,438**	**52,535**	**9,494**	**114,409**	**176,438**
Replacement cost (after netting agreements)	**$ 16,415**	**$ 12,080**	**$ 6,379**	**$ 6,206**	**$ 41,080**	**$ 9,577**	**$ 12,330**	**$ 19,173**	**$ 41,080**

	As at October 31, 2015								
	Risk rating (1)					Counterparty type (2)			
(Millions of Canadian dollars)	AAA, AA	A	BBB	BB or lower	Total	Banks	OECD governments	Other	Total
Gross positive replacement cost	$ 30,824	$ 136,843	$ 16,191	$ 10,598	$ 194,456	$ 56,631	$ 16,374	$ 121,451	$ 194,456
Impact of master netting agreements	22,751	124,603	9,260	2,746	159,360	45,401	10,971	102,988	159,360
Replacement cost (after netting agreements)	$ 8,073	$ 12,240	$ 6,931	$ 7,852	$ 35,096	$ 11,230	$ 5,403	$ 18,463	$ 35,096

(1) Our internal risk ratings for major counterparty types approximate those of public ratings agencies. Ratings of AAA, AA, A and BBB represent investment grade ratings and ratings of BB or lower represent non-investment grade ratings.

(2) Counterparty type is defined in accordance with the capital adequacy requirements of OSFI.

Note 9 Premises and equipment

(Millions of Canadian dollars)	Land	Buildings	Computer equipment	Furniture, fixtures and other equipment	Leasehold improvements	Work in process	Total
Cost							
Balance at October 31, 2015	**$ 123**	**$ 1,294**	**$ 1,508**	**$ 1,292**	**$ 2,464**	**$ 168**	**$ 6,849**
Additions (1)	**–**	**1**	**156**	**35**	**46**	**249**	**487**
Acquisitions through business combination	**52**	**94**	**55**	**2**	**63**	**51**	**317**
Transfers from work in process	**–**	**14**	**83**	**40**	**137**	**(274)**	**–**
Disposals	**(3)**	**(15)**	**(38)**	**(47)**	**(111)**	**–**	**(214)**
Foreign exchange translation	**–**	**1**	**(17)**	**(4)**	**(8)**	**(1)**	**(29)**
Other	**(1)**	**(10)**	**(61)**	**34**	**(25)**	**(61)**	**(124)**
Balance at October 31, 2016	**$ 171**	**$ 1,379**	**$ 1,686**	**$ 1,352**	**$ 2,566**	**$ 132**	**$ 7,286**
Accumulated depreciation							
Balance at October 31, 2015	**$ –**	**$ 534**	**$ 1,070**	**$ 875**	**$ 1,642**	**$ –**	**$ 4,121**
Depreciation	**–**	**48**	**219**	**126**	**180**	**–**	**573**
Disposals	**–**	**(4)**	**(38)**	**(40)**	**(107)**	**–**	**(189)**
Foreign exchange translation	**–**	**(1)**	**(13)**	**(8)**	**(7)**	**–**	**(29)**
Other	**–**	**(7)**	**(29)**	**8**	**2**	**–**	**(26)**
Balance at October 31, 2016	**$ –**	**$ 570**	**$ 1,209**	**$ 961**	**$ 1,710**	**$ –**	**$ 4,450**
Net carrying amount at October 31, 2016	**$ 171**	**$ 809**	**$ 477**	**$ 391**	**$ 856**	**$ 132**	**$ 2,836**

(Millions of Canadian dollars)	Land	Buildings	Computer equipment	Furniture, fixtures and other equipment	Leasehold improvements	Work in process	Total
Cost							
Balance at October 31, 2014	$ 137	$ 1,347	$ 1,278	$ 1,248	$ 2,192	$ 208	$ 6,410
Additions (1)	–	4	195	53	82	344	678
Transfers from work in process	–	11	52	61	212	(336)	–
Disposals	(25)	(95)	(101)	(108)	(98)	–	(427)
Foreign exchange translation	7	18	54	30	69	4	182
Other	4	9	30	8	7	(52)	6
Balance at October 31, 2015	$ 123	$ 1,294	$ 1,508	$ 1,292	$ 2,464	$ 168	$ 6,849
Accumulated depreciation							
Balance at October 31, 2014	$ –	$ 499	$ 925	$ 839	$ 1,463	$ –	$ 3,726
Depreciation	–	44	197	103	183	–	527
Disposals	–	(8)	(98)	(96)	(64)	–	(266)
Foreign exchange translation	–	6	42	21	42	–	111
Other	–	(7)	4	8	18	–	23
Balance at October 31, 2015	$ –	$ 534	$ 1,070	$ 875	$ 1,642	$ –	$ 4,121
Net carrying amount at October 31, 2015	$ 123	$ 760	$ 438	$ 417	$ 822	$ 168	$ 2,728

(1) At October 31, 2016, we had total contractual commitments of $301 million to acquire premises and equipment (October 31, 2015 – $157 million; October 31, 2014 – $216 million).

Note 10 Goodwill and other intangible assets

Goodwill

The following table presents changes in the carrying amount of goodwill by CGU for the years ended October 31, 2016 and 2015.

(Millions of Canadian dollars)	Canadian Banking	Caribbean Banking	Canadian Wealth Management	Global Asset Management	U.S. Wealth Management (including City National)	International Wealth Management	Insurance	Investor & Treasury Services	Capital Markets	Total
At October 31, 2014	$ 2,527	$ 1,593	$ 558	$ 2,042	$ 582	$ 141	$ 118	$ 149	$ 937	$ 8,647
Dispositions	–	(23)	–	–	–	(15)	–	–	–	(38)
Currency translations	–	250	21	177	91	16	–	–	125	680
At October 31, 2015	$ 2,527	$ 1,820	$ 579	$ 2,219	$ 673	$ 142	$ 118	$ 149	$ 1,062	$ 9,289
Acquisition	**–**	**–**	**–**	**–**	**2,113**	**–**	**–**	**–**	**–**	**2,113**
Dispositions	**–**	**–**	**–**	**–**	**–**	**–**	**(6)**	**(1)**	**–**	**(7)**
Currency translations	**–**	**(49)**	**3**	**(256)**	**68**	**(27)**	**–**	**–**	**22**	**(239)**
At October 31, 2016	**$ 2,527**	**$ 1,771**	**$ 582**	**$ 1,963**	**$ 2,854**	**$ 115**	**$ 112**	**$ 148**	**$ 1,084**	**$ 11,156**

We perform our annual impairment test by comparing the carrying amount of each CGU to its recoverable amount. The recoverable amount of a CGU is represented by its value in use, except in circumstances where the carrying amount of a CGU exceeds its value in use. In such cases, we determine the CGU's fair value less costs of disposal and its recoverable amount is the greater of its value in use and fair value less costs of disposal. Our annual impairment test is performed as at August 1.

In our 2016 and 2015 annual impairment tests, the recoverable amounts of our Caribbean Banking and International Wealth Management CGUs were based on fair value less costs of disposal. The recoverable amounts of all other CGUs tested were based on value in use.

Value in use

We calculate value in use using a five-year discounted cash flow method, with the exception of our U.S. Wealth Management (including City National) CGU where cash flow projections covering a ten-year period were used, which more closely aligns with the strategic growth plan resulting from the acquisition of City National. Future cash flows are based on financial plans agreed by management, estimated based on forecast results, business initiatives, capital required to support future cash flows and returns to shareholders. Key drivers of future cash flows include net interest margins and average interest-earning assets. The values assigned to these drivers over the forecast period are based on past experience, external and internal economic forecasts, and management's expectations of the impact of economic conditions on our financial results. Beyond the initial cash flow projection period, cash flows are assumed to increase at a constant rate using a nominal long-term growth rate (terminal growth rate). Terminal growth rates are based on the current market assessment of gross domestic product and inflation for the countries within which the CGU operates. The discount rates used to determine the present value of each CGU's projected future cash flows are based on the bank-wide cost of capital, adjusted for the risks to which each CGU is exposed. 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).

The estimation of value in use involves significant judgment in the determination of inputs to the discounted cash flow model and is most sensitive to changes in future cash flows, discount rates and terminal growth rates applied to cash flows beyond the forecast period. These key inputs and assumptions used to determine the recoverable amount of each CGU using value in use were tested for sensitivity by applying a reasonably possible change to those assumptions. The post-tax discount rates were increased by 1%, terminal growth rates were decreased by 1%, and future cash flows were reduced by 10%. As at August 1, 2016, no change in an individual key input or assumption, as described, would result in a CGU's carrying amount exceeding its recoverable amount based on value in use.

The terminal growth rates and pre-tax discount rates used in our discounted cash flow models are summarized below.

	As at			
	August 1, 2016		August 1, 2015	
	Discount rate (1)	**Terminal growth rate**	Discount rate (1)	Terminal growth rate
Group of cash generating units				
Canadian Banking	**10.0%**	**3.0%**	10.6%	3.0%
Caribbean Banking	**12.1**	**4.3**	13.2	4.3
Canadian Wealth Management	**11.2**	**3.0**	11.9	3.0
Global Asset Management	**11.1**	**3.0**	11.7	3.0
U.S. Wealth Management (including City National)	**13.6**	**3.0**	16.3	3.0
International Wealth Management	**9.6**	**3.0**	11.9	3.0
Insurance	**10.9**	**3.0**	11.2	3.0
Investor & Treasury Services	**12.0**	**3.0**	12.4	3.0
Capital Markets	**14.1**	**3.0**	15.7	3.0

(1) Pre-tax discount rates are determined implicitly based on post-tax discount rates.

Fair value less costs of disposal – Caribbean Banking
For our Caribbean Banking CGU, we calculated fair value less costs of disposal using a discounted cash flow method that projects future cash flows over a 5-year period. Cash flows are based on management forecasts, adjusted to approximate the considerations of a prospective third-party buyer. Cash flows beyond the initial 5-year period are assumed to increase at a constant rate using a nominal long-term growth rate. Future cash flows, terminal growth rates, and discount rates are based on the same factors noted above. This fair value measurement is categorized as level 3 in the fair value hierarchy as certain significant inputs are not observable.

The estimation of fair value less costs of disposal involves significant judgment in the determination of inputs to the discounted cash flow model and is most sensitive to changes in future cash flows, discount rates and terminal growth rates applied to cash flows beyond the forecast period. These key inputs and assumptions were tested for sensitivity by applying a reasonably possible change to those assumptions. The post-tax discount rates were increased by 1%, terminal growth rates were decreased by 1%, and future cash flows were reduced by 10%. As at August 1, 2016, no reasonably possible change in an individual key input or assumption, as described, would result in the CGU's carrying amount exceeding its recoverable amount based on fair value less costs of disposal.

Fair value less costs of disposal – International Wealth Management
For our International Wealth Management CGU, we calculated fair value less costs of disposal using a multiples-based approach. Each business within the CGU was valued using either a Price-to-assets-under-administration (P/AUA) or Price-to-revenue (P/Rev) multiple, as appropriate, to reflect the considerations of a prospective third-party buyer. In 2016 and 2015, we applied a P/AUA multiple of 2.5% to AUA as at August 1 and a P/Rev multiple of 2.5x to revenue for the 12 months preceding the testing date. These multiples represent our best estimate from a range of reasonably possible inputs based on precedent transactions for comparable businesses. This fair value measurement is categorized as level 3 in the fair value hierarchy as certain significant inputs are not observable.

The estimation of fair value less costs of disposal involves significant judgment in the determination of the appropriate valuation approach and inputs and is most sensitive to changes in the P/AUA and P/Rev multiples. These key inputs were tested for sensitivity by reducing each multiple to the low end of the range of reasonably possible inputs considered. As at August 1, 2016, no reasonably possible change in an individual key input or assumption, as described, would result in the CGU's carrying amount exceeding its recoverable amount based on fair value less costs of disposal.

Other intangible assets
The following table presents the carrying amount of our other intangible assets.

	As at October 31, 2016					
(Millions of Canadian dollars)	Internally generated software	Other software	Core deposit intangibles	Customer list and relationships	In process software	Total
Gross carrying amount						
Balance at October 31, 2015	$ 3,929	$ 1,193	$ 194	$ 1,538	$ 580	$ 7,434
Additions	11	58	–	–	765	834
Acquisitions through business combination	23	47	1,558	322	–	1,950
Transfers	569	34	–	–	(603)	–
Dispositions	(10)	(6)	–	–	–	(16)
Impairment losses	–	–	–	–	–	–
Currency translations	(33)	19	32	(99)	(2)	(83)
Other changes	(54)	44	–	–	38	28
Balance at October 31, 2016	$ 4,435	$ 1,389	$ 1,784	$ 1,761	$ 778	$ 10,147
Accumulated amortization						
Balance at October 31, 2015	$ (2,750)	$ (893)	$ (194)	$ (783)	$ –	$ (4,620)
Amortization charge for the year	(560)	(97)	(158)	(155)	–	(970)
Dispositions	7	5	–	–	–	12
Impairment losses	–	–	–	–	–	–
Currency translations	31	(18)	4	64	–	81
Other changes	49	(51)	–	–	–	(2)
Balance at October 31, 2016	$ (3,223)	$ (1,054)	$ (348)	$ (874)	$ –	$ (5,499)
Net balance, at October 31, 2016	$ 1,212	$ 335	$ 1,436	$ 887	$ 778	$ 4,648

(Millions of Canadian dollars)	As at October 31, 2015					
	Internally generated software	Other software	Core deposit intangibles	Customer list and relationships	In process software	Total
Gross carrying amount						
Balance at October 31, 2014	$ 3,402	$ 1,186	$ 168	$ 1,511	$ 487	$ 6,754
Additions	50	75	–	–	615	740
Transfers	503	19	–	–	(522)	–
Dispositions	(98)	(132)	–	(30)	–	(260)
Impairment losses	–	–	–	(22)	–	(22)
Currency translations	84	49	26	79	17	255
Other changes	(12)	(4)	–	–	(17)	(33)
Balance at October 31, 2015	$ 3,929	$ 1,193	$ 194	$ 1,538	$ 580	$ 7,434
Accumulated amortization						
Balance at October 31, 2014	$ (2,293)	$ (888)	$ (151)	$ (647)	$ –	$ (3,979)
Amortization charge for the year	(494)	(81)	(18)	(119)	–	(712)
Dispositions	97	125	–	9	–	231
Impairment losses	(3)	–	–	18	–	15
Currency translations	(60)	(30)	(25)	(41)	–	(156)
Other changes	3	(19)	–	(3)	–	(19)
Balance at October 31, 2015	$ (2,750)	$ (893)	$ (194)	$ (783)	$ –	$ (4,620)
Net balance, at October 31, 2015	$ 1,179	$ 300	$ –	$ 755	$ 580	$ 2,814

Note 11 Significant acquisition and dispositions

Acquisition

Wealth Management

On November 2, 2015, we completed the acquisition of City National. City National's business gives us an expansion platform for long-term growth in the U.S. and the opportunity to enhance and complement our existing U.S. businesses in line with our strategic goals.

Total consideration of $7.1 billion (US$5.5 billion) at the date of close included $3.4 billion (US$2.6 billion) in cash, 41.6 million RBC common shares issued at a price of US$57.16 per share for a total value of $3.1 billion (US$2.4 billion), US$275 million of first preferred shares (Series C-1 and Series C-2), with a fair value of $380 million (US$290 million), as well as share-based compensation amounts of $204 million (US$156 million), including the conversion of 3.8 million stock options with a fair value of $147 million (US$112 million), based on the Black-Scholes model.

Our purchase price allocation assigns $47.8 billion to assets and $44.7 billion to liabilities on the acquisition date. Goodwill of $2.1 billion reflects the expected synergies from the combined U.S. Wealth Management operations, expected growth of the platform, and the ability to cross sell products between segments. Goodwill is not expected to be deductible for tax purposes. The following table presents the fair value of the assets acquired and liabilities assumed as at the acquisition date.

(Millions of Canadian dollars, except percentage)	
Percentage of shares acquired	100%
Purchase consideration	$ 7,138
Fair value of identifiable assets acquired	
Cash and due from banks	$ 499
Interest-bearing deposits with banks	2,779
Securities	
Trading	321
Available-for-sale	7,409
Held-to-maturity	4,723
Loans (1)	
Retail	9,597
Wholesale	20,555
Other assets	1,885
Total fair value of identifiable assets acquired	$ 47,768
Fair value of identifiable liabilities assumed	
Deposits	
Personal	10,481
Business and government	31,593
Bank	169
Other liabilities	2,450
Total fair value of identifiable liabilities assumed	$ 44,693
Fair value of identifiable net assets acquired	$ 3,075
Intangible assets (2)	1,950
Goodwill	2,113
Total purchase consideration	$ 7,138

(1) The fair value of loans reflects estimates of incurred and expected future credit losses at the acquisition date and interest rate premiums or discounts relative to prevailing market rates. Gross contractual receivables amount to $30.1 billion.

(2) Intangible assets primarily include core deposits and customer relationships which are amortized on a straight-line basis over an estimated useful life of 10 years.

During the year, we revised our preliminary purchase price allocation, primarily due to additional information on certain tax benefits relating to City National's prior business acquisitions. As a result, goodwill was reduced by $233 million.

Since the acquisition date, City National increased our 2016 consolidated revenue and net income by $1,988 million and $290 million, respectively. All results of operations are included in our Wealth Management segment and goodwill is allocated to our U.S. Wealth Management (including City National) CGU (previously called U.S. Wealth Management).

Dispositions

Insurance

On July 1, 2016, we completed the sale of RBC General Insurance Company, which includes certain home and auto insurance manufacturing businesses, including claims, underwriting and product development capabilities, to Aviva Canada Inc. We also entered into an exclusive 15-year distribution agreement with Aviva Canada Inc. to market and sell a full suite of property and casualty insurance products to our existing and new clients. As a result of the transaction, we recorded a pre-tax gain on disposal of $287 million in Non-interest income – Other ($235 million after-tax).

Investor & Treasury Services

On October 21, 2016, we completed the sale of RBC Investor Services España S.A.U. and its wholly-owned subsidiary to Banco Inversis S.A. The transaction did not have a significant impact on Non-interest income.

Wealth Management

On November 4, 2015, we entered into a definitive agreement to sell our trust, custody and fund administration business in the Caribbean to SMP Group Limited. The transaction is subject to customary closing conditions, including the receipt of regulatory approvals. As a result of the disposition, the assets and liabilities included in the disposal group are classified as held for sale, measured at the lower of their carrying amount and fair value less costs to sell and presented in Other assets and Other liabilities. The major classes of assets, liabilities and equity that are included in the disposal group are not significant.

On August 28, 2015, we completed the sale of Royal Bank of Canada (Suisse) SA, announced on July 14, 2015. The transaction did not have a significant impact on our Consolidated Statements of Income.

Personal & Commercial Banking

On July 31, 2015, we completed the sale of RBC Royal Bank (Suriname) N.V., announced on April 1, 2015. As a result of the transaction, we recorded a total loss on disposal of $19 million (before and after-tax), consisting of a loss of $23 million in the second quarter included in Non-interest expense – Other, and a gain of $4 million in the third quarter primarily relating to foreign currency translation gains reclassified from Other components of equity.

On June 27, 2014, we completed the sale of RBC Royal Bank (Jamaica) Limited and RBTT Securities Jamaica Limited to Sagicor Group Jamaica Limited, as announced on January 29, 2014. As a result of the transaction, we recorded a total loss on disposal of $100 million (before and after-tax), including a loss of $60 million in the first quarter and $40 million primarily relating to foreign currency translation losses reclassified from Other components of equity in the third quarter of 2014. The loss on disposal has been included in Non-Interest expense – Other.

Note 12 Joint ventures and associated companies

The following table summarizes the carrying value of our interests in joint ventures and associated companies accounted for under the equity method as well as our share of the income of those entities.

	Joint ventures			Associated companies		
	As at and for the year ended					
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014	**October 31 2016**	October 31 2015	October 31 2014
Carrying amount	**$ 151**	$ 223	$ 180	**$ 465**	$ 137	$ 115
Share of:						
Net income	**124**	119	131	**52**	30	31
Other comprehensive income	**(5)**	8	5	**–**	2	–
	$ 119	$ 127	$ 136	**$ 52**	$ 32	$ 31

We do not have any joint ventures or associated companies that are individually material to our financial results.

During the year ended October 31, 2016, we reversed previously recognized impairment losses of $8 million with respect to our interests in associated companies (October 31, 2015 – impairment losses of $3 million; October 31, 2014 – $nil) and recognized no gains on sales of associated companies (October 31, 2015 – $nil; October 31, 2014 – $62 million).

Certain of our subsidiaries, joint ventures and associates are subject to regulatory requirements of the jurisdictions in which they operate. When these subsidiaries, joint ventures and associates are subject to such requirements, they may be restricted from transferring to us our share of their assets in the form of cash dividends, loans or advances. As at October 31, 2016, restricted net assets of these subsidiaries, joint ventures and associates were $28.4 billion (October 31, 2015 - $30.8 billion).

Note 13 Other assets

(Millions of Canadian dollars)	As at October 31 2016	October 31 2015
Cash collateral	**$ 18,979**	$ 18,619
Margin deposits	**4,308**	4,399
Receivable from brokers, dealers and clients	**2,458**	2,608
Accounts receivable and prepaids	**3,487**	2,843
Investments in joint ventures and associates	**616**	360
Employee benefit assets	**29**	245
Insurance-related assets		
Collateral loans	**1,198**	1,176
Policy loans	**98**	106
Reinsurance assets	**713**	683
Other	**43**	576
Deferred income tax asset	**2,827**	2,072
Taxes receivable	**2,264**	2,343
Accrued interest receivable	**1,870**	1,757
Precious metals	**306**	106
Other	**2,875**	3,979
	$ 42,071	$ 41,872

Note 14 Deposits

The following table details our deposit liabilities.

	As at							
	October 31, 2016				October 31, 2015			
(Millions of Canadian dollars)	**Demand** (1)	**Notice** (2)	**Term** (3)	**Total**	Demand (1)	Notice (2)	Term (3)	Total
Personal	**$ 128,206**	**$ 46,096**	**$ 76,248**	**$ 250,550**	$ 128,101	$ 19,758	$ 72,707	$ 220,566
Business and government	**221,506**	**10,740**	**255,761**	**488,007**	175,931	6,854	272,793	455,578
Bank	**8,533**	**49**	**10,450**	**19,032**	7,711	23	13,349	21,083
	$ 358,245	**$ 56,885**	**$ 342,459**	**$ 757,589**	$ 311,743	$ 26,635	$ 358,849	$ 697,227
Non-interest-bearing (4)								
Canada	**$ 78,692**	**$ 4,686**	**$ –**	**$ 83,378**	$ 70,286	$ 3,754	$ –	$ 74,040
United States	**34,172**	**93**	**–**	**34,265**	1,158	31	–	1,189
Europe (5)	**1,009**	**–**	**–**	**1,009**	1,172	–	–	1,172
Other International	**5,753**	**4**	**–**	**5,757**	6,706	6	–	6,712
Interest-bearing (4)								
Canada	**200,911**	**14,979**	**272,999**	**488,889**	192,736	13,529	269,395	475,660
United States	**999**	**32,388**	**41,427**	**74,814**	4,177	4,966	67,710	76,853
Europe (5)	**32,864**	**1,108**	**17,966**	**51,938**	31,554	606	12,270	44,430
Other International	**3,845**	**3,627**	**10,067**	**17,539**	3,954	3,743	9,474	17,171
	$ 358,245	**$ 56,885**	**$ 342,459**	**$ 757,589**	$ 311,743	$ 26,635	$ 358,849	$ 697,227

(1) Deposits payable on demand include all deposits for which we do not have the right to require notice of withdrawal. These deposits include both savings and chequing accounts.
(2) Deposits payable after notice include all deposits for which we can legally require notice of withdrawal. These deposits are primarily savings accounts.
(3) Term deposits include deposits payable on a fixed date. These deposits include term deposits, guaranteed investment certificates and similar instruments.
(4) The geographical splits of the deposits are based on the point of origin of the deposits and where the revenue is recognized. As at October 31, 2016, deposits denominated in U.S. dollars, British pounds, Euro and other foreign currencies were $264 billion, $16 billion, $37 billion and $29 billion, respectively (October 31, 2015 – $235 billion, $13 billion, $32 billion and $28 billion).
(5) Europe includes the United Kingdom, Luxembourg and the Channel Islands.

The following table presents the contractual maturities of our term deposit liabilities.

(Millions of Canadian dollars)	As at October 31 2016	October 31 2015
Within 1 year:		
less than 3 months	**$ 72,346**	$ 78,735
3 to 6 months	**40,487**	49,900
6 to 12 months	**51,608**	61,096
1 to 2 years	**50,676**	43,674
2 to 3 years	**39,499**	39,809
3 to 4 years	**31,482**	26,792
4 to 5 years	**29,854**	30,184
Over 5 years	**26,507**	28,659
	$ 342,459	$ 358,849
Aggregate amount of term deposits in denominations of one hundred thousand dollars or more	**$ 309,000**	$ 331,000

The following table presents the average deposit balances and average rates of interest.

(Millions of Canadian dollars, except for percentage amounts)	For the year ended October 31, 2016 Average balances	October 31, 2016 Average rates	October 31, 2015 Average balances	October 31, 2015 Average rates	October 31, 2014 Average balances	October 31, 2014 Average rates
Canada	**$ 561,711**	**0.84%**	$ 526,544	0.98%	$ 477,316	1.13%
United States	**113,125**	**0.37**	70,100	0.31	52,058	0.30
Europe	**50,341**	**0.15**	48,173	0.28	43,429	0.21
Other International	**24,454**	**1.07**	22,630	0.95	20,299	1.03
	$ 749,631	**0.73%**	$ 667,447	0.86%	$ 593,102	0.99%

Note 15 Insurance

Risk management

Insurance risk is the risk of fluctuations in the timing, frequency or severity of insured events, relative to our expectations at the time of underwriting. We do not have a high degree of concentration risk due to our geographic diversity and business mix. Concentration risk is not a major concern for the life and health insurance business as it does not have a material level of regional specific characteristics like those exhibited in the property and casualty insurance business. Exposure to concentrations of insurance risks for the property and casualty business, up to the sale of certain home and auto insurance manufacturing businesses to Aviva Canada Inc. on July 1, 2016, was primarily mitigated through prudent underwriting practices and diversification by product offerings and geographical areas. Reinsurance is also used for all insurance businesses to lower our risk profile and limit the liability on a single claim. We manage underwriting and pricing risk through the use of underwriting guidelines which detail the class, nature and type of business that may be accepted, pricing policies by product line and centralized control of policy wordings. The risk that claims are handled or paid inappropriately is mitigated by using a range of IT system controls and manual processes conducted by experienced staff. These, together with a range of detailed policies and procedures, ensure that all claims are handled in a timely, appropriate and accurate manner.

Reinsurance

In the ordinary course of business, our insurance operations reinsure risks to other insurance and reinsurance companies in order to lower our risk profile, limit loss exposure to large risks, and provide additional capacity for future growth. These ceding reinsurance arrangements do not relieve our insurance subsidiaries from their direct obligations to the insureds. We evaluate the financial condition of the reinsurers and monitor our concentrations of credit risks to minimize our exposure to losses from reinsurer insolvency. Reinsurance amounts (ceded premiums) included in Non-interest income are shown in the table below.

Net premiums and claims

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Gross premiums	**$ 4,335**	$ 4,721	$ 4,962
Premiums ceded to reinsurers	**(1,160)**	(1,214)	(1,220)
Net premiums	**$ 3,175**	$ 3,507	$ 3,742
Gross claims and benefits	**$ 3,754**	$ 3,237	$ 3,692
Reinsurers' share of claims and benefits	**(546)**	(496)	(498)
Net claims	**$ 3,208**	$ 2,741	$ 3,194

Insurance claims and policy benefit liabilities

All actuarial assumptions are set in conjunction with Canadian Institute of Actuaries Standards of Practice and OSFI requirements. The assumptions that have the greatest effect on the measurement of insurance liabilities, the processes used to determine them and the assumptions used as at October 31, 2016 are as follows:

Life insurance

Mortality and morbidity – Mortality estimates are based on standard industry insured mortality tables, adjusted where appropriate to reflect our own experience. Morbidity assumptions are made with respect to the rates of claim incidence and claim termination for health insurance policies and are based on a combination of industry and our own experience.

Future investment yield – Assumptions are based on the current yield rate, a reinvestment assumption and an allowance for future credit losses for each line of business, and are developed using interest rate scenario testing, including prescribed scenarios for determination of minimum liabilities as set out in the actuarial standards.

Policyholder behaviour – Under certain policies, the policyholder has a contractual right to change benefits and premiums, as well as convert policies to permanent forms of insurance. All policyholders have the right to terminate their policies through lapse. Lapses represent the termination of policies due to non-payment of premiums. Lapse assumptions are primarily based on our recent experience adjusted for emerging industry experience where applicable.

Non-life insurance

Assumptions related to unpaid claims concern the patterns of development of claims from inception to ultimate settlement. The reserving assumptions, based on historical paid/incurred development patterns adjusted for changes in products, claims processes and legislative trends, result in a collective loss ratio when compared with earned premium.

Significant insurance assumptions

	As at	
	October 31 2016	October 31 2015
Life Insurance		
Canadian Insurance		
Mortality rates (1)	**0.13%**	0.12%
Morbidity rates (2)	**1.68**	1.69
Reinvestment yield (3)	**4.00**	3.45
Lapse rates (4)	**0.50**	0.50
International Insurance		
Mortality rates (1)	**0.43**	0.46
Reinvestment yield (3)	**2.75**	2.75
Non-life Insurance		
Expected loss ratio (5) (6)	**n.a.**	60.47

(1) Average annual death rate for the largest portfolio of insured policies.
(2) Average net settlement rate for the individual and group disability insurance portfolio.
(3) Ultimate reinvestment rate of the insurance operations.
(4) Ultimate policy termination rate (lapse rate) for the largest permanent life insurance portfolio that relies on higher termination rate to maintain its profitability (lapse-supported policies).
(5) Ratio of incurred claim losses and claim expenses to net premiums of the property and casualty business, measuring the profitability or loss experience on our total book of business.
(6) Due to the sale of RBC General Insurance Company to Aviva Canada Inc. in 2016, which includes certain home and auto insurance manufacturing businesses, the expected loss ratio included above is no longer applicable. Refer to Note 11.
n.a. not applicable

Insurance claims and policy benefit liabilities
The following table summarizes our gross and reinsurers' share of insurance liabilities at the end of the year.

	As at					
	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	**Gross**	**Ceded**	**Net**	Gross	Ceded	Net
Life insurance policyholder liabilities						
Life, health and annuity	**$ 9,137**	**$ 545**	**$ 8,592**	$ 8,084	$ 519	$ 7,565
Investment contracts (1)	**22**	**–**	**22**	10	–	10
	$ 9,159	**$ 545**	**$ 8,614**	$ 8,094	$ 519	$ 7,575
Non-life insurance policyholder liabilities						
Unearned premium provision (1)	**$ 23**	**$ –**	**$ 23**	$ 450	$ –	$ 450
Unpaid claims provision	**27**	**4**	**23**	1,026	38	988
	$ 50	**$ 4**	**$ 46**	$ 1,476	$ 38	$ 1,438
	$ 9,209	**$ 549**	**$ 8,660**	$ 9,570	$ 557	$ 9,013

(1) Insurance liabilities for investment contracts and unearned premium provision are reported in Other liabilities on the Consolidated Balance Sheets.

Reconciliation of life insurance policyholder liabilities

	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	**Gross**	**Ceded**	**Net**	Gross	Ceded	Net
Balances, beginning of the year	**$ 8,094**	**$ 519**	**$ 7,575**	$ 7,560	$ 390	$ 7,170
New and in-force policies	**1,132**	**26**	**1,106**	598	129	469
Changes in assumption and methodology	**(78)**	**–**	**(78)**	(69)	–	(69)
Net change in investment contracts	**11**	**–**	**11**	5	–	5
Balances, end of the year	**$ 9,159**	**$ 545**	**$ 8,614**	$ 8,094	$ 519	$ 7,575

Reconciliation of non-life insurance policyholder liabilities

	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	**Gross**	**Ceded**	**Net**	Gross	Ceded	Net
Balances, beginning of the year	**$ 1,476**	**$ 38**	**$ 1,438**	$ 1,429	$ 29	$ 1,400
Changes in unearned premiums provision						
Written premiums	**665**	**19**	**646**	937	39	898
Less: Net premiums earned	**(665)**	**(21)**	**(644)**	(906)	(39)	(867)
Less: Disposal (1)	**(429)**	**–**	**(429)**	–	–	–
Changes in unpaid claims provision and adjustment expenses						
Incurred claims	**482**	**18**	**464**	614	27	587
Less: Claims paid	**(439)**	**(4)**	**(435)**	(598)	(18)	(580)
Less: Disposal (1)	**(1,040)**	**(46)**	**(994)**	–	–	–
Balances, end of the year	**$ 50**	**$ 4**	**$ 46**	$ 1,476	$ 38	$ 1,438

(1) RBC General Insurance Company was sold to Aviva Canada Inc. in 2016, which includes certain home and auto insurance manufacturing businesses. Refer to Note 11.

The net decrease in Insurance claims and policy benefit liabilities over the prior year was comprised of the decrease in liabilities resulting from the impact of the sale of certain home and auto insurance manufacturing businesses (refer to Note 11), partially offset by the net increase in life and health, reinsurance and property and casualty liabilities attributable to business growth and market movements on assets backing life and health liabilities. During the year, we reviewed all key actuarial methods and assumptions which are used in determining the policy benefit liabilities resulting in a $78 million net decrease to insurance liabilities comprised of: (i) a decrease of $72 million for assumption updates due to net favourable interest rate and equity market changes; (ii) a decrease of $13 million due to valuation system and data changes; and (iii) an increase of $7 million arising from insurance risk related assumption updates largely due to mortality, morbidity, maintenance, property and casualty margin for adverse deviation and expense assumptions. Changes in Insurance claims and policy benefit liabilities are included in Insurance policyholder benefits, claims and acquisition expenses in our Consolidated Statements of Income in the period in which the estimates changed.

Sensitivity analysis

The following table presents the sensitivity of the level of insurance policyholder liabilities disclosed in this note to reasonably possible changes in the actuarial assumptions used to calculate them. The percentage change in variable is applied to a range of existing actuarial modelling assumptions to derive the possible impact on net income. The disclosure is not intended to explain the impact of a percentage change in the insurance assets and liabilities disclosed above. The analyses are performed where a single assumption is changed while holding other assumptions constant, which is unlikely to occur in practice.

		Net income impact for year ended	
(Millions of Canadian dollars, except for percentage amounts)	Change in variable	**October 31 2016**	October 31 2015
Increase in market interest rates (1)	1%	**$ (2)**	$ –
Decrease in market interest rates (1)	1	**7**	14
Increase in equity market values	10	**4**	3
Decrease in equity market values	10	**(4)**	(2)
Increase in maintenance expenses	5	**(30)**	(28)
Life Insurance			
Adverse change in annuitant mortality rates	2	**(129)**	(117)
Adverse change in assurance mortality rates	2	**(46)**	(48)
Adverse change in morbidity rates	5	**(183)**	(156)
Adverse change in lapse rates	10	**(229)**	(206)
Non-life Insurance			
Increase in expected loss ratio (2)	5	**n.a.**	(9)

(1) Sensitivities for market interest rates have been calculated by increasing or decreasing 100 basis points at all points on the yield curve, with changes persisting for one year.
(2) Due to the sale of RBC General Insurance Company to Aviva Canada Inc. in 2016, which includes certain home and auto insurance manufacturing businesses, the expected loss ratio included above is no longer applicable. Refer to Note 11.
n.a. not applicable

Note 16 Segregated funds

We offer certain individual variable insurance contracts that allow policyholders to invest in segregated funds. The investment returns on these funds are passed directly to the policyholders. Amounts invested are at the policyholders' risk, except where the policyholders have selected options providing maturity and death benefit guarantees. A liability for the guarantees is recorded in Insurance claims and policy benefit liabilities.

Segregated funds net assets are recorded at fair value. All of our segregated funds net assets are categorized as Level 1 in the fair value hierarchy. The fair value of the segregated funds liabilities is equal to the fair value of the segregated funds net assets. Segregated funds net assets and segregated funds liabilities are presented on separate lines on the Consolidated Balance Sheets. The following tables present the composition of net assets and the changes in net assets for the year.

Segregated funds net assets

	As at	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
Cash	**$ 1**	$ –
Investment in mutual funds	**981**	832
Other liabilities, net	**(1)**	(2)
	$ 981	$ 830

Changes in net assets

	For the year ended	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
Net assets, beginning of year	**$ 830**	$ 675
Additions (deductions):		
Deposits from policyholders	**330**	321
Net realized and unrealized gains	**41**	2
Interest and dividend	**25**	26
Payment to policyholders	**(221)**	(173)
Management and administrative fees	**(24)**	(21)
Net assets, end of year	**$ 981**	$ 830

Note 17 Employee benefits – Pension and other post-employment benefits

Plan characteristics

We sponsor a number of programs that provide pension and post-employment benefits to eligible employees. The majority of beneficiaries of the pension plans are located in Canada and other beneficiaries of the pension plans are primarily located in the U.S., the U.K. and the Caribbean. The pension arrangements including investment, plan benefits and funding decisions are governed by local pension committees or trustees, who are legally segregated from the Bank, or management. Significant plan changes require the approval of the Board of Directors.

Our defined benefit pension plans provide pension benefits based on years of service, contributions and average earnings at retirement. Our principal defined benefit pension plans are closed to new members. New employees are generally eligible to join defined contribution pension plans. The specific features of these plans vary by location. We also provide supplemental non-registered (non-qualified) pension plans for certain executives and senior management that are typically unfunded or partially funded.

Our defined contribution pension plans provide pension benefits based on accumulated employee and Bank contributions. The Bank contributions are based on a percentage of an employee's annual earnings and a portion of the Bank contribution may be dependent on the amount being contributed by the employee and their years of service.

Our primary other post-employment benefit plans provide health, dental, disability and life insurance coverage and cover a number of current and retired employees who are mainly located in Canada. These plans are unfunded unless required by legislation.

We measure our benefit obligations and pension assets as at October 31 each year. All plans are valued using the projected unit-credit method. We fund our registered defined benefit pension plans in accordance with actuarially determined amounts required to satisfy employee benefit obligations under current pension regulations. For our primary pension plan, the most recent funding actuarial valuation was completed on January 1, 2016, and the next valuation will be completed on January 1, 2017.

For the year ended October 31, 2016, total contributions to our pension plans (defined benefit and defined contribution plans) and other post-employment benefit plans were $409 million and $49 million (October 31, 2015 – $391 million and $56 million), respectively. For 2017, total contributions to our pension plans and other post-employment benefit plans are expected to be $643 million and $77 million, respectively.

Risks

By their design, the defined benefit pension and other post-employment plans expose the Bank to various risks such as investment performance, reductions in discount rates used to value the obligations, increased longevity of plan members, future inflation levels impacting future salary increases as well as future increases in healthcare costs. By closing membership in our principal defined benefit pension and other post-employment plans and migrating to defined contribution plans, the volatility associated with the aforementioned risks will reduce over time.

The following table presents the financial position related to all of our material pension and other post-employment benefit plans worldwide, including executive retirement arrangements.

	As at			
	October 31, 2016		October 31, 2015	
(Millions of Canadian dollars)	**Defined benefit pension plans**	**Other post-employment benefit plans**	Defined benefit pension plans	Other post-employment benefit plans
Canada				
Fair value of plan assets	**$ 11,416**	**$ 1**	$ 10,847	$ 11
Present value of defined benefit obligation	**12,680**	**1,760**	10,840	1,569
Net (deficit) surplus	**$ (1,264)**	**$ (1,759)**	$ 7	$ (1,558)
International				
Fair value of plan assets	**$ 1,043**	**$ –**	$ 1,049	$ –
Present value of defined benefit obligation	**1,199**	**134**	1,134	88
Net (deficit)	**$ (156)**	**$ (134)**	$ (85)	$ (88)
Total				
Fair value of plan assets	**$ 12,459**	**$ 1**	$ 11,896	$ 11
Present value of defined benefit obligation	**13,879**	**1,894**	11,974	1,657
Total net (deficit)	**$ (1,420)**	**$ (1,893)**	$ (78)	$ (1,646)
Effect of asset ceiling	**(3)**	**–**	–	–
Total net (deficit), net of effect of asset ceiling	**$ (1,423)**	**$ (1,893)**	$ (78)	$ (1,646)
Amounts recognized in our Consolidated Balance Sheets				
Employee benefit assets	**$ 29**	**$ –**	$ 245	$ –
Employee benefit liabilities	**(1,452)**	**(1,893)**	(323)	(1,646)
Total net (deficit), net of effect of asset ceiling	**$ (1,423)**	**$ (1,893)**	$ (78)	$ (1,646)

The following table presents an analysis of the movement in the financial position related to all of our material pension and other post-employment benefit plans worldwide, including executive retirement arrangements.

(Millions of Canadian dollars)	As at or for the year ended October 31, 2016 Defined benefit pension plans (1)	October 31, 2016 Other post-employment benefit plans	October 31, 2015 Defined benefit pension plans (1)	October 31, 2015 Other post-employment benefit plans
Change in fair value of plan assets				
Opening fair value of plan assets	**$ 11,896**	**$ 11**	$ 11,351	$ 4
Interest income	**498**	**–**	460	–
Remeasurements – Return on plan assets (excluding interest income)	**447**	**2**	243	11
Change in foreign currency exchange rate	**(138)**	**–**	113	–
Contributions – Employer	**257**	**49**	235	56
Contributions – Plan participant	**52**	**18**	51	16
Payments	**(536)**	**(79)**	(513)	(76)
Payments – amount paid in respect of any settlements	**(4)**	**–**	(31)	–
Other	**(13)**	**–**	(13)	–
Closing fair value of plan assets	**$ 12,459**	**$ 1**	$ 11,896	$ 11
Change in present value of benefit obligation				
Opening benefit obligation	**$ 11,974**	**$ 1,657**	$ 11,805	$ 1,832
Current service costs	**313**	**36**	345	34
Past service costs	**(5)**	**(3)**	(16)	–
Interest expense	**496**	**71**	490	75
Remeasurements				
Actuarial losses (gains) from demographic assumptions	**(5)**	**(17)**	7	(176)
Actuarial losses (gains) from financial assumptions	**1,644**	**194**	(296)	(33)
Actuarial losses (gains) from experience adjustments	**79**	**17**	(7)	(27)
Change in foreign currency exchange rate	**(128)**	**–**	139	15
Contributions – Plan participant	**52**	**18**	51	16
Payments	**(536)**	**(79)**	(513)	(76)
Payments – amount paid in respect of any settlements	**(4)**	**–**	(31)	–
Business combinations/Disposals	**–**	**–**	–	(3)
Other	**(1)**	**–**	–	–
Closing benefit obligation	**$ 13,879**	**$ 1,894**	$ 11,974	$ 1,657
Unfunded obligation	**$ 33**	**$ 1,732**	$ 33	$ 332
Wholly or partly funded obligation	**13,846**	**162**	11,941	1,325
Total benefit obligation	**$ 13,879**	**$ 1,894**	$ 11,974	$ 1,657

(1) For pension plans with funding deficits, the benefit obligations and fair value of plan assets as at October 31, 2016 were $12,705 million and $11,267 million, respectively (October 31, 2015 – $1,020 million and $709 million, respectively).

Pension and other post-employment benefit expense

The following table presents the composition of our pension and other post-employment benefit expense related to our material benefit plans worldwide.

(Millions of Canadian dollars)	For the year ended Pension plans October 31 2016	Pension plans October 31 2015	Pension plans October 31 2014	Other post-employment benefit plans October 31 2016	Other post-employment benefit plans October 31 2015	Other post-employment benefit plans October 31 2014
Current service costs	**$ 313**	$ 345	$ 315	**$ 36**	$ 34	$ 31
Past service costs	**(5)**	(16)	97	**(3)**	–	–
Net interest expense (income)	**(2)**	30	14	**71**	75	80
Remeasurements of other long term benefits	**–**	–	–	**16**	2	9
Administrative expense	**13**	12	13	**–**	–	–
Defined benefit pension expense	**$ 319**	$ 371	$ 439	**$ 120**	$ 111	$ 120
Defined contribution pension expense	**152**	156	137	**–**	–	–
	$ 471	$ 527	$ 576	**$ 120**	$ 111	$ 120

Service costs for the year ended October 31, 2016 totalled $300 million (October 31, 2015 – $335 million; October 31, 2014 – $307 million) for pension plans in Canada and $8 million (October 31, 2015 – $(6) million; October 31, 2014 – $105 million) for International plans. Net interest expense (income) for the year ended October 31, 2016 totalled $(6) million (October 31, 2015 – $25 million; October 31, 2014 – $10 million) for pension plans in Canada and $4 million (October 31, 2015 – $5 million; October 31, 2014 – $4 million) for International plans.

Remeasurements of employee benefit plans
The following table presents the composition of our remeasurements recorded in OCI related to our material benefit plans worldwide.

	For the year ended					
	Defined benefit pension plans			Other post-employment benefit plans		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014	**October 31 2016**	October 31 2015	October 31 2014
Actuarial (gains) losses:						
Changes in demographic assumptions	**$ (5)**	$ 7	$ 76	**$ (20)**	$ (174)	$ (54)
Changes in financial assumptions	**1,644**	(296)	830	**186**	(30)	113
Experience adjustments	**79**	(7)	6	**12**	(34)	–
Return on plan assets (excluding interest based on discount rate)	**(447)**	(243)	(647)	**(2)**	(11)	–
Change in asset ceiling (excluding interest income)	**3**	–	–	**–**	–	–
	$ 1,274	$ (539)	$ 265	**$ 176**	$ (249)	$ 59

Remeasurements recorded in OCI for the year ended October 31, 2016 were losses of $1,180 million (October 31, 2015 – gains of $526 million; October 31, 2014 – losses of $238 million) for pension plans in Canada and losses of $94 million (October 31, 2015 – gains of $13 million; October 31, 2014 – losses of $27 million) for International plans.

Investment policy and strategies
Defined benefit pension plan assets are invested prudently in order to meet our longer-term pension obligations. The pension plan's investment strategy is to hold a diversified mix of investments by asset class and geographic location in order to reduce investment-specific risk to the funded status while maximizing the expected returns to meet pension obligations. Investment of the plan's assets is conducted with careful consideration of the pension obligation's valuation sensitivity to interest rates and credit spreads which are key risk factors impacting the obligation. The asset mix policy is therefore consistent with an asset/liability framework. Factors taken into consideration in developing our asset mix include but are not limited to the following:

(i) the nature of the underlying benefit obligations, including the duration and term profile of the liabilities;
(ii) the member demographics, including expectations for normal retirements, terminations, and deaths;
(iii) the financial position of the pension plans;
(iv) the diversification benefits obtained by the inclusion of multiple asset classes; and
(v) expected asset returns, including asset and liability volatility and correlations.

To implement our asset mix policy, we may invest in equity securities, debt securities, alternative investments and derivative instruments. Our holdings in certain investments, including common shares, emerging market equity and debt, debt securities rated lower than BBB and residential and commercial mortgages, cannot exceed a defined percentage of the market value of our defined benefit pension plan assets. We may use derivative instruments as either a synthetic investment to more efficiently replicate the performance of an underlying security, or as a hedge against financial risks within the plan. To manage our credit risk exposure, counterparties of our derivative instruments are required to meet minimum credit ratings and enter into collateral agreements.

Our defined benefit pension plan assets are primarily comprised of equity and debt securities. Our equity securities generally have unadjusted quoted market prices in an active market (Level 1) and our debt securities generally have quoted market prices for similar assets in an active market (Level 2). Alternative investments and other includes cash, hedge funds, and private fund investments including infrastructure, real estate leases, private equity and derivative financial instruments. In the case of private fund investments, no quoted market prices are usually available (Level 2 or Level 3). These fund assets are either valued by an independent valuator or priced using observable market inputs.

During the year ended October 31, 2016, investment changes and risk factor diversification continued in support of our efforts to reduce variability in the funded status primarily through improved credit and duration matching between the plan's assets and liabilities. An increasing allocation to debt securities is used to reduce asset liability duration mismatch and hence variability of the plan's funded status due to interest rate changes. Longer maturity debt securities, given their price sensitivity to movements in interest rates, are considered to be a good economic hedge to risk associated with the plan's liabilities, which are discounted using predominately long maturity bond interest rates as inputs. We expect to continue to move towards a higher weighting of debt securities as market conditions permit, to further reduce risk of variability in the funded status.

Asset allocation of defined benefit pension plans (1)

(Millions of Canadian dollars, except percentages)	As at October 31, 2016 Fair value	Percentage of total plan assets	Quoted in active market (2)	As at October 31, 2015 Fair value	Percentage of total plan assets	Quoted in active market (2)
Equity securities						
Domestic	**$ 1,487**	**12%**	**100%**	$ 1,277	11%	100%
Foreign	**2,971**	**24**	**89**	2,645	22	98
Debt securities						
Domestic government bonds	**2,536**	**20**	**–**	2,232	19	–
Foreign government bonds	**533**	**4**	**–**	561	5	–
Corporate and other bonds	**2,648**	**21**	**–**	2,548	21	–
Alternative investments and other	**2,284**	**19**	**24**	2,633	22	8
	$ 12,459	**100%**	**38%**	$ 11,896	100%	34%

(1) The asset allocation is based on the underlying investments held directly and indirectly through the funds as this is how we manage our investment policy and strategies.
(2) If our assessment of whether or not an asset was quoted in an active market was based on direct investments, 42% of our total plan assets would be classified as quoted in an active market (October 31, 2015 – 36%).

The allocation to equity securities of our pension plans in Canada is 37% (October 31, 2015 – 34%) and that of our International plans is 17% (October 31, 2015 – 17%). The allocation to debt securities of our pension plans in Canada is 45% (October 31, 2015 – 44%) and that of our International plans is 60% (October 31, 2015 – 57%). The allocation to alternative investments and other in our pension plans in Canada is 18% (October 31, 2015 – 22%) and that of our International plans is 23% (October 31, 2015 – 26%).

As at October 31, 2016, the plan assets include 1 million (October 31, 2015 – 1 million) of our common shares with a fair value of $99 million (October 31, 2015 – $85 million) and $62 million (October 31, 2015 – $71 million) of our debt securities. For the year ended October 31, 2016, dividends received on our common shares held in the plan assets were $4 million (October 31, 2015 – $4 million).

Maturity profile
The following table presents the maturity profile of our defined benefit pension plan obligation.

(Millions of Canadian dollars, except participants and years)	As at October 31, 2016 Canada	International	Total
Number of plan participants	**72,748**	**8,595**	**81,343**
Actual benefit payments 2016	**$ 481**	**$ 59**	**$ 540**
Benefits expected to be paid 2017	**551**	**51**	**602**
Benefits expected to be paid 2018	**576**	**51**	**627**
Benefits expected to be paid 2019	**598**	**52**	**650**
Benefits expected to be paid 2020	**619**	**58**	**677**
Benefits expected to be paid 2021	**639**	**59**	**698**
Benefits expected to be paid 2022-2026	**3,454**	**331**	**3,785**
Weighted average duration of defined benefit payments	**15.7 years**	**19.1 years**	**16.0 years**

Significant assumptions
Our methodologies to determine significant assumptions used in calculating the defined benefit pension and other post-employment benefit expense are as follows:

Discount rate
For the Canadian pension and other post-employment benefit plans, all future expected benefit payments at each measurement date are discounted at spot rates from a derived AA corporate bond yield curve. The derived curve is based on actual short and mid-maturity corporate AA rates and extrapolated longer term rates. The extrapolated corporate AA rates are derived from observed corporate A, corporate AA and provincial AA yields. For the International pension and other post-employment benefit plans, all future expected benefit payments at each measurement date are discounted at spot rates from an AA corporate bond yield curve. Spot rates beyond 30 years are set to equal the 30-year spot rate. The discount rate is the equivalent single rate that produces the same discounted value as that determined using the entire discount curve. This valuation methodology does not rely on assumptions regarding reinvestment returns.

Rate of increase in future compensation
The assumptions for increases in future compensation are developed separately for each plan, where relevant. Each assumption is set based on the price inflation assumption and compensation policies in each market, as well as relevant local statutory and plan-specific requirements.

Healthcare cost trend rates
Healthcare cost calculations are based on both short and long term trend assumptions established based on the plan's recent experience as well as market expectations.

Weighted average assumptions to determine benefit obligation

	As at					
	Defined benefit pension plans			Other post-employment benefit plans		
	October 31 2016	October 31 2015	October 31 2014	**October 31 2016**	October 31 2015	October 31 2014
Discount rate	**3.50%**	4.30%	4.10%	**3.60%**	4.40%	4.20%
Rate of increase in future compensation	**3.30%**	3.30%	3.30%	**n.a.**	n.a.	n.a.
Healthcare cost trend rates (1)						
– Medical	**n.a.**	n.a.	n.a.	**4.10%**	4.10%	3.50%
– Dental	**n.a.**	n.a.	n.a.	**4.00%**	4.00%	4.00%

(1) For our other post-employment benefit plans, the 2016 assumed trend rates used to measure the expected benefit costs of the defined benefit obligations are also the ultimate trend rates.
n.a. not applicable

Mortality assumptions
Mortality assumptions are significant in measuring our obligations under the defined benefit pension plans. These assumptions have been set based on country specific statistics. Future longevity improvements have been considered and included where appropriate. The following table summarizes the mortality assumptions used for major plans.

	As at							
	October 31, 2016				October 31, 2015			
	Life expectancy at 65 for a member currently at				Life expectancy at 65 for a member currently at			
	Age 65		**Age 45**		Age 65		Age 45	
(In years)	**Male**	**Female**	**Male**	**Female**	Male	Female	Male	Female
Country								
Canada	**23.1**	**23.6**	**24.1**	**24.6**	23.1	23.6	24.1	24.5
United States	**20.8**	**22.8**	**20.5**	**22.9**	21.2	23.2	21.7	24.1
United Kingdom	**24.0**	**26.0**	**26.1**	**28.3**	24.0	25.9	26.0	28.2

Sensitivity analysis
Assumptions adopted can have a significant effect on the obligations for defined benefit pension and other post-employment benefit plans. The increase (decrease) in obligation in the following table has been determined assuming all other assumptions are held constant. In practice, this is unlikely to occur, as changes in some of the assumptions may be correlated. The following table presents the sensitivity analysis of key assumptions for 2016.

(Millions of Canadian dollars)	**Defined benefit pension plans – Increase (decrease) in obligation**	**Other post-employment benefit plans – Increase (decrease) in obligation**
Discount rate		
Impact of 50bps increase in discount rate	**$ (1,048)**	**$ (137)**
Impact of 50bps decrease in discount rate	**1,176**	**152**
Rate of increase in future compensation		
Impact of 50bps increase in rate of increase in future compensation	**68**	**1**
Impact of 50bps decrease in rate of increase in future compensation	**(69)**	**(1)**
Mortality rate		
Impact of an increase in longevity by one additional year	**333**	**37**
Healthcare cost trend rate		
Impact of 100bps increase in healthcare cost trend rate	**n.a.**	**113**
Impact of 100bps decrease in healthcare cost trend rate	**n.a.**	**(92)**

n.a. not applicable

Note 18 Other liabilities

(Millions of Canadian dollars)	As at October 31 2016	As at October 31 2015
Cash collateral	**$ 14,545**	$ 15,249
Accounts payable and accrued expenses	**1,191**	999
Payroll and related compensation	**6,448**	6,358
Payable to brokers, dealers and clients	**2,919**	2,981
Negotiable instruments	**2,277**	2,309
Accrued interest payable	**1,630**	1,679
Deferred income	**1,971**	2,028
Taxes payable	**2,730**	1,533
Precious metals certificates	**485**	420
Dividends payable	**1,309**	1,194
Insurance related liabilities	**328**	735
Deferred income taxes	**989**	201
Provisions	**485**	512
Employee benefit liabilities	**3,345**	1,969
Other	**7,295**	5,309
	$ 47,947	$ 43,476

Note 19 Subordinated debentures

The debentures are unsecured obligations and are subordinated in right of payment to the claims of depositors and certain other creditors. The amounts presented below are net of our own holdings in these debentures, and include the impact of fair value hedges used for managing interest rate risk.

(Millions of Canadian dollars, except percentage and foreign currency) Maturity	Earliest par value redemption date	Interest rate	Denominated in foreign currency (millions)	As at October 31 2016	As at October 31 2015
November 14, 2014 (1)		10.00%		**$ –**	$ –
August 12, 2019		9.00%	US$75	**115**	–
June 15, 2020	June 15, 2015 (2)	4.35% (3)		**–**	–
November 2, 2020	November 2, 2015 (4)	3.18% (5)		**–**	1,500
July 15, 2022		5.38%	US$150	**218**	–
June 8, 2023		9.30%		**110**	110
July 17, 2024 (6)	July 17, 2019	3.04% (7)		**1,014**	1,014
December 6, 2024	December 6, 2019	2.99% (8)		**2,055**	2,061
June 4, 2025 (6)	June 4, 2020	2.48% (9)		**1,003**	1,004
January 20, 2026 (6)	January 20, 2021	3.31% (10)		**1,496**	–
January 27, 2026 (6)		4.65%	US$1,500	**2,057**	–
September 29, 2026 (6)	September 29, 2021	3.45% (11)		**1,061**	1,055
November 1, 2027	November 1, 2022	4.75%	TT$300	**60**	62
June 26, 2037	June 26, 2017	2.86%	JPY 10,000	**131**	112
October 1, 2083	Any interest payment date	(12)		**224**	224
June 29, 2085	Any interest payment date	(13)	US$174	**233**	227
				$ 9,777	$ 7,369
Deferred financing costs				**(15)**	(7)
				$ 9,762	$ 7,362

The terms and conditions of the debentures are as follows:

(1) All $200 million outstanding 10.00% subordinated debentures matured on November 14, 2014.

(2) All $1.5 billion outstanding subordinated debentures were redeemed on June 15, 2015 for 100% of their principal amount plus accrued interest to the redemption date.

(3) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.41% above the 90-day Bankers' Acceptance rate.

(4) All $1.5 billion outstanding subordinated debentures were redeemed on November 2, 2015 for 100% of their principal amount plus accrued interest to the redemption date.

(5) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.21% above the 90-day Bankers' Acceptance rate.

(6) The notes include non-viability contingency capital (NVCC) provisions, necessary for the notes to qualify as Tier 2 regulatory capital under Basel III. NVCC provisions require the conversion of the instrument into a variable number of common shares in the event that OSFI deems the Bank non-viable or a federal or provincial government in Canada publicly announces that the Bank has accepted or agreed to accept a capital injection. In such an event, each note is convertible into common shares pursuant to an automatic conversion formula with a multiplier of 1.5 and a conversion price based on the greater of: (i) a floor price of $5.00 and (ii) the current market price of our common shares based on the volume weighted average trading price of our common shares on the Toronto Stock Exchange. The number of shares issued is determined by dividing the par value of the note (including accrued and unpaid interest on such note) by the conversion price and then times the multiplier.

(7) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.08% above the 90-day Bankers' Acceptance rate.

(8) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.10% above the 90-day Bankers' Acceptance rate.

(9) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.10% above the 90-day Bankers' Acceptance rate.

(10) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 2.35% above the 90-day Bankers' Acceptance rate.

(11) Interest at stated interest rate until earliest par value redemption date, and thereafter at a rate of 1.12% above the 90-day Bankers' Acceptance rate.

(12) Interest at a rate of 40 basis points above the 30-day Bankers' Acceptance rate.

(13) Interest at a rate of 25 basis points above the U.S. dollar 3-month London Interbank Mean Rate (LIMEAN). In the event of a reduction of the annual dividend we declare on our common shares, the interest payable on the debentures is reduced pro rata to the dividend reduction and the interest reduction is payable with the proceeds from the sale of newly issued common shares.

Note 19 Subordinated debentures (continued)

All redemptions, cancellations and exchanges of subordinated debentures are subject to the consent and approval of OSFI, except for the debentures maturing on August 12, 2019 and July 15, 2022.

Maturity schedule
The aggregate maturities of subordinated debentures, based on the maturity dates under the terms of issue, are as follows:

(Millions of Canadian dollars)	October 31 2016
1 to 5 years	$ 115
5 to 10 years	9,014
Thereafter	648
	$ 9,777

Note 20 Trust capital securities

We issued innovative capital instruments, RBC Trust Capital Securities (RBC TruCS), through the structured entity RBC Capital Trust (Trust).

The Trust has issued non-voting RBC TruCS Series 2010, 2011, 2015 and 2008-1 (RBC TruCS 2010, 2011, 2015 and 2008-1). RBC TruCS 2010 and 2011 were redeemed in 2010 and 2011, respectively. On December 31, 2015, the Trust redeemed all issued and outstanding RBC TruCS 2015 for cash at a redemption price of $1,000 per unit.

The holders of the remaining outstanding RBC TruCS do not have any conversion rights or any other redemption rights. As a result, upon consolidation of the Trust, RBC TruCS are classified as non-controlling interests. Holders of RBC TruCS 2008-1 are eligible to receive semi-annual non-cumulative fixed cash distributions until June 30, 2018, and floating-rate cash distributions thereafter.

No cash distributions will be payable by the Trust on RBC TruCS if we fail to declare regular dividends (i) on our preferred shares, or (ii) on our common shares if no preferred shares are then outstanding. In this case, the net distributable funds of the Trust will be distributed to us as holders of residual interest in the Trust. Should the Trust fail to pay the semi-annual distributions in full, we will not declare dividends of any kind on any of our preferred or common shares for a specified period of time.

The table below presents the significant terms and conditions of RBC TruCS.

Significant terms and conditions of RBC Trust Capital Securities

					As at	
				Earliest redemption date	October 31 2016	October 31 2015
(Millions of Canadian dollars, except for percentage amounts)	Issuance date	Distribution dates	Annual yield	At the option of the issuer	Principal amount	Principal amount
RBC Capital Trust (1) (2) (3) (4) (5) (6)						
Included in Non-controlling interests						
1,200,000 Trust Capital Securities – Series 2015	October 28, 2005	June 30, December 31	4.87% (7)	December 31, 2010	$ –	$ 1,200
500,000 Trust Capital Securities – Series 2008-1	April 28, 2008	June 30, December 31	6.82% (7)	June 30, 2013	500	500

The significant terms and conditions of the RBC TruCS are as follows:

(1) Subject to the approval of OSFI, the Trust may, on the earliest redemption date specified above, and on any distribution date thereafter, redeem in whole (but not in part) RBC TruCS 2008-1, without the consent of the holders. RBC TruCS 2015 were redeemed on December 31, 3015.

(2) Subject to the approval of OSFI, upon occurrence of a special event as defined in the RBC TruCS 2008-1 prospectus, prior to the earliest redemption date specified above, the Trust may redeem in whole (but not in part) the RBC TruCS 2008-1 without the consent of the holders.

(3) Issuer Redemption Price: RBC TruCS 2008-1 may be redeemed for cash equivalent to (i) the Early Redemption Price, if the redemption occurs prior to June 30, 2018 or (ii) the Redemption Price, if the redemption occurs on or after June 30, 2018. RBC TruCS 2015 were redeemable for cash equivalent to (i) the Early Redemption Price, prior to December 31, 2015, and (ii) the Redemption Price, on or after December 31, 2015. Redemption Price refers to an amount equal to $1,000 plus the unpaid distributions to the redemption date. Early Redemption Price refers to an amount equal to the greater of (i) the Redemption Price and (ii) the price calculated to provide an annual yield, equal to the yield on a Government of Canada bond issued on the redemption date with a maturity date of June 30, 2018, plus 77 basis points, for RBC TruCS 2008-1, and a maturity date of December 31, 2015, plus 19.5 basis points, for RBC TruCS 2015.

(4) Automatic Exchange Event: Without the consent of the holders, each RBC TruCS 2008-1 will be exchanged automatically for 40 of our non-cumulative redeemable First Preferred Shares Series AI, upon occurrence of any of the following events: (i) proceedings are commenced for our winding-up; (ii) OSFI takes control of us; (iii) we have a Tier 1 capital ratio of less than 5% or Total capital ratio of less than 8%; or (iv) OSFI has directed us to increase our capital or provide additional liquidity and we elect such automatic exchange or we fail to comply with such direction. The First Preferred Shares Series AI pay semi-annual non-cumulative cash dividends. Without the consent of the holders, each RBC TruCS 2015 was automatically exchangeable for 40 of our non-cumulative redeemable First Preferred Shares Series Z, upon occurrence of any of the aforementioned exchange events.

(5) From time to time, we purchase some of the innovative capital instruments and hold them temporarily. As at October 31, 2016, we held $nil RBC TruCS 2008-1 (October 31, 2015 – $6 million) as treasury holdings. Treasury holdings are deducted from regulatory capital.

(6) Regulatory capital: In accordance with OSFI Capital Adequacy Requirements, effective January 2013, RBC TruCS no longer qualify as additional Tier 1 capital due to their lack of non-viability contingent capital terms and conditions. As such, outstanding RBC TruCS are being phased out of regulatory capital in accordance with OSFI guidelines.

(7) The non-cumulative cash distribution on the RBC TruCS 2015 was 4.87% paid semi-annually until December 31, 2015. The non-cumulative cash distribution on the RBC TruCS 2008-1 will be 6.82% paid semi-annually until June 30, 2018, and one half of the sum of 180-day Bankers' Acceptance rate plus 3.5% thereafter.

Note 21 Equity

Share capital

Authorized share capital

Preferred – An unlimited number of First Preferred Shares and Second Preferred Shares without nominal or par value, issuable in series; the aggregate consideration for which all the First Preferred Shares and all the Second Preferred Shares that may be issued may not exceed $20 billion and $5 billion, respectively.
Common – An unlimited number of shares without nominal or par value may be issued.

Outstanding share capital

The following table details our common and preferred shares outstanding.

	As at					
	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars, except the number of shares and dividends per share)	**Number of shares (thousands)**	**Amount**	**Dividends declared per share**	Number of shares (thousands)	Amount	Dividends declared per share
Preferred shares						
First preferred (1)						
Non-cumulative, fixed rate						
Series W	**12,000**	**$ 300**	**$ 1.23**	12,000	$ 300	$ 1.23
Series AA	**12,000**	**300**	**1.11**	12,000	300	1.11
Series AB	**12,000**	**300**	**1.18**	12,000	300	1.18
Series AC	**8,000**	**200**	**1.15**	8,000	200	1.15
Series AD	**10,000**	**250**	**1.13**	10,000	250	1.13
Series AE	**10,000**	**250**	**1.13**	10,000	250	1.13
Series AF	**8,000**	**200**	**1.11**	8,000	200	1.11
Series AG	**10,000**	**250**	**1.13**	10,000	250	1.13
Series BH	**6,000**	**150**	**1.23**	6,000	150	0.58
Series BI	**6,000**	**150**	**1.23**	6,000	150	0.42
Series BJ	**6,000**	**150**	**1.51**	6,000	150	–
Series C-1 (2)	**82**	**107**	**US$ 55.00**	–	–	–
Non-cumulative, 5-Year Rate Reset						
Series AJ (3)	**13,579**	**339**	**0.88**	13,579	339	0.88
Series AL	**12,000**	**300**	**1.07**	12,000	300	1.07
Series AX (4)	**–**	**–**	**–**	–	–	–
Series AZ	**20,000**	**500**	**1.00**	20,000	500	1.00
Series BB	**20,000**	**500**	**0.98**	20,000	500	0.98
Series BD	**24,000**	**600**	**0.90**	24,000	600	0.73
Series BF	**12,000**	**300**	**0.90**	12,000	300	0.63
Series BK (5)	**29,000**	**725**	**1.29**	–	–	–
Series BM (6)	**30,000**	**750**	**0.98**	–	–	–
Non-cumulative, floating rate						
Series AK (3)	**2,421**	**61**	**0.60**	2,421	61	0.67
Non-cumulative, fixed rate/floating rate						
Series C-2 (7)	**20**	**31**	**US$ 67.50**	–	–	–
		$ 6,713			$ 5,100	
Common shares						
Balance at beginning of year	**1,443,423**	**$ 14,573**		1,442,233	$ 14,511	
Issued in connection with the acquisition of City National	**41,619**	**3,115**		–	–	
Issued in connection with share-based compensation plans (8)	**4,981**	**307**		1,190	62	
Purchased for cancellation (9)	**(4,629)**	**(56)**		–	–	
Balance at end of year	**1,485,394**	**$ 17,939**	**$ 3.24**	1,443,423	$ 14,573	$ 3.08
Treasury shares – Preferred shares						
Balance at beginning of year	**(63)**	**$ (2)**		1	$ –	
Sales	**7,267**	**172**		4,736	117	
Purchases	**(7,173)**	**(170)**		(4,800)	(119)	
Balance at end of year	**31**	**$ –**		(63)	$ (2)	
Treasury shares – Common shares						
Balance at beginning of year	**532**	**$ 38**		892	$ 71	
Sales	**64,678**	**4,973**		78,852	6,098	
Purchases	**(66,369)**	**(5,091)**		(79,212)	(6,131)	
Balance at end of year	**(1,159)**	**$ (80)**		532	$ 38	

(1) First Preferred Shares were issued at $25 per share with the exception of Non-Cumulative Perpetual First Preferred Shares, Series C-1 (Series C-1) and Non-Cumulative Fixed Rate/Floating Rate First Preferred Shares, Series C-2 (Series C-2) which were issued at US$25 per depositary share.

(2) On November 2, 2015, we issued 175 thousand Series C-1, totalling $227 million, in connection with the acquisition of City National. On February 24, 2016, we purchased for cash 3,717,969 depositary shares, each representing a one-fortieth interest in a share of Series C-1. The purchased depositary and underlying Series C-1 shares were subsequently cancelled.

(3) On February 24, 2014, we issued 2.4 million Non-Cumulative Floating Rate First Preferred Shares, Series AK, totalling $61 million through a holder option, one-for-one conversion of some of our Non-Cumulative 5-year Rate Reset First Preferred Shares, Series AJ.

(4) On November 24, 2014, we redeemed all 13 million of issued and outstanding Non-Cumulative 5-year Rate Reset First Preferred Shares Series AX for cash at a redemption price of $25 per share.

(5) On December 16, 2015, we issued 27 million Non-Cumulative 5-Year Rate Reset First Preferred Shares, Series BK (Series BK) and on December 31, 2015, we issued an additional 2 million Series BK, totalling $725 million.

(6) On March 7, 2016, we issued 30 million Non-Cumulative 5-year Rate Reset First Preferred Shares, Series BM, totalling $750 million.

(7) On November 2, 2015, we issued 100 thousand Series C-2, totalling $153 million, in connection with the acquisition of City National. On February 24, 2016, we purchased for cash 3,184,562 depositary shares, each representing a one-fortieth interest in a share of Series C-2. The purchased depositary and underlying Series C-2 shares were subsequently cancelled.

(8) Includes fair value adjustments to stock options of $60 million (2015 – $7 million).

(9) During the year ended October 31, 2016, we purchased common shares for cancellation at an average cost of $78.10 per share with a book value of $12.03 per share. During the year ended October 31, 2015, we did not purchase any common shares for cancellation.

Significant terms and conditions of preferred shares

As at October 31, 2016	Initial Period Annual Yield	Premium		Current Dividend per share (1)	Earliest redemption date (2)	Issue Date		Redemption price (2), (3)
Preferred shares								
First preferred								
Non-cumulative, fixed rate								
Series W (4)	4.90%		$	.306250	February 24, 2010	January 31, 2005	$	25.00
Series AA	4.45%			.278125	May 24, 2011	April 4, 2006		25.00
Series AB	4.70%			.293750	August 24, 2011	July 20, 2006		25.00
Series AC	4.60%			.287500	November 24, 2011	November 1, 2006		25.00
Series AD	4.50%			.281250	February 24, 2012	December 13, 2006		25.00
Series AE	4.50%			.281250	February 24, 2012	January 19, 2007		25.00
Series AF	4.45%			.278125	May 24, 2012	March 14, 2007		25.00
Series AG	4.50%			.281250	May 24, 2012	April 26, 2007		25.00
Series BH (5)	4.90%			.306250	November 24, 2020	June 5, 2015		26.00
Series BI (5)	4.90%			.306250	November 24, 2020	July 22, 2015		26.00
Series BJ (5)	5.25%			.328125	February 24, 2021	October 2, 2015		26.00
Series C-1 (6)	5.50%		US$	13.750000	November 13, 2017	November 2, 2015	US$	1,000.00
Non-cumulative, 5-Year Rate Reset (7)								
Series AJ	5.00%	1.93%		.220000	February 24, 2014	September 16, 2008		25.00
Series AL	5.60%	2.67%		.266250	February 24, 2014	November 3, 2008		25.00
Series AZ (5)	4.00%	2.21%		.250000	May 24, 2019	January 30, 2014		25.00
Series BB (5)	3.90%	2.26%		.243750	August 24, 2019	June 3, 2014		25.00
Series BD (5)	3.60%	2.74%		.225000	May 24, 2020	January 30, 2015		25.00
Series BF (5)	3.60%	2.62%		.225000	November 24, 2020	March 13, 2015		25.00
Series BK (5)	5.50%	4.53%		.343750	May 24, 2021	December 16, 2015		25.00
Series BM (5)	5.50%	4.80%		.343750	August 24, 2021	March 7, 2016		25.00
Non-cumulative, floating rate								
Series AK (8)		1.93%		.151359	February 24, 2019	February 24, 2014		25.00
Non-cumulative, fixed rate/floating rate								
Series C-2 (9)	6.75%	4.052%	US$	16.875000	November 7, 2023	November 2, 2015	US$	1,000.00

(1) Non-cumulative preferential dividends of each Series are payable quarterly, as and when declared by the Board of Directors, on or about the 24th day (13th and 7th day for Series C-1 and Series C-2, respectively) of February, May, August and November.

(2) Subject to the consent of OSFI and the requirements of the *Bank Act* (Canada), we may, on or after the dates specified above, redeem First Preferred Shares. In the case of Series AJ, AL, AZ, BB, BD, BF, BK, BM and AK, these may be redeemed for cash at a price per share of $25 if redeemed on the earliest redemption date and on the same date every fifth year thereafter. In the case of Series W, AA, AB, AC, AD, AE, AF, AG, BH, BI and BJ, these may be redeemed for cash at a price per share of $26 if redeemed during the 12 months commencing on the earliest redemption date and decreasing by $0.25 each 12-month period thereafter to a price per share of $25 if redeemed four years from the earliest redemption date or thereafter. Series C-1 and Series C-2 may be redeemed at a price of US$1,000 on the earliest redemption date and any dividend payment date thereafter.

(3) Subject to the consent of OSFI and the requirements of the *Bank Act* (Canada), we may purchase the First Preferred Shares of each Series for cancellation at the lowest price or prices at which, in the opinion of the Board of Directors, such shares are obtainable.

(4) Subject to the approval of the Toronto Stock Exchange, we may, on or after February 24, 2010, convert First Preferred Shares Series W into our common shares. First Preferred Shares Series W may be converted into that number of common shares determined by dividing the current redemption price by the greater of $2.50 and 95% of the weighted average trading price of common shares at such time.

(5) The preferred shares include non-viability contingency capital (NVCC) provisions, necessary for the shares to qualify as Tier 1 regulatory capital under Basel III. NVCC provisions require the conversion of the instrument into a variable number of common shares in the event that OSFI deems the Bank non-viable or a federal or provincial government in Canada publicly announces that the Bank has accepted or agreed to accept a capital injection. In such an event, each preferred share is convertible into common shares pursuant to an automatic conversion formula with a conversion price based on the greater of: (i) a floor price of $5.00 and (ii) the current market price of our common shares based on the volume weighted average trading price of our common shares on the Toronto Stock Exchange. The number of shares issued is determined by dividing the preferred share value ($25.00 plus declared and unpaid dividends) by the conversion price.

(6) Series C-1 do not qualify as Tier 1 regulatory capital.

(7) The dividend rate will reset on the earliest redemption date and every fifth year thereafter at a rate equal to the 5-year Government of Canada bond yield plus the premium indicated. The holders have the option to convert their shares into non-cumulative floating rate First Preferred Shares subject to certain conditions on the earliest redemption date and every fifth year thereafter at a rate equal to the three-month Government of Canada Treasury Bill rate plus the premium indicated.

(8) The dividend rate is equal to the three-month Government of Canada Treasury Bill rate plus the premium indicated. The holders have the option to convert their shares into non-cumulative First Preferred Shares, Series AJ subject to certain conditions on February 24, 2019 and every fifth year thereafter.

(9) The dividend rate will change on the earliest redemption date at a rate equal to the 3-month LIBOR plus the premium indicated. Series C-2 do not qualify as Tier 1 regulatory capital.

Restrictions on the payment of dividends

We are prohibited by the Bank Act (Canada) from declaring any dividends on our preferred or common shares when we are, or would be placed as a result of the declaration, in contravention of the capital adequacy and liquidity regulations or any regulatory directives issued under the Act. We may not pay dividends on our common shares at any time unless all dividends to which preferred shareholders are then entitled have been declared and paid or set apart for payment. We have agreed that if the Trust fails to pay any required distribution on the trust capital securities in full, we will not declare dividends of any kind on any of our preferred or common shares. Refer to Note 20.

Currently, these limitations do not restrict the payment of dividends on our preferred or common shares.

Dividend reinvestment plan
Our dividend reinvestment plan (DRIP) provides common and preferred shareholders with a means to receive additional common shares rather than cash dividends. The plan is only open to shareholders residing in Canada or the United States. The requirements of our DRIP are satisfied through either open market share purchases or shares issued from treasury. During 2016 and 2015, the requirements of our DRIP were satisfied through open market share purchases.

Shares available for future issuances
As at October 31, 2016, 45.8 million common shares are available for future issue relating to our DRIP and potential exercise of stock options outstanding. In addition, we may issue up to 38.9 million common shares from treasury under the RBC Umbrella Savings and Securities Purchase Plan that was approved by shareholders on February 26, 2009.

Non-controlling interests

	As at	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
RBC Trust Capital Securities (1)		
Series 2015	**$ –**	$ 1,219
Series 2008-1	**511**	505
Other	**84**	74
	$ 595	$ 1,798

(1) As at October 31, 2016, RBC TruCS Series 2015 includes $nil accrued interest (October 31, 2015 – $20 million). Series 2015 was redeemed on December 31, 2015. Series 2008-1 includes $11 million of accrued interest (October 31, 2015 – $11 million), net of $nil treasury holdings (October 31, 2015 – $6 million).

Note 22 Share-based compensation

Stock option plans
We have stock option plans for certain key employees. Under the plans, options are periodically granted to purchase common shares. The exercise price for the majority of the grants is determined as the higher of the volume-weighted average of the trading prices per board lot (100 shares) of our common shares on the Toronto Stock Exchange (i) on the day preceding the day of grant; and (ii) the five consecutive trading days immediately preceding the day of grant. The exercise price for the remaining grants is the closing market share price of our common shares on the New York Stock Exchange on the date of grant. All options vest over a four-year period, and are exercisable for a period not exceeding 10 years from the grant date.

The compensation expense recorded for the year ended October 31, 2016, in respect of the stock option plans was $8 million (October 31, 2015 – $6 million; October 31, 2014 – $7 million). The compensation expense related to non-vested options was $4 million at October 31, 2016 (October 31, 2015 – $3 million; October 31, 2014 – $4 million), to be recognized over the weighted average period of 1.9 years (October 31, 2015 – 1.8 years; October 31, 2014 – 1.4 years).

Analysis of the movement in the number and weighted average exercise price of options is set out below:

A summary of our stock option activity and related information

	October 31, 2016		October 31, 2015		October 31, 2014	
(Canadian dollars per share except share amounts)	**Number of options (thousands)**	**Weighted average exercise price** (4)	Number of options (thousands)	Weighted average exercise price	Number of options (thousands)	Weighted average exercise price
Outstanding at beginning of year	**8,182**	**$ 55.78**	8,579	$ 52.36	10,604	$ 50.39
Granted (1)	**7,403**	**55.74**	803	78.59	705	69.17
Exercised (2) (3)	**(4,825)**	**50.97**	(1,190)	46.44	(2,723)	49.03
Forfeited in the year	**(110)**	**69.79**	(10)	70.25	(7)	52.92
Outstanding at end of year	**10,650**	**$ 57.64**	8,182	$ 55.78	8,579	$ 52.36
Exercisable at end of year	**6,909**	**$ 49.47**	5,231	$ 50.75	4,987	$ 49.60
Available for grant	**9,267**		10,649		11,443	

(1) Total consideration in our acquisition of City National included share-based compensation amounts of US$156 million, including the conversion of 3.8 million stock options with a fair value of US$112 million, based on the Black-Scholes model. Refer to Note 11 for details on this acquisition.
(2) Cash received for options exercised during the year was $246 million (October 31, 2015 – $55 million; October 31, 2014 – $133 million) and the weighted average share price at the date of exercise was $76.90 (October 31, 2015 – $76.87; October 31, 2014 – $74.27).
(3) New shares were issued for all stock options exercised in 2016, 2015 and 2014.
(4) The weighted average exercise prices reflect the conversion of foreign currency-denominated options at the exchange rate as of October 31, 2016. For foreign currency-denominated options exercised during the year, the weighted average exercise prices are translated using exchange rates as at the settlement date.

Options outstanding as at October 31, 2016 by range of exercise price

	Options outstanding			Options exercisable	
(Canadian dollars per share except share amounts and years)	Number outstanding (thousands)	Weighted average exercise price (1)	Weighted average remaining contractual life (years)	Number exercisable (thousands)	Weighted average exercise price (1)
$20.17 – $45.70	**1,865**	**$ 37.35**	**3.52**	**1,865**	**$ 37.35**
$46.72 – $51.83	**2,007**	**48.83**	**4.60**	**2,007**	**48.83**
$52.60 – $58.43	**1,906**	**53.92**	**3.31**	**1,906**	**53.92**
$58.65 – $73.14	**2,198**	**63.61**	**6.45**	**1,000**	**61.32**
$74.39 – $78.59	**2,674**	**76.17**	**8.67**	**131**	**77.02**
	10,650	**$ 57.64**	**5.58**	**6,909**	**$ 49.47**

(1) The weighted average exercise prices reflect the conversion of foreign currency-denominated options at the exchange rate as of October 31, 2016.

The weighted average fair value of options granted during the year ended October 31, 2016 was estimated at $4.83 (October 31, 2015 – $6.75; October 31, 2014 – $7.19). This was determined by applying the Black-Scholes model on the date of grant, taking into account the specific terms and conditions under which the options are granted, such as the vesting period and expected share price volatility estimated by considering both historic average share price volatility and implied volatility derived from traded options over our common shares of similar maturity to those of the employee options. The following assumptions were used to determine the fair value of options granted:

Weighted average assumptions

	For the year ended		
(Canadian dollars per share except percentages and years)	**October 31 2016**	October 31 2015	October 31 2014
Share price at grant date	**$ 72.49**	$ 77.58	$ 68.75
Risk-free interest rate	**0.94%**	1.40%	1.95%
Expected dividend yield	**4.07%**	3.76%	3.94%
Expected share price volatility	**16%**	17%	18%
Expected life of option	**6 years**	6 years	6 years

Employee savings and share ownership plans

We offer many employees an opportunity to own our common shares through savings and share ownership plans. Under these plans, the employees can generally contribute between 1% and 10% of their annual salary or benefit base for commission-based employees. For each contribution between 1% and 6%, we will match 50% of the employee contributions in our common shares. For the RBC Dominion Securities Savings Plan, our maximum annual contribution is $4,500 per employee. For the RBC U.K. Share Incentive Plan, our maximum annual contribution is £1,500 per employee. For the year ended October 31, 2016, we contributed $91 million (October 31, 2015 – $88 million; October 31, 2014 – $85 million), under the terms of these plans, towards the purchase of our common shares. As at October 31, 2016, an aggregate of 37 million common shares were held under these plans (October 31, 2015 – 37 million common shares; October 31, 2014 – 38 million common shares).

Deferred share and other plans

We offer deferred share unit plans to executives, non-employee directors and to certain key employees. Under these plans, the executives or directors may choose to receive all or a percentage of their annual variable short-term incentive bonus or directors' fee in the form of deferred share units (DSUs). The executives or directors must elect to participate in the plan prior to the beginning of the year. DSUs earn dividend equivalents in the form of additional DSUs at the same rate as dividends on common shares. The participant is not allowed to convert the DSUs until retirement or termination of employment/directorship. The cash value of the DSUs is equivalent to the market value of common shares when conversion takes place.

We have a deferred bonus plan for certain key employees within Capital Markets. The deferred bonus is invested as RBC share units and a specified percentage vests on each of the three anniversary dates following the grant date. Each vested amount is paid in cash and is based on the original number of RBC share units plus accumulated dividends valued using the average closing price of RBC common shares during the five trading days immediately preceding the vesting date.

We offer performance deferred share award plans to certain key employees, all of which vest at the end of three years. Upon vesting, the award is paid in cash and is based on the original number of RBC share units granted plus accumulated dividends valued using the average closing price of RBC common shares during the five trading days immediately preceding the vesting date. A portion of the award under certain plans may be increased or decreased up to 25%, depending on our total shareholder return compared to a defined peer group of global financial institutions. We previously offered deferred compensation to certain employees in the form of common shares that were held in trust and accumulated dividends during the three year vesting period.

We maintain non-qualified deferred compensation plans for non-employee directors and certain key employees in the United States. These plans allow eligible directors and employees to defer a portion of their annual income and allocate the deferrals among specified fund choices, including a share unit fund that tracks the value of our common shares. Certain deferrals may also be eligible for matching contributions, all of which are allocated to the RBC share unit fund.

Our liabilities for the awards granted under the deferred share and other plans are measured at fair value, determined based on the quoted market price of our common shares. The following tables present our obligations under the deferred share and other plans, and the related compensation expenses (recoveries) recognized for the year.

Obligation under deferred share and other plans

(Millions of Canadian dollars except units and per unit amounts)	October 31, 2016 Units granted during the year: Number granted (thousands)	October 31, 2016 Units granted during the year: Weighted average fair value	October 31, 2016 Units outstanding at the end of the year: Carrying amount	October 31, 2015 Units granted during the year: Number granted (thousands)	October 31, 2015 Units granted during the year: Weighted average fair value	October 31, 2015 Units outstanding at the end of the year: Carrying amount	October 31, 2014 Units granted during the year: Number granted (thousands)	October 31, 2014 Units granted during the year: Weighted average fair value	October 31, 2014 Units outstanding at the end of the year: Carrying amount
Deferred share unit plans	**388**	**$ 74.89**	**$ 376**	343	$ 69.68	$ 334	315	$ 71.57	$ 333
Deferred bonus plan	**4,545**	**83.30**	**1,444**	5,849	75.60	1,442	5,339	78.97	1,585
Performance deferred share award plans	**2,656**	**74.49**	**502**	2,049	77.69	429	2,181	68.09	503
Deferred compensation plans	**124**	**72.52**	**333**	64	79.52	313	69	74.68	343
Other share-based plans	**1,394**	**76.04**	**157**	879	76.44	114	845	70.32	118
	9,107	**$ 79.11**	**$ 2,812**	9,184	$ 75.95	$ 2,632	8,749	$ 75.12	$ 2,882

Compensation expenses recognized under deferred share and other plans

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Deferred share unit plans	**$ 62**	$ (1)	$ 61
Deferred bonus plan	**195**	(139)	121
Performance deferred share award plans	**246**	135	243
Deferred compensation plans	**134**	36	147
Other share-based plans	**91**	39	65
	$ 728	$ 70	$ 637

Note 23 Income and expenses from selected financial instruments

Gains and losses arising from financial instruments held at FVTPL are reported in Non-interest income. Related interest and dividend income are reported in Net interest income.

Net gains (losses) from financial instruments held at fair value through profit or loss (1)

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Net gains (losses)			
Classified as at fair value through profit or loss (2)	**$ 371**	$ (218)	$ 922
Designated as at fair value through profit or loss (3)	**216**	750	(132)
	$ 587	$ 532	$ 790
By product line			
Interest rate and credit	**$ 404**	$ 149	$ 603
Equities	**(345)**	(89)	(190)
Foreign exchange and commodities	**528**	472	377
	$ 587	$ 532	$ 790

(1) The following related to our insurance operations are included in Insurance premiums, investment and fee income in the Consolidated Statements of Income: Net gains from financial instruments designated as at FVTPL of $617 million (October 31, 2015 – $51 million; October 31, 2014 – $515 million).
(2) Excludes derivatives designated in a hedging relationship. Refer to Note 8 for net gains (losses) on these derivatives.
(3) For the year ended October 31, 2016, $428 million of net fair value gains on financial liabilities designated as at FVTPL, other than those attributable to changes in our own credit risk, were included in Non-interest income (October 31, 2015 – gains of $1,118 million; October 31, 2014 – losses of $414 million).

Note 23 Income and expenses from selected financial instruments (continued)

Net interest income from financial instruments (1)

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Interest income			
Financial instruments held as at fair value through profit or loss	**$ 5,181**	$ 4,810	$ 4,246
Other categories of financial instruments (2)	**19,271**	17,919	17,773
	24,452	22,729	22,019
Interest expense			
Financial instruments held as at fair value through profit or loss	**$ 2,952**	$ 2,621	$ 2,198
Other categories of financial instruments	**4,969**	5,337	5,705
	7,921	7,958	7,903
Net interest income	**$ 16,531**	$ 14,771	$ 14,116

(1) The following related to our insurance operations are included in Insurance premiums, investment and fee income in the Consolidated Statements of Income: Interest income of $474 million (October 31, 2015 – $449 million; October 31, 2014 – $435 million), and Interest expense of $4 million (October 31, 2015 – $3 million; October 31, 2014 – $nil).
(2) Refer to Note 5 for interest income accrued on impaired financial assets.

Income from other categories of financial instruments (1), (2)

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Net gains (losses) arising from financial instruments measured at amortized cost (3)	**$ (22)**	$ (6)	$ (7)
Net fee income which does not form an integral part of the effective interest rate of financial assets and liabilities	**4,817**	4,604	4,190
Net fee income arising from trust and other fiduciary activities	**9,988**	9,587	9,138

(1) Refer to Note 4 for net gains (losses) on AFS securities.
(2) Refer to Note 4 for impairment losses on AFS and held-to-maturity securities, and Note 5 for impairment losses on loans.
(3) Financial instruments measured at amortized cost include held-to-maturity securities, loans and financial liabilities measured at amortized cost.

Note 24 Income taxes

The components of tax expense are as follows.

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Income taxes (recoveries) in Consolidated Statements of Income			
Current tax			
Tax expense for current year	**$ 3,012**	$ 2,244	$ 2,858
Adjustments for prior years	**(26)**	91	(64)
Recoveries arising from previously unrecognized tax loss, tax credit or temporary difference of a prior period	**(61)**	(5)	(4)
	2,925	2,330	2,790
Deferred tax			
Origination and reversal of temporary difference	**(111)**	312	(156)
Effects of changes in tax rates	**(3)**	35	(3)
Adjustments for prior years	**27**	(74)	74
Recoveries arising from previously unrecognized tax loss, tax credit or temporary difference of a prior period	**–**	(6)	(3)
Write-down	**3**	–	4
	(84)	267	(84)
	2,841	2,597	2,706
Income taxes (recoveries) in Consolidated Statements of Comprehensive Income and Changes in Equity			
Other comprehensive income			
Net unrealized gains (losses) on available-for-sale securities	**29**	(22)	70
Reclassification of net losses (gains) on available-for-sale securities to income	**(20)**	(12)	(12)
Unrealized foreign currency translation gains (losses)	**3**	8	5
Net foreign currency translation gains (losses) from hedging activities	**51**	(1,140)	(561)
Reclassification of losses (gains) on net investment hedging activities to income	**–**	38	1
Net gains (losses) on derivatives designated as cash flow hedges	**(13)**	(193)	(39)
Reclassification of losses (gains) on derivatives designated as cash flow hedges to income	**19**	117	10
Remeasurements of employee benefit plans	**(373)**	206	(88)
Net fair value change due to credit risk on financial liabilities designated as at fair value through profit or loss	**(118)**	127	(22)
Issuance costs	**(6)**	(7)	(7)
Share-based compensation awards	**(10)**	–	–
	(438)	(878)	(643)
Total income taxes	**$ 2,403**	$ 1,719	$ 2,063

Our effective tax rate changed from 20.6% for 2015 to 21.4% for 2016, principally due to net favorable tax adjustments last year.

The following is an analysis of the differences between the income tax expense reflected in the Consolidated Statements of Income and the amounts calculated at the Canadian statutory rate.

Reconciliation to statutory tax rate

	For the year ended					
(Millions of Canadian dollars, except for percentage amounts)	**October 31, 2016**		October 31, 2015		October 31, 2014	
Income taxes at Canadian statutory tax rate	**$ 3,524**	**26.5%**	$ 3,320	26.3%	$ 3,080	26.3%
Increase (decrease) in income taxes resulting from						
Lower average tax rate applicable to subsidiaries	**(340)**	**(2.6)**	(116)	(0.9)	(272)	(2.3)
Tax-exempt income from securities	**(410)**	**(3.1)**	(452)	(3.6)	(386)	(3.3)
Tax rate change	**(3)**	**–**	35	0.3	(3)	–
Effect of previously unrecognized tax loss, tax credit or temporary differences	**(61)**	**(0.4)**	(11)	(0.1)	(7)	(0.1)
Other	**131**	**1.0**	(179)	(1.4)	294	2.5
Income taxes in Consolidated Statements of Income / effective tax rate	**$ 2,841**	**21.4%**	$ 2,597	20.6%	$ 2,706	23.1%

Deferred tax assets and liabilities result from tax loss carryforwards and temporary differences between the tax basis of assets and liabilities and their carrying amounts on our Consolidated Balance Sheets.

Significant components of deferred tax assets and liabilities

	As at October 31, 2016					
(Millions of Canadian dollars)	**Net Asset November 1, 2015**	**Change through equity**	**Change through profit or loss**	**Exchange rate differences**	**Acquisitions/ disposals**	**Net Asset October 31, 2016**
Net deferred tax asset/(liability)						
Allowance for credit losses	**$ 372**	**$ –**	**$ 90**	**$ 2**	**$ 20**	**$ 484**
Deferred compensation	**1,296**	**10**	**40**	**23**	**189**	**1,558**
Business realignment charges	**6**	**–**	**2**	**–**	**–**	**8**
Tax loss carryforwards	**54**	**(1)**	**(19)**	**(2)**	**–**	**32**
Deferred income	**147**	**–**	**(32)**	**1**	**(21)**	**95**
Available-for-sale securities	**12**	**(12)**	**1**	**4**	**5**	**10**
Premises and equipment and intangibles	**(539)**	**–**	**62**	**(10)**	**(594)**	**(1,081)**
Deferred expense	**(86)**	**8**	**5**	**–**	**13**	**(60)**
Pension and post-employment related	**412**	**373**	**39**	**1**	**–**	**825**
Other	**197**	**8**	**(104)**	**(7)**	**(127)**	**(33)**
	$ 1,871	**$ 386**	**$ 84**	**$ 12**	**$ (515)**	**$ 1,838**
Comprising						
Deferred tax assets	**$ 2,072**					**$ 2,827**
Deferred tax liabilities	**(201)**					**(989)**
	$ 1,871					**$ 1,838**

	As at October 31, 2015					
(Millions of Canadian dollars)	Net Asset November 1, 2014	Change through equity	Change through profit or loss	Exchange rate differences	Acquisitions/ disposals	Net Asset October 31, 2015
Net deferred tax asset/(liability)						
Allowance for credit losses	$ 376	$ –	$ (2)	$ (2)	$ –	$ 372
Deferred compensation	1,513	–	(375)	158	–	1,296
Business realignment charges	9	–	(4)	1	–	6
Tax loss carryforwards	44	2	4	4	–	54
Deferred income	120	–	27	–	–	147
Available-for-sale securities	30	(8)	(13)	3	–	12
Premises and equipment and intangibles	(604)	–	81	(17)	1	(539)
Deferred expense	(98)	9	3	–	–	(86)
Pension and post-employment related	566	(201)	46	1	–	412
Other	222	–	(34)	10	(1)	197
	$ 2,178	$ (198)	$ (267)	$ 158	$ –	$ 1,871
Comprising						
Deferred tax assets	$ 2,382					$ 2,072
Deferred tax liabilities	(204)					(201)
	$ 2,178					$ 1,871

The tax loss carryforwards amount of deferred tax assets relates to losses in our Caribbean and Japanese operations. Deferred tax assets of $32 million were recognized at October 31, 2016 (October 31, 2015 – $54 million) in respect of tax losses incurred in current or preceding years

Note 24 Income taxes (continued)

for which recognition is dependent on the projection of future taxable profits. Management's forecasts support the assumption that it is probable that the results of future operations will generate sufficient taxable income to utilize the deferred tax assets. The forecasts rely on continued liquidity and capital support to our business operations, including tax planning strategies implemented in relation to such support.

As at October 31, 2016, unused tax losses, tax credits and deductible temporary differences of $372 million, $541 million and $3 million (October 31, 2015 – $525 million, $356 million and $6 million) available to be offset against potential tax adjustments or future taxable income were not recognized as deferred tax assets. This amount includes unused tax losses of $26 million which expire within one year (October 31, 2015 – $158 million), $3 million which expire in two to four years (October 31, 2015 – $28 million), and $343 million which expire after four years (October 31, 2015 – $339 million). There are $73 million of tax credits that will expire in two to four years (October 31, 2015 – $11 million) and $468 million that will expire after four years (October 31, 2015 – $345 million). In addition, there are no deductible temporary differences that will expire within one year (October 31, 2015 – $1 million) and $3 million that will expire after four years (October 31, 2015 – $5 million).

The amount of temporary differences associated with investments in subsidiaries, branches and associates and interests in joint ventures for which deferred tax liabilities have not been recognized in the parent bank is $11.7 billion as at October 31, 2016 (October 31, 2015 – $11.2 billion).

Tax examinations and assessments

In September 2016, the Canada Revenue Agency reassessed Royal Bank of Canada approximately $225 million of additional income tax and interest by denying the tax deductibility of certain dividends received from Canadian Corporations in years 2009 and 2010 on the basis that they were part of a "dividend rental arrangement." The circumstances of the dividends subject to the reassessment are similar to those prospectively addressed by the rules in the 2015 Canadian federal budget. We are confident that our tax filing position was appropriate and intend to defend ourselves vigorously.

Note 25 Earnings per share

	For the year ended		
(Millions of Canadian dollars, except share and per share amounts)	**October 31 2016**	October 31 2015	October 31 2014
Basic earnings per share			
Net Income	**$ 10,458**	$ 10,026	$ 9,004
Preferred share dividends	**(294)**	(191)	(213)
Net income attributable to non-controlling interest	**(53)**	(101)	(94)
Net income available to common shareholders	**10,111**	9,734	8,697
Weighted average number of common shares (in thousands)	**1,485,876**	1,442,935	1,442,553
Basic earnings per share (in dollars)	**$ 6.80**	$ 6.75	$ 6.03
Diluted earnings per share			
Net income available to common shareholders	**$ 10,111**	$ 9,734	$ 8,697
Dilutive impact of exchangeable shares	**15**	15	21
Net income available to common shareholders including dilutive impact of exchangeable shares	**10,126**	9,749	8,718
Weighted average number of common shares (in thousands)	**1,485,876**	1,442,935	1,442,553
Stock options (1)	**3,329**	2,446	2,938
Issuable under other share-based compensation plans	**731**	–	–
Exchangeable shares (2)	**4,201**	4,128	6,512
Average number of diluted common shares (in thousands)	**1,494,137**	1,449,509	1,452,003
Diluted earnings per share (in dollars)	**$ 6.78**	$ 6.73	$ 6.00

(1) The dilutive effect of stock options was calculated using the treasury stock method. When the exercise price of options outstanding is greater than the average market price of our common shares, the options are excluded from the calculation of diluted earnings per share. For the year ended October 31, 2016, an average of 802,371 outstanding options with an average exercise price of $78.58 were excluded from the calculation of diluted earnings per share. For the year ended October 31, 2015, an average of 703,808 outstanding options with an average exercise price of $78.59 were excluded from calculation of diluted earnings per share. For the year ended October 31, 2014, no outstanding options were excluded from the calculation of diluted earnings per share.

(2) Includes exchangeable preferred shares and trust capital securities.

Note 26 Guarantees, commitments, pledged assets and contingencies

Guarantees and commitments

We use guarantees and other off-balance sheet credit instruments to meet the financing needs of our clients.

The table below summarizes our maximum exposure to credit losses related to our guarantees and commitments provided to third parties. The maximum exposure to credit risk relating to a guarantee is the maximum risk of loss if there was a total default by the guaranteed parties, without consideration of possible recoveries under recourse provisions, insurance policies or from collateral held or pledged. The maximum exposure to credit risk relating to a commitment to extend credit is the full amount of the commitment. In both cases, the maximum risk exposure is significantly greater than the amount recognized as a liability in our Consolidated Balance Sheets.

(Millions of Canadian dollars)	Maximum exposure to credit losses As at October 31 2016	October 31 2015
Financial guarantees		
Financial standby letters of credit	**$ 18,886**	$ 17,494
Commitments to extend credit		
Backstop liquidity facilities	**38,910**	40,387
Credit enhancements	**2,598**	3,348
Documentary and commercial letters of credit	**232**	216
Other commitments to extend credit	**181,491**	172,924
Other credit-related commitments		
Securities lending indemnifications	**90,230**	74,239
Performance guarantees	**6,844**	6,042
Other	**50**	221

Our credit review process, our policy for requiring collateral security, and the types of collateral security held are generally the same for guarantees and commitments as for loans. Our clients generally have the right to request settlement of, or draw on, our guarantees and commitments within one year. However, certain guarantees can only be drawn if specified conditions are met. These conditions, along with collateral requirements, are described below. We believe that it is highly unlikely that all or substantially all of the guarantees and commitments will be drawn or settled within one year, and contracts may expire without being drawn or settled.

Financial guarantees

Financial standby letters of credit

Financial standby letters of credit represent irrevocable assurances that we will make payments in the event that a client cannot meet its payment obligations to the third party. For certain guarantees, the guaranteed party can request payment from us even though the client has not defaulted on its obligations. The term of these guarantees can range up to eight years.

Our policy for requiring collateral security with respect to these instruments and the types of collateral security held is generally the same as for loans. When collateral security is taken, it is determined on an account-by-account basis according to the risk of the borrower and the specifics of the transaction. Collateral security may include cash, securities and other assets pledged.

Commitments to extend credit

Backstop liquidity facilities

Backstop liquidity facilities are provided to asset-backed commercial paper conduit programs administered by us and third parties, as an alternative source of financing in the event that such programs are unable to access commercial paper markets, or in limited circumstances, when predetermined performance measures of the financial assets owned by these programs are not met. The average remaining term of these liquidity facilities is approximately four years.

Backstop liquidity facilities are also provided to non-asset backed programs such as variable rate demand notes issued by third parties. These standby facilities provide liquidity support to the issuer to buy the notes if the issuer is unable to remarket the notes, as long as the instrument and/or the issuer maintain the investment grade rating.

The terms of the backstop liquidity facilities do not require us to advance money to these programs in the event of bankruptcy or insolvency and generally do not require us to purchase non-performing or defaulted assets.

Credit enhancements

We provide partial credit enhancement to multi-seller programs administered by us to protect commercial paper investors in the event that the collections on the underlying assets together with the transaction-specific credit enhancements or the liquidity facilities prove to be insufficient to pay for maturing commercial paper. Each of the asset pools is structured to achieve a high investment-grade credit profile through credit enhancements from us and other third parties related to each transaction. The average remaining term of these credit facilities is approximately three years.

Documentary and commercial letters of credit

Documentary and commercial letters of credit, which are written undertakings by us on behalf of a client authorizing a third party to draw drafts on us up to a stipulated amount under specific terms and conditions, where some are collateralized based on the underlying agreement with the client and others are collateralized by cash deposits or other assets of the company which may include the underlying shipment of goods to which they relate.

Other commitments to extend credit

Commitments to extend credit represent unused portions of authorizations to extend credit in the form of loans, bankers' acceptances or letters of credit.

Other credit-related commitments

Securities lending indemnifications

In securities lending transactions, we act as an agent for the owner of a security, who agrees to lend the security to a borrower for a fee, under the terms of a pre-arranged contract. The borrower must fully collateralize the security loaned at all times. As part of this custodial business, an indemnification may be provided to securities lending customers to ensure that the fair value of securities loaned will be returned in the event that the borrower fails to return the borrowed securities and the collateral held is insufficient to cover the fair value of those securities. These indemnifications normally terminate without being drawn upon. The term of these indemnifications varies, as the securities loaned are recallable on demand. Collateral held for our securities lending transactions typically includes cash, securities that are issued or guaranteed by the Canadian government, U.S. government or other OECD countries or high quality equity instruments.

Performance guarantees
Performance guarantees represent irrevocable assurances that we will make payments to third-party beneficiaries in the event that a client fails to perform under a specified non-financial contractual obligation. Such obligations typically include works and service contracts, performance bonds, and warranties related to international trade. The term of these guarantees can range up to eight years.

Our policy for requiring collateral security with respect to these instruments and the types of collateral security held is generally the same as for loans. When collateral security is taken, it is determined on an account-by-account basis according to the risk of the borrower and the specifics of the transaction. Collateral security may include cash, securities and other assets pledged.

Indemnifications
In the normal course of our operations, we provide indemnifications which are often standard contractual terms to counterparties in transactions such as purchase and sale contracts, fiduciary, agency, licensing, custodial and service agreements, clearing system arrangements, director/officer contracts and leasing transactions. These indemnification agreements may require us to compensate the counterparties for costs incurred as a result of changes in laws and regulations (including tax legislation) or as a result of litigation claims or statutory sanctions that may be suffered by the counterparty as a consequence of the transaction. The terms of these indemnification agreements vary based on the contract. The nature of the indemnification agreements prevents us from making a reasonable estimate of the maximum potential amount we could be required to pay to counterparties. Historically, we have not made any significant payments under such indemnifications.

Uncommitted amounts
Uncommitted amounts represent undrawn credit facilities for which we have the ability to unilaterally withdraw the credit extended to the borrower. These include both retail and commercial commitments. As at October 31, 2016, the total balance of uncommitted amounts was $229 billion (October 31, 2015 – $209 billion).

Other commitments
We act as underwriter for certain new issuances under which we alone or together with a syndicate of financial institutions purchase the new issue for resale to investors. In connection with these activities, our commitments were $540 million as at October 31, 2016 (October 31, 2015 – $353 million).

Pledged assets and collateral
In the ordinary course of business, we pledge assets and enter in collateral agreements with terms and conditions that are usual and customary to our regular lending, borrowing and trading activities recorded on our Consolidated Balance Sheets. The following are examples of our general terms and conditions on pledged assets and collateral:

- The risks and rewards of the pledged assets reside with the pledgor.
- The pledged asset is returned to the pledgor when the necessary conditions have been satisfied.
- The right of the pledgee to sell or re-pledge the asset is dependent on the specific agreement under which the collateral is pledged.
- If there is no default, the pledgee must return the comparable asset to the pledgor upon satisfaction of the obligation.

We are also required to provide intraday pledges to the Bank of Canada when we use the Large Value Transfer System (LVTS), which is a real-time electronic wire transfer system that continuously processes all Canadian dollar large-value or time-critical payments throughout the day. The pledged assets earmarked for LVTS activities are normally released back to us at the end of the settlement cycle each day. Therefore, the pledged assets amount is not included in the table below. For the year ended October 31, 2016, we had on average $3.4 billion of assets pledged intraday to the Bank of Canada on a daily basis (October 31, 2015 – $3.5 billion). There are infrequent occasions where we are required to take an overnight advance from the Bank of Canada to cover a settlement requirement, in which case an equivalent value of the pledged assets would be used to secure the advance. There were no overnight advances taken on October 31, 2016 and October 31, 2015.

Details of assets pledged against liabilities and collateral assets held or re-pledged are shown in the following tables:

(Millions of Canadian dollars)	As at October 31 2016	As at October 31 2015
Sources of pledged assets and collateral		
Bank assets		
Interest-bearing deposits with banks	**$ –**	$ 1
Loans	**85,351**	81,397
Securities	**55,479**	63,761
Other assets	**23,307**	22,305
	$ 164,137	$ 167,464
Client assets (1)		
Collateral received and available for sale or re-pledging	**266,974**	232,499
Less: not sold or re-pledged	**(73,341)**	(74,471)
	193,633	158,028
	357,770	325,492
Uses of pledged assets and collateral		
Securities lent	**$ 25,057**	$ 21,767
Securities borrowed	**33,980**	33,306
Obligations related to securities sold short	**50,369**	47,658
Obligations related to securities lent or sold under repurchase agreements	**116,279**	88,834
Securitization	**43,502**	44,203
Covered bonds	**40,293**	36,422
Derivative transactions	**29,183**	27,411
Foreign governments and central banks	**1,574**	2,770
Clearing systems, payment systems and depositories	**3,521**	4,017
Other	**14,012**	19,104
	$ 357,770	$ 325,492

(1) Primarily relates to Obligations related to securities lent or sold under repurchase agreements, Securities lent and Derivative transactions.

Lease commitments

Finance lease commitments

We lease computer equipment from third parties under finance lease arrangements. The leases have various terms, escalation and renewal rights. The future minimum lease payments under the finance leases are as follows:

(Millions of Canadian dollars)	As at October 31, 2016 Total future minimum lease payments	Future interest charges	Present value of finance lease commitments	As at October 31, 2015 Total future minimum lease payments	Future interest charges	Present value of finance lease commitments
Future minimum lease payments						
No later than one year	**$ 21**	**$ (2)**	**$ 19**	$ 38	$ (4)	$ 34
Later than one year and no later than five years	**20**	**(2)**	**18**	22	(3)	19
	$ 41	**$ (4)**	**$ 37**	$ 60	$ (7)	$ 53

The net carrying amount of computer equipment held under finance lease as at October 31, 2016 was $47 million (October 31, 2015 – $65 million).

Operating lease commitments

We are obligated under a number of non-cancellable operating leases for premises and equipment. These leases have various terms, escalation and renewal rights. The lease agreements do not include any clauses that impose any restriction on our ability to pay dividends, engage in debt financing transactions, or enter into further lease agreements. The minimum future lease payments under non-cancellable operating leases are as follows.

(Millions of Canadian dollars)	As at October 31, 2016 Land and buildings	Equipment	As at October 31, 2015 Land and buildings	Equipment
Future minimum lease payments				
No later than one year	**$ 662**	**$ 70**	$ 590	$ 131
Later than one year and no later than five years	**1,993**	**206**	1,822	80
Later than five years	**2,140**	**–**	1,811	–
	4,795	**276**	4,223	211
Less: Future minimum sublease payments to be received	**(24)**	**–**	(14)	–
Net future minimum lease payments	**$ 4,771**	**$ 276**	$ 4,209	$ 211

Note 27 Legal and regulatory matters

We are a large global institution that is subject to many different complex legal and regulatory requirements that continue to evolve. We are and have been subject to a variety of legal proceedings, including civil claims and lawsuits, regulatory examinations, investigations, audits and requests for information by various governmental regulatory agencies and law enforcement authorities in various jurisdictions. Some of these matters may involve novel legal theories and interpretations and may be advanced under criminal as well as civil statutes, and some proceedings could result in the imposition of civil, regulatory enforcement or criminal penalties. We review the status of all proceedings on an ongoing basis and will exercise judgment in resolving them in such manner as we believe to be in our best interest. This is an area of significant judgment and uncertainty and the extent of our financial and other exposure to these proceedings after taking into account current accruals could be material to our results of operations in any particular period. The following is a description of our significant legal proceedings.

LIBOR regulatory investigations and litigation

Various regulators and competition and enforcement authorities around the world, including in Canada, the United Kingdom, and the U.S., are conducting investigations related to certain past submissions made by panel banks in connection with the setting of the U.S. dollar London interbank offered rate (LIBOR). These investigations focus on allegations of collusion between the banks that were on the panel to make submissions for certain LIBOR rates. Royal Bank of Canada is a member of certain LIBOR panels, including the U.S. dollar LIBOR panel, and has been the subject of regulatory requests for information. In addition, Royal Bank of Canada and other U.S. dollar panel banks have been named as defendants in private lawsuits filed in the U.S. with respect to the setting of LIBOR including a number of class action lawsuits which have been consolidated before the U.S. District Court for the Southern District of New York. The complaints in those private lawsuits assert claims against us and other panel banks under various U.S. laws, including U.S. antitrust laws, the U.S. Commodity Exchange Act, and state law.

Based on the facts currently known, it is not possible at this time for us to predict the ultimate outcome of these investigations or proceedings or the timing of their resolution.

Royal Bank of Canada Trust Company (Bahamas) Limited Proceedings

On April 13, 2015, a French investigating judge notified Royal Bank of Canada Trust Limited (RBC Bahamas) of the issuance of an ordonnance de renvoi referring RBC Bahamas and other unrelated persons to the French tribunal correctionnel to face the charge of complicity in estate tax fraud relating to actions taken relating to a trust for which RBC Bahamas serves as trustee. RBC Bahamas believes that its actions did not violate French law and contested the charge in the French court. The trial of this matter has concluded and a verdict is expected on January 12, 2017. On October 28, 2016, Royal Bank of Canada was granted a temporary one year exemption by the U.S. Department of Labour that will allow Royal Bank of Canada and its current and future affiliates to continue to qualify for the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act despite any potential conviction of RBC Bahamas in the French proceeding. An application to grant more lengthy exemptive relief is pending. Based on the facts currently known, it is not possible at this time to predict the ultimate outcome of the French proceeding; however, we believe that its ultimate resolution will not have a material effect on our consolidated financial position, although it may be material to our results of operations in the period it occurs.

Interchange fees litigation

Since 2011, seven proposed class actions have been commenced in Canada: *Bancroft-Snell v. Visa Canada Corporation, et al., 9085-4886 Quebec Inc. v. Visa Canada Corporation, et al., Coburn and Watson's Metropolitan Home v. Bank of America Corporation, et al. (Watson), Macaronies Hair Club and Laser Centre Inc. v. BofA Canada Bank, et al., 1023926 Alberta Ltd. v. Bank of America Corporation, et al., The Crown & Hand Pub Ltd. v. Bank of America Corporation, et al., and Hello Baby Equipment Inc. v. BofA Canada Bank, et al.* The defendants in each action are VISA Canada Corporation (Visa), MasterCard International Incorporated (MasterCard), Royal Bank of Canada and other financial institutions. The plaintiff class members are Canadian merchants who accept Visa and/or MasterCard branded credit cards for payment. The actions allege, among other things, that from March 2001 to the present, Visa and MasterCard conspired with their issuing banks and acquirers to set default interchange rates and merchant discount fees and that certain rules (Honour All Cards and No Surcharge) have the effect of increasing the merchant discount fees. The actions include claims of civil conspiracy, breach of the *Competition Act*, interference with economic relations and unjust enrichment. The claims seek unspecified general and punitive damages. In *Watson*, a decision to partially certify the action as a class proceeding was released on March 27, 2014, and was appealed. On August 19, 2015, the British Columbia Court of Appeal struck the plaintiff class representative's cause of action under section 45 of the *Competition Act* and reinstated the plaintiff class representative's cause of action in civil conspiracy by unlawful means, among other rulings. In October 2016, the trial court in *Watson* denied a motion by the plaintiff to revive the stricken section 45 *Competition Act* claim, and also denied the plaintiff's motion to add new causes of action. The plaintiff class representative has now appealed that decision. The *Watson* proceeding has been set down for trial commencing September 2018. Based on the facts currently known, it is not possible at this time for us to predict the ultimate outcome of this proceeding or the timing of its resolution.

Foreign Exchange Matters

Various regulators, including the Brazilian civil antitrust authority Administrative Council for Economic Defense (CADE) are conducting inquiries regarding potential violations of antitrust law by a number of banks, including Royal Bank of Canada, regarding foreign exchange trading.

On July 31, 2015, RBC Capital Markets, LLC was added as a defendant in a pending putative class action initially filed in November 2013 in the United States District Court for the Southern District of New York. The action is brought against multiple foreign exchange dealers and alleges, among other things, collusive behaviour in foreign exchange trading. On September 11, 2015, a class action lawsuit was filed in the Ontario Superior Court of Justice and a motion for authorization of a class action was filed in the Quebec Superior Court, both on behalf of an alleged class of Canadian investors, against Royal Bank of Canada, RBC Capital Markets, LLC and a number of other foreign exchange dealers. The Canadian class actions also allege collusive behaviour in foreign exchange trading. Based on the facts currently known, it is not possible at this time to predict the ultimate outcome of the Foreign Exchange Matters or the timing of their ultimate resolution.

Wisconsin school districts litigation

RBC Capital Markets, LLC, RBC Europe, Ltd. and RBC USA Holdco Corporation are defendants in a lawsuit relating to their role in transactions involving investments made by a number of Wisconsin school districts in certain CDOs. These CDO transactions were also the subject of a regulatory investigation and in September 2011, we reached a settlement with the Securities and Exchange Commission which was paid to the school districts through a Fair Fund. Based on the facts currently known, it is not possible at this time to predict the ultimate outcome of this proceeding or the timing of its resolution; however, we believe the ultimate resolution of this proceeding will not have a material adverse effect on our consolidated financial position or results of operations.

Panama Papers inquiries
Following media reports on the contents of files misappropriated from a Panamanian-based law firm, Mossack Fonseca & Co about special purpose entities associated with that firm, regulatory, tax and enforcement authorities are conducting inquiries. The inquiries focus on, among other issues, the potential use of such entities by third parties to avoid tax and disclosure obligations. Royal Bank of Canada has received, and is responding to, information and document requests by a number of such authorities.

Other matters
We are a defendant in a number of other actions alleging that certain of our practices and actions were improper. The lawsuits involve a variety of complex issues and the timing of their resolution is varied and uncertain. Management believes that we will ultimately be successful in resolving these lawsuits, to the extent that we are able to assess them, without material financial impact to the Bank. This is, however, an area of significant judgment and the potential liability resulting from these lawsuits could be material to our results of operations in any particular period.

Various other legal proceedings are pending that challenge certain of our other practices or actions. While this is an area of significant judgment and some matters are currently inestimable, we consider that the aggregate liability, to the extent that we are able to assess it, resulting from these other proceedings will not be material to our consolidated financial position or results of operations.

Note 28 Contractual repricing and maturity schedule

The following table details our exposure to interest rate risk. The carrying amounts of financial assets and financial liabilities are reported below based on the earlier of their contractual repricing date or maturity date.

The following table does not incorporate management's expectation of future events where expected repricing or maturity dates differ significantly from the contractual dates. We incorporate these assumptions in the management of interest rate risk exposure. These assumptions include expected repricing of trading instruments and certain loans and deposits. Taking into account these assumptions on the consolidated contractual repricing and maturity schedule at October 31, 2016, would result in a change in the under-one-year gap from $26.2 billion to $99.0 billion.

	As at October 31, 2016							
(Millions of Canadian dollars)	Immediately interest rate-sensitive	Under 3 months	3 to 6 months	6 to 12 months	1 to 5 years	Over 5 years	Non-rate-sensitive	Total
Assets								
Cash and deposits with banks	$ 14,036	$ 24,531	$ 26	$ 62	$ 385	$ 24	$ 3,716	$ 42,780
Trading securities	27	32,091	6,689	12,455	18,194	36,096	45,740	151,292
Available-for-sale securities	–	23,493	1,904	2,723	28,157	26,898	1,626	84,801
Assets purchased under reverse repurchase agreements and securities borrowed	1,533	160,416	17,233	6,115	–	–	1,005	186,302
Loans (net of allowance for loan losses)	171,994	90,913	12,811	36,741	185,674	16,015	7,456	521,604
Derivatives	118,944	–	–	–	–	–	–	118,944
Segregated fund net assets	–	–	–	–	–	–	981	981
Other assets	2	23,265	–	–	–	97	50,190	73,554
	$ 306,536	$ 354,709	$ 38,663	$ 58,096	$ 232,410	$ 79,130	$ 110,714	$ 1,180,258
Liabilities								
Deposits	$ 291,941	$ 134,929	$ 24,315	$ 40,176	$ 120,821	$ 20,982	$ 124,425	$ 757,589
Obligations related to assets sold under repurchase agreements and securities loaned	2,603	99,332	806	–	–	–	700	103,441
Obligations related to securities sold short	2	2,144	1,491	216	8,877	14,189	23,450	50,369
Derivatives	116,550	–	–	–	–	–	–	116,550
Segregated fund net liabilities	–	–	–	–	–	–	981	981
Other liabilities	43	14,540	26	57	1,852	7,194	46,242	69,954
Subordinated debentures	–	224	233	131	6,738	2,436	–	9,762
Non-controlling interests	–	–	–	–	511	–	84	595
Shareholders' equity	–	200	800	1,050	4,524	–	64,443	71,017
	$ 411,139	$ 251,369	$ 27,671	$ 41,630	$ 143,323	$ 44,801	$ 260,325	$ 1,180,258
Total gap	$ (104,603)	$ 103,340	$ 10,992	$ 16,466	$ 89,087	$ 34,329	$ (149,611)	$ –
Canadian dollar	$ (74,619)	$ 20,796	$ 1,841	$ 18,661	$ 115,791	$ (1,725)	$ (80,745)	$ –
Foreign currency	(29,984)	82,544	9,151	(2,195)	(26,704)	36,054	(68,866)	–
Total gap	$ (104,603)	$ 103,340	$ 10,992	$ 16,466	$ 89,087	$ 34,329	$ (149,611)	$ –

Note 29 Related party transactions

Related parties
Related parties include associated companies, post-employment benefit plans for the benefit of our employees, key management personnel (KMP), the Board of Directors (Directors), close family members of KMP and Directors, and entities which are, directly or indirectly, controlled by, jointly controlled by or significantly influenced by KMP, Directors or their close family members.

Key management personnel and Directors
KMP are defined as those persons having authority and responsibility for planning, directing and controlling our activities, directly or indirectly. They include the senior members of our organization called the Group Executive. The Group Executive is comprised of the President and Chief Executive Officer and individuals that report directly to him, including the Chief Administrative Officer and Chief Financial Officer, Chief Human Resources Officer, Group Chief Risk Officer, and Group Heads for Wealth Management and Insurance, Capital Markets and Investor & Treasury Services, Technology & Operations, and Personal & Commercial Banking. The Directors do not plan, direct, or control the activities of the entity; they oversee the management of the business and provide stewardship.

Compensation of key management personnel and Directors

	For the year ended		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014 (1)
Salaries and other short-term employee benefits (2)	**$ 26**	$ 21	$ 22
Post-employment benefits (3)	**2**	2	7
Share-based payments	**41**	37	26
	$ 69	$ 60	$ 55

(1) During the year ended October 31, 2014, certain executives who were members of the Bank's Group Executive as at October 31, 2013 left the Bank and therefore, were no longer part of KMP. Compensation for the year ended October 31, 2014, attributable to the former executives, including benefits and share-based payments relating to awards granted in prior years was $60 million.
(2) Includes the portion of the annual variable short-term incentive bonus that certain executives elected to receive in the form of DSUs. Refer to Note 22 for further details. Directors receive retainers but do not receive salaries and other short-term employee benefits.
(3) Directors do not receive post-employment benefits.

Stock options, stock awards and shares held by key management personnel, Directors and their close family members

	As at			
	October 31, 2016		October 31, 2015	
(Millions of Canadian dollars, except number of units)	**No. of units held**	**Value**	No. of units held	Value
Stock options (1)	**2,110,038**	**$ 42**	2,494,007	$ 44
Other non-option stock based awards (1)	**1,703,221**	**143**	1,485,976	111
RBC common and preferred shares	**789,295**	**66**	738,777	55
	4,602,554	**$ 251**	4,718,760	$ 210

(1) Directors do not receive stock options or any other non-option stock based awards.

Transactions, arrangements and agreements involving key management personnel, Directors and their close family members
In the normal course of business, we provide certain banking services to KMP, Directors, and their close family members. These transactions were made on substantially the same terms, including interest rates and security, as for comparable transactions with persons of a similar standing and did not involve more than the normal risk of repayment or present other unfavourable features.

As at October 31, 2016, total loans to KMP, Directors and their close family members were $10 million (October 31, 2015 – $7 million). We have no allowance or provision for credit losses relating to these loans as at and for the year ended October 31, 2016. No guarantees, pledges or commitments have been given to KMP, Directors or their close family members.

Joint ventures and associates
In the normal course of business, we provide certain banking and financial services to our joint ventures and associates, including loans, interest and non-interest bearing deposits. These transactions meet the definition of related party transactions and were made on substantially the same terms as for comparable transactions with third-party counterparties.

As at October 31, 2016, loans to joint ventures and associates were $71 million (October 31, 2015 – $65 million) and deposits from joint ventures and associates were $25 million (October 31, 2015 – $27 million). We have no allowance or provision for credit losses relating to loans to joint ventures and associates as at and for the year ended October 31, 2016. No guarantees have been given to joint ventures or associates.

Other transactions, arrangements or agreements involving joint ventures and associates

	As at or for the year ended		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014
Commitments and other contingencies	**$ 554**	$ 365	$ 315
Other fees received for services rendered	**40**	41	45
Other fees paid for services received	**189**	182	185

Note 30 Results by business segment

Composition of business segments

For management purposes, based on the products and services offered, we are organized into five business segments: Personal & Commercial Banking, Wealth Management, Insurance, Investor & Treasury Services and Capital Markets.

Personal & Commercial Banking is comprised of our personal and business banking operations, and our auto financing and retail investment businesses including our online discount brokerage channel and operates through four business lines: Personal Financial Services, Business Financial Services, Cards and Payment Solutions (Canadian Banking), and Caribbean & U.S. Banking. In Canada, we provide a broad suite of financial products and services through our extensive branch, automated teller machines, online, mobile and telephone banking networks, as well as through a large number of proprietary sales professionals. In the Caribbean, we offer a broad range of financial products and services to individuals, business clients and public institutions in targeted markets. In the U.S., we serve the cross-border banking needs of Canadian clients within the U.S. through online channels.

Wealth Management is comprised of Canadian Wealth Management, U.S. Wealth Management (including City National), International Wealth Management and Global Asset Management. We serve affluent, high net worth and ultra-high net worth clients in Canada, the U.S., the U.K., Europe, 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 as well as through RBC distribution channels and third-party distributors.

Insurance is comprised of our insurance operations in Canada and globally and operates under two business lines: Canadian Insurance and International Insurance, providing a wide range of life, health, home, auto, travel, wealth, group and reinsurance products and solutions. In Canada, we offer our products and services through our proprietary distribution channels, comprised of the field sales force which includes retail insurance branches, our field sales representatives, advice centers 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 is a specialist provider of asset services, custody, payments and treasury services for financial and other institutional investors worldwide. We also provide Canadian dollar cash management, correspondent banking and trade finance for financial institutions globally and short-term funding and liquidity management for RBC.

Capital Markets provides public and private companies, institutional investors, governments and central banks globally with a wide range of capital markets products and services across our two main business lines: Corporate and Investment Banking and Global Markets. 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 have a select presence in the U.K., Europe, and Other International, 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 and health care in Europe.

All other enterprise level activities that are not allocated to these five business segments, such as enterprise funding, securitizations, net charges associated with unattributed capital, and consolidation adjustments, including the elimination of the Taxable equivalent basis (Teb) gross-up amounts, are included in Corporate Support. Teb adjustments gross up income from certain tax-advantaged sources from Canadian taxable corporate dividends and U.S. tax credit investments recorded in Capital Markets to their effective tax equivalent value with the corresponding offset recorded in the provision for income taxes. Management believes that these Teb adjustments are necessary for Capital Markets to reflect how it is managed and enhances the comparability of revenue across our taxable and tax-advantaged sources. Our use of Teb adjustments may not be comparable to similarly adjusted amounts at other financial institutions. The Teb adjustment for the year ended October 31, 2016 was $736 million (October 31, 2015 – $570 million, October 31, 2014 – $492 million).

Geographic segments

For geographic reporting, our segments are grouped into Canada, United States and Other International. Transactions are primarily recorded in the location that best reflects the risk due to negative changes in economic conditions and prospects for growth due to positive economic changes. This location frequently corresponds with the location of the legal entity through which the business is conducted and the location of our clients. Transactions are recorded in the local currency and are subject to foreign exchange rate fluctuations with respect to the movement in the Canadian dollar.

Management reporting framework

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 our business segments are managed. This approach is intended to ensure that our business segments' results reflect all relevant revenue and expenses associated with the conduct of their businesses. Management regularly monitors these segments' results for the purpose of making decisions about resource allocation and performance assessment. These items do not impact our consolidated results.

The expenses in each business segment may include costs or services directly incurred or provided on their behalf at the enterprise level. For other costs not directly attributable to one of our business segments, we use a management reporting framework that uses assumptions, estimates and methodologies for allocating overhead costs and indirect expenses to our business segments and that assists in the attribution of capital and the transfer pricing of funds to our business segments in a manner that fairly and consistently measures and aligns the economic costs with the underlying benefits and risks of that specific business segment. Activities and business conducted between our business segments are generally at market rates. All other enterprise level activities that are not allocated to our five business segments are reported under Corporate Support.

Note 30 Results by business segment (continued)

Our assumptions and methodologies used in our management reporting framework are periodically reviewed by management to ensure that they remain valid. The capital attribution methodologies involve a number of assumptions and estimates that are revised periodically.

	For the year ended October 31, 2016									
(Millions of Canadian dollars)	Personal & Commercial Banking	Wealth Management (1)	Insurance	Investor & Treasury Services	Capital Markets (2)	Corporate Support (2)	Total	Canada	United States	Other International
Net interest income (3) (4)	$ 10,337	$ 1,955	$ –	$ 825	$ 3,804	$ (390)	$ 16,531	$ 11,685	$ 3,241	$ 1,605
Non-interest income	4,499	6,834	5,151	1,446	4,146	(202)	21,874	12,054	4,992	4,828
Total revenue	14,836	8,789	5,151	2,271	7,950	(592)	38,405	23,739	8,233	6,433
Provision for credit losses	1,122	48	1	(3)	327	51	1,546	1,231	254	61
Insurance policyholder benefits, claims and acquisition expense	–	–	3,424	–	–	–	3,424	2,304	–	1,120
Non-interest expense	6,757	6,801	622	1,460	4,466	30	20,136	10,229	6,151	3,756
Net income (loss) before income taxes	6,957	1,940	1,104	814	3,157	(673)	13,299	9,975	1,828	1,496
Income taxes (recoveries)	1,773	467	204	201	887	(691)	2,841	2,158	397	286
Net income	$ 5,184	$ 1,473	$ 900	$ 613	$ 2,270	$ 18	$ 10,458	$ 7,817	$ 1,431	$ 1,210
Non-interest expense includes:										
Depreciation and amortization	$ 338	$ 420	$ 17	$ 52	$ 22	$ 694	$ 1,543	$ 1,103	$ 302	$ 138
Impairment of other intangibles	–	–	–	–	–	3	3	3	–	–
Restructuring provisions	–	10	–	–	–	–	10	1	4	5
Total assets	$ 411,251	$ 91,901	$ 14,245	$ 139,701	$ 492,899	$ 30,261	$1,180,258	$614,834	$328,088	$ 237,336
Total assets include:										
Additions to premises and equipment and intangibles	$ 302	$ 2,532	$ 27	$ 63	$ 278	$ 386	$ 3,588	$ 849	$ 2,585	$ 154
Total liabilities	$ 411,320	$ 91,908	$ 14,281	$ 139,608	$ 493,044	$ (41,515)	$1,108,646	$543,072	$328,205	$ 237,369

	For the year ended October 31, 2015									
(Millions of Canadian dollars)	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets (2)	Corporate Support (2)	Total	Canada	United States	Other International
Net interest income (3) (4)	$ 10,004	$ 493	$ –	$ 818	$ 3,970	$ (514)	$ 14,771	$ 11,538	$ 1,977	$ 1,256
Non-interest income	4,309	6,282	4,436	1,220	4,093	210	20,550	10,889	4,619	5,042
Total revenue	14,313	6,775	4,436	2,038	8,063	(304)	35,321	22,427	6,596	6,298
Provision for credit losses	984	46	–	(1)	71	(3)	1,097	933	98	66
Insurance policyholder benefits, claims and acquisition expense	–	–	2,963	–	–	–	2,963	1,976	–	987
Non-interest expense	6,611	5,292	613	1,301	4,696	125	18,638	10,139	4,762	3,737
Net income (loss) before income taxes	6,718	1,437	860	738	3,296	(426)	12,623	9,379	1,736	1,508
Income taxes (recoveries)	1,712	396	154	182	977	(824)	2,597	1,727	649	221
Net income	$ 5,006	$ 1,041	$ 706	$ 556	$ 2,319	$ 398	$ 10,026	$ 7,652	$ 1,087	$ 1,287
Non-interest expense includes:										
Depreciation and amortization	$ 345	$ 157	$ 16	$ 54	$ 28	$ 639	$ 1,239	$ 1,046	$ 40	$ 153
Impairment of other intangibles	1	4	–	–	–	2	7	3	1	3
Restructuring provisions	–	83	–	–	–	–	83	25	45	13
Total assets	$ 397,132	$ 26,891	$ 14,139	$ 132,294	$ 478,289	$ 25,463	$1,074,208	$584,419	$252,845	$ 236,944
Total assets include:										
Additions to premises and equipment and intangibles	$ 327	$ 122	$ 23	$ 46	$ 256	$ 644	$ 1,418	$ 1,071	$ 206	$ 141
Total liabilities	$ 397,157	$ 26,906	$ 14,160	$ 132,275	$ 478,291	$ (38,525)	$1,010,264	$520,420	$252,970	$ 236,874

(Millions of Canadian dollars)	Personal & Commercial Banking	Wealth Management	Insurance	Investor & Treasury Services	Capital Markets (2)	Corporate Support (2)	Total	Canada	United States	Other International
	For the year ended October 31, 2014									
Net interest income (3) (4)	$ 9,743	$ 469	$ –	$ 732	$ 3,485	$ (313)	$ 14,116	$ 11,128	$ 1,697	$ 1,291
Non-interest income	3,987	5,844	4,964	1,152	3,881	164	19,992	10,488	4,257	5,247
Total revenue	13,730	6,313	4,964	1,884	7,366	(149)	34,108	21,616	5,954	6,538
Provision for credit losses	1,103	19	–	–	44	(2)	1,164	922	52	190
Insurance policyholder benefits, claims and acquisition expense	–	–	3,573	–	–	–	3,573	2,188	1	1,384
Non-interest expense	6,563	4,800	579	1,286	4,344	89	17,661	9,650	4,199	3,812
Net income (loss) before income taxes	6,064	1,494	812	598	2,978	(236)	11,710	8,856	1,702	1,152
Income taxes (recoveries)	1,589	411	31	157	923	(405)	2,706	1,983	660	63
Net income	$ 4,475	$ 1,083	$ 781	$ 441	$ 2,055	$ 169	$ 9,004	$ 6,873	$ 1,042	$ 1,089
Non-interest expense includes:										
Depreciation and amortization	$ 338	$ 147	$ 16	$ 58	$ 28	$ 578	$ 1,165	$ 971	$ 39	$ 155
Impairment of other intangibles	–	6	–	–	2	–	8	2	6	–
Restructuring provisions	20	16	–	–	–	–	36	–	16	20
Total assets	$ 376,188	$ 27,084	$ 12,930	$ 103,822	$ 400,314	$ 20,212	$ 940,550	$ 496,120	$ 194,879	$ 249,551
Total assets include:										
Additions to premises and equipment and intangibles	$ 318	$ 105	$ 16	$ 30	$ 147	$ 563	$ 1,179	$ 924	$ 154	$ 101
Total liabilities	$ 376,154	$ 27,022	$ 12,988	$ 103,798	$ 400,114	$ (34,029)	$ 886,047	$ 441,607	$ 194,946	$ 249,494

(1) In the first quarter of 2016, we changed the organizational structure of our Wealth Management operations resulting in a new operating segment U.S. Wealth Management (including City National) representing our legacy U.S. Wealth Management operations and City National. This new operating segment is combined with our other Wealth Management operations as a single reportable segment because they have comparable products, regulatory frameworks, processes, customers and distribution channels, and show similar economic characteristics (such as pre-tax margin).
(2) Taxable equivalent basis.
(3) Inter-segment revenue and share of profits in joint ventures and associates are not material.
(4) Interest revenue is reported net of interest expense as management relies primarily on net interest income as a performance measure.

Note 31 Nature and extent of risks arising from financial instruments

We are exposed to credit, market and liquidity and funding risks as a result of holding financial instruments. Our risk measurement and objectives, policies and methodologies for managing these risks are disclosed in the shaded text along with those tables specifically marked with an asterisk (*) on pages 54 to 82 of the Management's Discussion and Analysis. These shaded text and tables are an integral part of these Consolidated Financial Statements.

Concentrations of credit risk exist if a number of our counterparties are engaged in similar activities, are located in the same geographic region or have comparable economic characteristics such that their ability to meet contractual obligations would be similarly affected by changes in economic, political or other conditions.

Concentrations of credit risk indicate the relative sensitivity of our performance to developments affecting a particular industry or geographic location. The amounts of credit exposure associated with certain of our on- and off-balance sheet financial instruments are summarized in the following table.

	As at October 31, 2016									
(Millions of Canadian dollars, except percentage amounts)	Canada	%	United States	%	Europe	%	Other International	%	Total	
On-balance sheet assets other than derivatives (1)	$ 485,575	67%	$ 141,703	20%	$ 55,610	8%	$ 40,096	5%	$ 722,984	
Derivatives before master netting agreements (2) (3)	19,393	9	23,091	11	167,084	76	7,950	4	217,518	
	$ 504,968	54%	$ 164,794	17%	$ 222,694	24%	$ 48,046	5%	$ 940,502	
Off-balance sheet credit instruments (4)										
Committed and uncommitted (5)	$ 254,680	57%	$ 151,028	33%	$ 32,983	7%	$ 13,425	3%	$ 452,116	
Other	62,725	54	18,236	16	34,032	29	1,017	1	116,010	
	$ 317,405	56%	$ 169,264	30%	$ 67,015	12%	$ 14,442	2%	$ 568,126	

	As at October 31, 2015									
(Millions of Canadian dollars, except percentage amounts)	Canada	%	United States	%	Europe	%	Other International	%	Total	
On-balance sheet assets other than derivatives (1)	$ 453,650	68%	$ 110,341	17%	$ 56,984	9%	$ 41,453	6%	$ 662,428	
Derivatives before master netting agreements (2) (3)	20,911	11	22,877	12	143,414	74	7,254	3	194,456	
	$ 474,561	55%	$ 133,218	16%	$ 200,398	23%	$ 48,707	6%	$ 856,884	
Off-balance sheet credit instruments (4)										
Committed and uncommitted (5)	$ 239,351	57%	$ 137,204	33%	$ 32,638	8%	$ 10,312	2%	$ 419,505	
Other	49,740	51	17,520	18	29,213	30	1,523	1	97,996	
	$ 289,091	56%	$ 154,724	30%	$ 61,851	12%	$ 11,835	2%	$ 517,501	

(1) Includes assets purchased under reverse repurchase agreements and securities borrowed, loans and customers' liability under acceptances. The largest concentrations in Canada are Ontario at 49% (October 31, 2015 – 47%), the Prairies at 20% (October 31, 2015 – 21%), British Columbia and the territories at 15% (October 31, 2015 – 16%) and Quebec at 11% (October 31, 2015 – 11%). No industry accounts for more than 36% (October 31, 2015 – 35%) of total on-balance sheet credit instruments.

(2) A further breakdown of our derivative exposures by risk rating and counterparty type is provided in Note 8.

(3) Excludes credit derivatives classified as other than trading.

(4) Balances presented are contractual amounts representing our maximum exposure to credit risk.

(5) Represents our maximum exposure to credit risk. Retail and wholesale commitments respectively comprise 36% and 64% of our total commitments (October 31, 2015 – 36% and 64%). The largest concentrations in the wholesale portfolio relate to Financing products at 14% (October 31, 2015 – 15%), Non-bank financial services at 9% (October 31, 2015 – 10%), Real estate & related at 9% (October 31, 2015 – 8%), Technology & media at 8% (October 31, 2015 – 8%), and Utilities at 8% (October 31, 2015 – 9%).

Note 32 Capital management

Regulatory capital and capital ratios

OSFI formally establishes risk-based capital and leverage targets for deposit-taking institutions in Canada. We are required to calculate our capital ratios using the Basel III framework. Under Basel III, regulatory capital includes Common Equity Tier 1 (CET1), Tier 1 and Tier 2 capital. CET1 capital mainly consists of common shares, retained earnings and other components of equity. Regulatory adjustments under Basel III include deductions of goodwill and other intangibles, certain deferred tax assets, defined benefit pension fund assets, investments in banking, financial and insurance entities, and the shortfall of provisions to expected losses. Tier 1 capital comprises predominantly CET1, with additional items that consist of capital instruments such as certain preferred shares, and certain non-controlling interests in subsidiaries. Tier 2 capital includes subordinated debentures that meet certain criteria and certain loan loss allowances. Total capital is the sum of CET1, additional Tier 1 capital and Tier 2 capital.

Regulatory capital ratios are calculated by dividing CET1, Tier 1 and Total capital by risk-weighted assets. The leverage ratio is calculated by dividing Tier 1 capital by an exposure measure. The exposure measure consists of total assets (excluding items deducted from Tier 1 capital) and certain off-balance sheet items converted into credit exposure equivalents. Adjustments are also made to derivatives and secured financing transactions to reflect credit and other risks.

During 2016, we complied with all capital and leverage requirements imposed by OSFI.

	As at	
(Millions of Canadian dollars, except Capital ratios and leverage ratios)	**October 31 2016**	October 31 2015
Capital (1)		
Common Equity Tier 1 capital	**$ 48,181**	$ 43,715
Tier 1 capital	**55,270**	50,541
Total capital	**64,950**	58,004
Risk-weighted assets used in calculation of capital ratios (1) (2)		
Common Equity Tier 1 capital ratio	**447,436**	411,756
Tier 1 capital ratio	**448,662**	412,941
Total capital ratio	**449,712**	413,957
Total capital risk-weighted assets (1)		
Credit risk	**369,751**	323,870
Market risk	**23,964**	39,786
Operational risk	**55,997**	50,301
	$ 449,712	$ 413,957
Capital ratios and leverage ratios (1)		
Common Equity Tier 1 capital ratio	**10.8%**	10.6%
Tier 1 capital ratio	**12.3%**	12.2%
Total capital ratio	**14.4%**	14.0%
Leverage ratio	**4.4%**	4.3%
Leverage ratio exposure (billions)	**$ 1,265.1**	$ 1,170.2

(1) Capital, risk-weighted assets and capital ratios are calculated using OSFI Capital Adequacy Requirements. Leverage ratio is calculated using OSFI Leverage Requirements.

(2) Effective the third quarter of 2014, the credit valuation adjustment to our risk-weighted asset calculation implemented in the first quarter of 2014 must reflect different percentages for each tier of capital. This change reflects a phase-in of credit valuation adjustments ending in the fourth quarter of 2018. During this phase-in period, risk-weighted assets for Common Equity Tier 1, Tier 1 and Total capital ratios will be subject to different annual credit valuation adjustment percentages.

Note 33 Offsetting financial assets and financial liabilities

Offsetting within our Consolidated Balance Sheets may be achieved where financial assets and liabilities are subject to master netting arrangements that provide the currently enforceable right of offset and where there is an intention to settle on a net basis, or realize the assets and liabilities simultaneously. For derivative contracts and repurchase and reverse repurchase arrangements, this is generally achieved when there is a market mechanism for settlement (e.g., central counterparty exchange, or clearing house) which provides daily net settlement of cash flows arising from these contracts. Margin receivables and margin payables are generally offset as they settle simultaneously through a market settlement mechanism. These are generally presented in Other assets or Other liabilities.

Amounts that do not qualify for offsetting include master netting arrangements that only permit outstanding transactions with the same counterparty to be offset in an event of default or occurrence of other predetermined events. Such master netting arrangements include the ISDA Master Agreement or derivative exchange or clearing counterparty agreements for derivative contracts, global master repurchase agreement and global master securities lending agreements for repurchase, reverse repurchase and other similar secured lending and borrowing arrangements.

The amount of financial collateral received or pledged subject to master netting arrangements or similar agreements but not qualified for offsetting refers to the collateral received or pledged to cover the net exposure between counterparties by enabling the collateral to be realized in an event of default or the occurrence of other predetermined events. Certain amounts of collateral are restricted from being sold or re-pledged unless there is an event of default or the occurrence of other predetermined events.

Note 33 Offsetting financial assets and financial liabilities (continued)

The tables below provide the amount of financial instruments that have been offset on the Consolidated Balance Sheets and the amounts that do not qualify for offsetting but are subject to enforceable master netting arrangements or similar agreements. The amounts presented are not intended to represent our actual exposure to credit risk.

Financial assets subject to offsetting, enforceable master netting arrangements and similar agreements

	As at October 31, 2016							
	Amounts subject to offsetting and enforceable netting arrangements							
				Amounts subject to master netting arrangements or similar agreements but do not qualify for offsetting on the balance sheet (1)				
	Gross amounts of financial assets before balance sheet offsetting	Amounts of financial liabilities offset on the balance sheet	Net amount of financial assets presented on the balance sheet	Impact of master netting agreements	Financial collateral received (2)	Net amount	Amounts not subject to enforceable netting arrangements	Total amount recognized on the balance sheet
Assets purchased under reverse repurchase agreements and securities borrowed	$ 199,586	$ 14,290	$ 185,296	$ 422	$ 184,359	$ 515	$ 1,006	$ 186,302
Derivative assets (3)	208,936	97,142	111,794	79,296	17,249	15,249	7,150	118,944
Other financial assets	1,244	803	441	–	46	395	91	532
	$ 409,766	$ 112,235	$ 297,531	$ 79,718	$ 201,654	$ 16,159	$ 8,247	$ 305,778

	As at October 31, 2015							
	Amounts subject to offsetting and enforceable netting arrangements							
				Amounts subject to master netting arrangements or similar agreements but do not qualify for offsetting on the balance sheet (1)				
	Gross amounts of financial assets before balance sheet offsetting	Amounts of financial liabilities offset on the balance sheet	Net amount of financial assets presented on the balance sheet	Impact of master netting agreements	Financial collateral received (2)	Net amount	Amounts not subject to enforceable netting arrangements	Total amount recognized on the balance sheet
Assets purchased under reverse repurchase agreements and securities borrowed	$ 183,493	$ 9,846	$ 173,647	$ 30	$ 172,910	$ 707	$ 1,076	$ 174,723
Derivative assets (3)	185,654	87,527	98,127	71,833	14,956	11,338	7,499	105,626
Other financial assets	1,560	1,283	277	–	52	225	78	355
	$ 370,707	$ 98,656	$ 272,051	$ 71,863	$ 187,918	$ 12,270	$ 8,653	$ 280,704

(1) Financial collateral is reflected at fair value. The amount of financial instruments and financial collateral disclosed is limited to the net balance sheet exposure, and any over-collateralization is excluded from the table.
(2) Includes cash collateral of $11 billion (October 31, 2015 – $11 billion) and non-cash collateral of $191 billion (October 31, 2015 – $177 billion).
(3) Includes cash margin of $2.2 billion (October 31, 2015 – $1.5 billion) which offset against the derivative balance on the balance sheet.

Financial liabilities subject to offsetting, enforceable master netting arrangements and similar agreements

	As at October 31, 2016							
	Amounts subject to offsetting and enforceable netting arrangements							
				Amounts subject to master netting arrangements or similar agreements but do not qualify for offsetting on the balance sheet (1)				
	Gross amounts of financial liabilities before balance sheet offsetting	Amounts of financial assets offset on the balance sheet	Net amount of financial liabilities presented on the balance sheet	Impact of master netting agreements	Financial collateral pledged (2)	Net amount	Amounts not subject to enforceable netting arrangements	Total amount recognized on the balance sheet
Obligations related to assets sold under repurchase agreements and securities loaned	$ 117,031	$ 14,290	$ 102,741	$ 422	$ 102,029	$ 290	$ 700	$ 103,441
Derivative liabilities (3)	203,874	96,231	107,643	79,296	15,993	12,354	8,907	116,550
Other financial liabilities	3,271	2,231	1,040	–	514	526	15	1,055
	$ 324,176	$ 112,752	$ 211,424	$ 79,718	$ 118,536	$ 13,170	$ 9,622	$ 221,046

	As at October 31, 2015							
	Amounts subject to offsetting and enforceable netting arrangements							
				Amounts subject to master netting arrangements or similar agreements but do not qualify for offsetting on the balance sheet (1)				
	Gross amounts of financial liabilities before balance sheet offsetting	Amounts of financial assets offset on the balance sheet	Net amount of financial liabilities presented on the balance sheet	Impact of master netting agreements	Financial collateral pledged (2)	Net amount	Amounts not subject to enforceable netting arrangements	Total amount recognized on the balance sheet
Obligations related to assets sold under repurchase agreements and securities loaned	$ 92,564	$ 9,846	$ 82,718	$ 30	$ 82,476	$ 212	$ 570	$ 83,288
Derivative liabilities (3)	186,400	87,960	98,440	71,833	15,060	11,547	9,420	107,860
Other financial liabilities	2,348	1,517	831	–	551	280	3	834
	$ 281,312	$ 99,323	$ 181,989	$ 71,863	$ 98,087	$ 12,039	$ 9,993	$ 191,982

(1) Financial collateral is reflected at fair value. The amount of financial instruments and financial collateral disclosed is limited to the net balance sheet exposure, and any over-collateralization is excluded from the table.
(2) Includes cash collateral of $14 billion (October 31, 2015 – $13 billion) and non-cash collateral of $105 billion (October 31, 2015 – $85 billion).
(3) Includes cash margin of $0.8 billion (October 31, 2015 – $1.3 billion) which offset against the derivative balance on the balance sheet.

Note 34 Recovery and settlement of on-balance sheet assets and liabilities

The table below presents an analysis of assets and liabilities recorded on our Consolidated Balance Sheets by amounts to be recovered or settled within one year and after one year, as at the balance sheet date, based on contractual maturities and certain other assumptions outlined in the footnotes below. As warranted, we manage the liquidity risk of various products based on historical behavioural patterns that are often not aligned with contractual maturities. Amounts to be recovered or settled within one year, as presented below, may not be reflective of management's long-term view of the liquidity profile of certain balance sheet categories.

	As at					
	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	**Within one year**	**After one year**	**Total**	Within one year	After one year	Total
Assets						
Cash and due from banks (1)	**$ 12,049**	**$ 2,880**	**$ 14,929**	$ 10,466	$ 1,986	$ 12,452
Interest-bearing deposits with banks	**27,850**	**1**	**27,851**	22,690	–	22,690
Securities						
Trading (2)	**142,045**	**9,247**	**151,292**	149,150	9,553	158,703
Available-for-sale	**12,153**	**72,648**	**84,801**	12,338	44,467	56,805
Assets purchased under reverse repurchase agreements and securities borrowed	**182,618**	**3,684**	**186,302**	172,122	2,601	174,723
Loans						
Retail	**81,683**	**287,787**	**369,470**	92,012	256,171	348,183
Wholesale	**34,887**	**119,482**	**154,369**	25,842	100,227	126,069
Allowance for loan losses			**(2,235)**			(2,029)
Segregated fund net assets	**–**	**981**	**981**	–	830	830
Other						
Customers' liability under acceptances	**12,841**	**2**	**12,843**	13,446	7	13,453
Derivatives (2)	**116,533**	**2,411**	**118,944**	103,618	2,008	105,626
Premises and equipment, net	**–**	**2,836**	**2,836**	–	2,728	2,728
Goodwill	**–**	**11,156**	**11,156**	–	9,289	9,289
Other intangibles	**–**	**4,648**	**4,648**	–	2,814	2,814
Other assets	**33,754**	**8,317**	**42,071**	35,350	6,522	41,872
	$ 656,413	**$ 526,080**	**$ 1,180,258**	$ 637,034	$ 439,203	$ 1,074,208
Liabilities						
Deposits (3)	**$ 579,571**	**$ 178,018**	**$ 757,589**	$ 528,109	$ 169,118	$ 697,227
Segregated fund net liabilities	**–**	**981**	**981**	–	830	830
Other						
Acceptances	**12,841**	**2**	**12,843**	13,446	7	13,453
Obligations related to securities sold short	**41,927**	**8,442**	**50,369**	41,156	6,502	47,658
Obligations related to assets sold under repurchase agreements and securities loaned	**103,412**	**29**	**103,441**	82,498	790	83,288
Derivatives (2)	**114,321**	**2,229**	**116,550**	105,271	2,589	107,860
Insurance claims and policy benefit liabilities	**118**	**9,046**	**9,164**	97	9,013	9,110
Other liabilities	**33,314**	**14,633**	**47,947**	28,563	14,913	43,476
Subordinated debentures	**–**	**9,762**	**9,762**	1,500	5,862	7,362
	$ 885,504	**$ 223,142**	**$ 1,108,646**	$ 800,640	$ 209,624	$ 1,010,264

(1) Cash and due from banks are assumed to be recovered within one year, except for cash balances not available for use by the Bank.

(2) Trading securities classified as at FVTPL and trading derivatives not designated in hedging relationships are presented as within one year as this best represents in most instances the short-term nature of our trading activities. Non-trading derivatives designated in hedging relationships are presented according to the recovery or settlement of the related hedged item.

(3) Demand deposits of $358 billion (October 31, 2015 – $312 billion) are presented as within one year due to their being repayable on demand or at short notice on a contractual basis. In practice, these deposits relate to a broad range of individuals and customer-types which form a stable base for our operations and liquidity needs.

Note 35 Parent company information

The following table presents information regarding the legal entity of Royal Bank of Canada with its subsidiaries presented on an equity accounted basis.

Condensed Balance Sheets

	As at	
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015
Assets		
Cash and due from banks	**$ 3,164**	$ 3,123
Interest-bearing deposits with banks	**16,126**	15,838
Securities	**132,100**	130,326
Investments in bank subsidiaries and associated corporations (1)	**30,248**	22,907
Investments in other subsidiaries and associated corporations	**61,705**	60,378
Assets purchased under reverse repurchase agreements and securities borrowed	**25,129**	23,418
Loans, net of allowance for loan losses	**458,675**	444,169
Net balances due from bank subsidiaries (1)	**5,437**	19,118
Other assets	**162,790**	147,330
	$ 895,374	$ 866,607
Liabilities and shareholders' equity		
Deposits	**$ 573,933**	$ 566,903
Net balances due to other subsidiaries	**55,473**	66,879
Other liabilities	**185,583**	163,379
	814,989	797,161
Subordinated debentures	**9,368**	7,300
Shareholders' equity	**71,017**	62,146
	$ 895,374	$ 866,607

(1) Bank refers primarily to regulated deposit-taking institutions and securities firms.

Condensed Statements of Income and Comprehensive Income

	For the year ended		
(Millions of Canadian dollars)	**October 31 2016**	October 31 2015	October 31 2014
Interest income (1)	**$ 17,542**	$ 18,287	$ 18,415
Interest expense	**5,486**	5,785	5,882
Net interest income	**12,056**	12,502	12,533
Non-interest income (2)	**3,896**	5,474	6,007
Total revenue	**15,952**	17,976	18,540
Provision for credit losses	**1,456**	1,027	1,010
Non-interest expense	**8,014**	8,051	7,801
Income before income taxes	**6,482**	8,898	9,729
Income taxes	**1,544**	1,939	2,283
Net income before equity in undistributed income of subsidiaries	**4,938**	6,959	7,446
Equity in undistributed income of subsidiaries	**5,520**	3,067	1,558
Net income	**10,458**	10,026	9,004
Other comprehensive income, net of taxes	**(1,097)**	3,153	915
Total comprehensive income	**$ 9,361**	$ 13,179	$ 9,919

(1) Includes dividend income from investments in subsidiaries and associated corporations of $23 million (2015 – $120 million; 2014 – $10 million).
(2) Includes share of profit from associated corporations of $19 million (2015 – profit of $15 million; 2014 – profit of $7 million).

Condensed Statements of Cash Flows

(Millions of Canadian dollars)	For the year ended October 31 2016	October 31 2015	October 31 2014
Cash flows from operating activities			
Net income	**$ 10,458**	$ 10,026	$ 9,004
Adjustments to determine net cash from operating activities:			
Change in undistributed earnings of subsidiaries	**(5,520)**	(3,067)	(1,558)
Change in deposits, net of securitizations	**7,030**	70,802	41,428
Change in loans, net of securitizations	**(14,488)**	(33,904)	(22,865)
Change in trading securities	**9,004**	(10,663)	(4,193)
Change in obligations related to assets sold under repurchase agreements and securities loaned	**8,511**	2,687	(2,712)
Change in assets purchased under reverse repurchase agreements and securities borrowed	**(1,711)**	(6,343)	(2,497)
Change in obligations related to securities sold short	**3,145**	(1,244)	(1,305)
Other operating activities, net	**(2,736)**	(7,845)	182
Net cash from (used in) operating activities	**13,693**	20,449	15,484
Cash flows from investing activities			
Change in interest-bearing deposits with banks	**(288)**	(10,050)	(3,081)
Proceeds from sale of available-for-sale securities	**2,868**	620	1,225
Proceeds from maturity of available-for-sale securities	**20,802**	25,207	28,875
Purchases of available-for-sale securities	**(33,668)**	(36,408)	(36,165)
Net acquisitions of premises and equipment and other intangibles	**(750)**	(937)	(803)
Change in cash invested in subsidiaries	**(3,140)**	(978)	(2,409)
Change in net funding provided to subsidiaries	**2,275**	2,081	4,889
Proceeds from sale of associated corporations	**–**	4	70
Net cash (used in) from investing activities	**(11,901)**	(20,461)	(7,399)
Cash flows from financing activities			
Issue of subordinated debentures	**3,606**	1,000	2,000
Repayment of subordinated debentures	**(1,500)**	(1,700)	(1,600)
Issue of preferred shares	**1,475**	1,350	1,000
Issuance costs	**(16)**	(21)	(14)
Redemption of preferred shares	**–**	(325)	(1,525)
Issue of common shares	**307**	62	150
Common shares purchased for cancellation	**(362)**	–	(113)
Preferred shares purchased for cancellation	**(264)**	–	–
Dividends paid	**(4,997)**	(4,564)	(4,211)
Net cash used in financing activities	**(1,751)**	(4,198)	(4,313)
Net change in cash and due from banks	**41**	(4,210)	3,772
Cash and due from banks at beginning of year	**3,123**	7,333	3,561
Cash and due from banks at end of year	**$ 3,164**	$ 3,123	$ 7,333
Supplemental disclosure of cash flow information			
Amount of interest paid in year	**$ 5,331**	$ 5,786	$ 5,814
Amount of interest received in year	**17,411**	18,001	18,582
Amount of dividends received in year	**30**	106	10
Amount of income taxes paid in year	**736**	1,323	1,286

Note 36 Subsequent events

On November 10, 2016, Moneris Solutions Corporation (Moneris) entered into a definitive agreement to sell its U.S. operations to Vantiv Inc. for US$425 million. The transaction is expected to close in the first quarter of fiscal 2017 and is subject to customary closing conditions, including the receipt of regulatory approvals.

We have a 50% interest in Moneris and account for our interest as a joint venture. Our share of the gain to be recognized by Moneris is currently estimated to be approximately $200 million, based on the exchange rate as at October 31, 2016. This estimate is subject to change.

Ten-year statistical review

Condensed Balance Sheet

	IFRS						CGAAP				
(Millions of Canadian dollars)	**2016**	2015	2014	2013	2012	2011	2011	2010	2009	2008	2007
Assets											
Cash and due from banks	**$ 14,929**	$ 12,452	$ 17,421	$ 15,550	$ 12,428	$ 12,428	$ 13,247	$ 8,440	$ 7,584	$ 11,086	$ 4,226
Interest-bearing deposits with banks	**27,851**	22,690	8,399	9,039	10,246	6,460	12,181	13,254	8,919	20,041	11,881
Securities	**236,093**	215,508	199,148	182,710	161,602	167,022	179,558	183,519	177,298	171,134	178,255
Assets purchased under reverse repurchase agreements and securities borrowed	**186,302**	174,723	135,580	117,517	112,257	84,947	84,947	72,698	41,580	44,818	64,313
Loans net of allowance	**521,604**	472,223	435,229	408,850	378,241	347,530	296,284	273,006	258,395	289,540	237,936
Other	**193,479**	176,612	144,773	126,079	149,180	175,446	165,485	175,289	161,213	187,240	103,735
Total Assets	**$ 1,180,258**	$ 1,074,208	$ 940,550	$ 859,745	$ 823,954	$ 793,833	$ 751,702	$ 726,206	$ 654,989	$ 723,859	$ 600,346
Liabilities											
Deposits	**$ 757,589**	$ 697,227	$ 614,100	$ 563,079	$ 512,244	$ 479,102	$ 444,181	$ 414,561	$ 378,457	$ 438,575	$ 365,205
Other	**341,295**	305,675	264,088	239,763	259,174	263,625	256,124	263,030	229,699	242,744	201,404
Subordinated debentures	**9,762**	7,362	7,859	7,443	7,615	8,749	7,749	6,681	6,461	8,131	6,235
Trust capital securities	**–**	–	–	–	–	894	–	727	1,395	1,400	1,400
Preferred shares liabilities	**–**	–	–	–	–	–	–	–	–	–	300
Non-controlling interest in subsidiaries	**n.a.**	n.a.	n.a.	n.a.	n.a.	n.a.	1,941	2,256	2,071	2,371	1,483
Total Liabilities	**1,108,646**	1,010,264	886,047	810,285	779,033	752,370	709,995	687,255	618,083	693,221	576,027
Equity attributable to shareholders	**71,017**	62,146	52,690	47,665	43,160	39,702	41,707	38,951	36,906	30,638	24,319
Non-controlling interest	**595**	1,798	1,813	1,795	1,761	1,761	n.a.	n.a.	n.a.	n.a.	n.a.
Total equity	**71,612**	63,944	54,503	49,460	44,921	41,463	41,707	38,951	36,906	30,638	24,319
Total liabilities and equity	**$ 1,180,258**	$ 1,074,208	$ 940,550	$ 859,745	$ 823,954	$ 793,833	$ 751,702	$ 726,206	$ 654,989	$ 723,859	$ 600,346

Condensed Income Statement

	IFRS						CGAAP				
(Millions of Canadian dollars)	**2016**	2015	2014	2013	2012	2011	2011	2010	2009	2008	2007
Net interest income	**$16,531**	$14,771	$14,116	$13,249	$12,439	$11,357	$10,600	$10,338	$10,705	$ 9,054	$ 7,700
Non-interest income	**21,874**	20,550	19,992	17,433	16,708	16,281	16,830	15,744	15,736	12,528	14,762
Total revenue	**38,405**	35,321	34,108	30,682	29,147	27,638	27,430	26,082	26,441	21,582	22,462
Provision for credit losses (PCL)	**1,546**	1,097	1,164	1,237	1,299	1,133	975	1,240	2,167	1,595	791
Insurance policyholder benefits, claims and acquisition expense	**3,424**	2,963	3,573	2,784	3,621	3,358	3,360	3,546	3,042	1,631	2,173
Non-interest expense (NIE)	**20,136**	18,638	17,661	16,214	14,641	14,167	14,453	13,469	13,436	12,351	12,473
Non-controlling interest	**n.a.**	n.a.	n.a.	n.a.	n.a.	n.a.	104	99	100	81	141
Net income from continuing operations	**10,458**	10,026	9,004	8,342	7,558	6,970	6,650	5,732	5,681	4,555	5,492
Net loss from discontinued operations	**–**	–	–	–	(51)	(526)	(1,798)	(509)	(1,823)	–	–
Net income	**10,458**	10,026	9,004	8,342	7,507	6,444	4,852	5,223	3,858	4,555	5,492

Other Statistics – reported

(Millions of Canadian dollars, except percentages and per share amounts)	IFRS						CGAAP				
	2016	2015	2014	2013	2012	2011	2011	2010	2009	2008	2007
PROFITABILITY MEASURES (1)											
Earnings per shares (EPS) – basic	**$ 6.80**	$ 6.75	$ 6.03	$ 5.53	$ 4.96	$ 4.25	$ 3.21	$ 3.49	$ 2.59	$ 3.41	$ 4.24
– diluted	**$ 6.78**	$ 6.73	$ 6.00	$ 5.49	$ 4.91	$ 4.19	$ 3.19	$ 3.46	$ 2.57	$ 3.38	$ 4.19
Return on common equity (ROE)	**16.3%**	18.6%	19.0%	19.7%	19.6%	18.7%	12.9%	14.9%	11.9%	18.1%	24.7%
Return on risk-weighted assets (RWA) (2)	**2.34%**	2.45%	2.52%	2.67%	2.70%	2.44%	1.87%	2.03%	1.50%	1.78%	2.23%
Efficiency ratio (1)	**52.4%**	52.8%	51.8%	52.8%	50.2%	51.3%	52.7%	51.6%	50.8%	57.2%	55.5%
KEY RATIOS											
PCL on impaired loans as a % of Average net loans and acceptances	**0.28%**	0.24%	0.27%	0.31%	0.35%	0.33%	0.34%	0.45%	0.72%	0.53%	0.33%
Net interest margin (total average assets)	**1.41%**	1.40%	1.56%	1.56%	1.55%	1.52%	1.49%	1.59%	1.64%	1.39%	1.33%
Non-interest income as a % of total revenue	**57.0%**	58.2%	58.6%	56.8%	57.3%	58.9%	61.4%	60.4%	59.5%	58.0%	65.7%
SHARE INFORMATION (3)											
Common shares outstanding (000s) – end of period	**1,485,394**	1,443,423	1,442,233	1,441,056	1,445,303	1,438,376	1,438,376	1,424,922	1,417,610	1,341,260	1,276,260
Dividends declared per common share	**$ 3.24**	$ 3.08	$ 2.84	$ 2.53	$ 2.28	$ 2.08	$ 2.08	$ 2.00	$ 2.00	$ 2.00	$ 1.82
Dividend yield	**4.3%**	4.1%	3.8%	4.0%	4.5%	3.9%	3.9%	3.6%	4.8%	4.2%	3.3%
Dividend payout ratio	**48%**	46%	47%	46%	46%	45%	47%	52%	52%	59%	43%
Book value per share	**$ 43.32**	$ 39.51	$ 33.69	$ 29.87	$ 26.52	$ 24.25	$ 25.65	$ 23.99	$ 22.67	$ 20.90	$ 17.49
Common share price (RY on TSX) – close, end of period	**$ 83.80**	$ 74.77	$ 80.01	$ 70.02	$ 56.94	$ 48.62	$ 48.62	$ 54.39	$ 54.80	$ 46.84	$ 56.04
Market capitalization (TSX)	**124,476**	107,925	115,393	100,903	82,296	69,934	69,934	77,502	77,685	62,825	71,522
Market price to book value	**1.93**	1.89	2.38	2.34	2.15	2.00	1.90	2.27	2.42	2.24	3.20
CAPITAL MEASURES – CONSOLIDATED (4)											
Common Equity Tier 1 capital ratio	**10.8%**	10.6%	9.9%	9.6%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Tier 1 capital ratio	**12.3%**	12.2%	11.4%	11.7%	13.1%	n.a.	13.3%	13.0%	13.0%	9.0%	9.4%
Total capital ratio	**14.4%**	14.0%	13.4%	14.0%	15.1%	n.a.	15.3%	14.4%	14.2%	11.0%	11.5%
Assets-to-capital multiple	**n.a.**	n.a.	17.0X	16.6X	16.7X	n.a.	16.1X	16.5X	16.3X	20.1X	20.0X
Leverage Ratio	**4.4%**	4.3%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

(1) Ratios for 2009-2012 represent continuing operations.
(2) Return on risk-weighted assets (RWA) for fiscal 2011 is based on RWA reported under CGAAP and Income reported under IFRS.
(3) On April 6, 2006, we paid a stock dividend of one common share on each of our issued and outstanding common shares. The effect was the same as two-for-one split of our common shares. All common share and per share information have been adjusted retroactively for the stock dividend.
(4) Effective 2013 we calculate the capital ratios and multiples using the Basel III (all-in basis) framework unless otherwise stated. 2008-2012 capital ratios and multiples were calculated using the Basel II framework. 2004-2007 capital ratios and 2005-2007 asset-to-capital multiples were calculated using the Basel I framework. Capital ratios and multiples for 2011 were determined under Canadian GAAP.

Glossary

Acceptances
A bill of exchange or negotiable instrument drawn by the borrower for payment at maturity and accepted by a bank. The acceptance constitutes a guarantee of payment by the bank and can be traded in the money market. The bank earns a "stamping fee" for providing this guarantee.

Acquired Credit Impaired (ACI) loans
Loans identified as impaired on the acquisition date based on specific risk characteristics such as indications that the borrower is experiencing significant financial difficulty, probability of bankruptcy or other financial reorganization, payment status and economic conditions that correlate with defaults.

Allowance for credit losses
The amount deemed adequate by management to absorb identified credit losses as well as losses that have been incurred but are not yet identifiable as at the balance sheet date. This allowance is established to cover the lending portfolio including loans, acceptances, guarantees, letters of credit, and unfunded commitments. The allowance is increased by the provision for credit losses, which is charged to income and decreased by the amount of write-offs, net of recoveries in the period.

Alt-A assets
A term used in the U.S. to describe assets (mainly mortgages) with a borrower risk profile between the prime and subprime categorizations. Categorization of assets as Alt-A (as opposed to prime) varies, such as limited verification or documentation of borrowers' income or a limited credit history.

Asset-backed securities (ABS)
Securities created through the securitization of a pool of assets, for example auto loans or credit card loans.

Assets-to-capital multiple (ACM)
Total assets plus specified off-balance sheet items, as defined by OSFI, divided by total regulatory capital on a transitional basis. ACM has been replaced in 2015 by the Basel III Leverage Ratio.

Assets under administration (AUA)
Assets administered by us, which are beneficially owned by clients, as at October 31, unless otherwise noted. Services provided in respect of assets under administration are of an administrative nature, including safekeeping, collecting investment income, settling purchase and sale transactions, and record keeping.

Assets under management (AUM)
Assets managed by us, which are beneficially owned by clients, as at October 31, unless otherwise noted. Services provided in respect of assets under management include the selection of investments and the provision of investment advice. We have assets under management that are also administered by us and included in assets under administration.

Auction rate securities (ARS)
Securities issued through structured entities that hold long-term assets funded with long-term debt. In the U.S., these securities are issued by sponsors such as municipalities, student loan authorities or other sponsors through bank-managed auctions.

Average earning assets
Average earning assets include interest-bearing deposits with other banks including certain components of cash and due from banks, securities, assets purchased under reverse repurchase agreements and securities borrowed, loans, and excludes segregated fund net assets and other assets. The averages are based on the daily balances for the period.

Bank-owned life insurance contracts (BOLI)
Our legacy portfolio includes BOLI where we provided banks with BOLI stable value agreements ("wraps"), which insure the life insurance policy's cash surrender value from market fluctuations on the underlying investments, thereby allowing us to guarantee a minimum tax-exempt return to the counterparty. These wraps allow us to account for the underlying assets on an accrual basis instead of a mark-to-market basis.

Basis point (bp)
One one-hundredth of a percentage point (.01%).

Collateral
Assets pledged as security for a loan or other obligation. Collateral can take many forms, such as cash, highly rated securities, property, inventory, equipment and receivables.

Collateralized debt obligation (CDO)
Securities with multiple tranches that are issued by structured entities and collateralized by debt obligations including bonds and loans. Each tranche offers a varying degree of risk and return so as to meet investor demand.

Commercial mortgage-backed securities (CMBS)
Securities created through the securitization of commercial mortgages.

Commitments to extend credit
Unutilized amount of credit facilities available to clients either in the form of loans, bankers' acceptances and other on-balance sheet financing, or through off-balance sheet products such as guarantees and letters of credit.

Common Equity Tier 1 (CET1) capital
A regulatory Basel III capital measure comprised mainly of common shareholders' equity less regulatory deductions and adjustments for goodwill and intangibles, defined benefit pension fund assets, shortfall in allowances and other specified items.

Common Equity Tier 1 capital ratio
A risk-based capital measure calculated as CET1 capital divided by risk-weighted assets.

Covered bonds
Full recourse on-balance sheet obligations issued by banks and credit institutions that are also fully collateralized by assets over which investors enjoy a priority claim in the event of an issuer's insolvency.

Credit default swaps (CDS)
A derivative contract that provides the purchaser with a one-time payment should the referenced entity/entities default (or a similar triggering event occur).

Derivative
A contract between two parties, which requires little or no initial investment and where payments between the parties are dependent upon the movements in price of an underlying instrument, index or financial rate. Examples of derivatives include swaps, options, forward rate agreements and futures. The notional amount of the derivative is the contract amount used as a reference point to calculate the payments to be exchanged between the two parties, and the notional amount itself is generally not exchanged by the parties.

Dividend payout ratio
Common dividends as a percentage of net income available to common shareholders.

Earnings per share (EPS), basic
Calculated as net income available to common shareholders divided by the average number of shares outstanding.

Earnings per share (EPS), diluted
Calculated as net income available to common shareholders divided by the average number of shares outstanding adjusted for the dilutive effects of stock options and other convertible securities.

Economic 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. The identified risks for which we calculate Economic Capital are credit, market (trading and non-trading), operational, business, fixed asset, and insurance. Additionally, Economic Capital includes goodwill and intangibles, and allows for diversification benefits across risks and business segments.

Expected credit losses
The difference between the contractual cash flows due to us in accordance with the relevant contractual terms and the cash flows that we expect to receive, discounted to the balance sheet date.

Fair value
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.

Federal Deposit Insurance Corporation (FDIC)
An independent U.S. government agency that aims to preserve and promote public confidence in the U.S. financial system by insuring deposits in banks and thrift institutions; identifying, monitoring and addressing risks to these deposits; and limiting the effect on the economic and financial system when a bank or thrift institution fails.

Funding Valuation Adjustment
Funding valuation adjustments are calculated to incorporate cost and benefit of funding in the valuation of uncollateralized and under-collateralized OTC derivatives. Future expected cash flows of these derivatives are discounted to reflect the cost and benefit of funding the derivatives by using a funding curve, implied volatilities and correlations as inputs.

Gross-adjusted assets (GAA)
GAA are used in the calculation of the Assets-to-Capital multiple. They represent our total assets including specified off-balance sheet items and net of prescribed deductions. Off balance sheet items for this calculation are direct credit substitutes, including letters of credit and guarantees, transaction-related contingencies, trade-related contingencies and sale and repurchase agreements. Commencing Q1/15, the Asset-to-capital multiple and GAA have been replaced with the leverage ratio and leverage ratio exposure respectively.

Guarantees and standby letters of credit
These primarily represent irrevocable assurances that a bank will make payments in the event that its client cannot meet its financial obligations to third parties. Certain other guarantees, such as bid and performance bonds, represent non-financial undertakings.

Hedge
A risk management technique used to mitigate exposure from market, interest rate or foreign currency exchange risk arising from normal banking operations. The elimination or reduction of such exposure is accomplished by establishing offsetting positions. For example, assets denominated in foreign currencies can be offset with liabilities in the same currencies or through the use of foreign exchange hedging instruments such as futures, options or foreign exchange contracts.

Hedge funds
A type of investment fund, marketed to accredited high net worth investors, that is subject to limited regulation and restrictions on its investments compared to retail mutual funds, and that often utilize aggressive strategies such as selling short, leverage, program trading, swaps, arbitrage and derivatives.

High-quality liquid assets (HQLA)
Assets are considered to be HQLA if they can be easily and immediately converted into cash at little or no loss of value during a time of stress.

Home equity products
This is comprised of residential mortgages and secured personal loans whereby the borrower pledges real estate as collateral.

International Financial Reporting Standards (IFRS)
IFRS are principles-based standards, interpretations and the framework adopted by the International Accounting Standards Board.

Impaired loans
Loans are classified as impaired when there has been a deterioration of credit quality to the extent that management no longer has reasonable assurance of timely collection of the full amount of principal and interest in accordance with the contractual terms of the loan agreement. Credit card balances are not classified as impaired as they are directly written off after payments are 180 days past due.

Innovative capital instruments
Innovative capital instruments are capital instruments issued by structured entities, whose primary purpose is to raise capital. We previously issued innovative capital instruments, RBC Trust Capital Securities (RBC TruCS) and RBC Trust Subordinated Notes (RBC TSNs), through three structured entities: RBC Capital Trust, RBC Capital Trust II and RBC Subordinated Notes Trust. As per OSFI Basel III guidelines, non-qualifying innovative capital instruments treated as additional Tier 1 capital are subject to phase out over a ten year period beginning on January 1, 2013.

Leverage Ratio
A Basel III regulatory measure, the ratio divides Tier 1 capital by the sum of total assets plus specified off-balance sheet items.

Liquidity Coverage Ratio (LCR)
The Liquidity Coverage Ratio is a Basel III metric that measures the sufficiency of HQLA available to meet net short-term financial obligations over a thirty day period in an acute stress scenario.

Loan-to-value (LTV) ratio
Calculated based on the total facility amount for the residential mortgage and homeline product divided by the value of the related residential property.

Master netting agreement
An agreement between us and a counterparty designed to reduce the credit risk of multiple derivative transactions through the creation of a legal right of offset of exposure in the event of a default.

Net interest income
The difference between what is earned on assets such as loans and securities and what is paid on liabilities such as deposits and subordinated debentures.

Net interest margin (average assets)
Net interest income as a percentage of total average assets.

Net interest margin (on average earning assets)
Calculated as net interest income divided by average earning assets.

Normal course issuer bid (NCIB)
A program for the repurchase of our own shares for cancellation through a stock exchange that is subject to the various rules of the relevant stock exchange and securities commission.

Notional amount
The contract amount used as a reference point to calculate payments for derivatives.

Off-balance sheet financial instruments
A variety of arrangements offered to clients, which include credit derivatives, written put options, backstop liquidity facilities, stable value products, financial standby letters of credit, performance guarantees, credit enhancements, mortgage loans sold with recourse, commitments to extend credit, securities lending, documentary and commercial letters of credit, note issuances and revolving underwriting facilities, securities lending indemnifications and indemnifications.

Office of the Superintendent of Financial Institutions Canada (OSFI)
The primary regulator of federally chartered financial institutions and federally administered pension plans in Canada. OSFI's mission is to safeguard policyholders, depositors and pension plan members from undue loss.

Operating leverage
The difference between our revenue growth rate and non-interest expense growth rate.

Options
A contract or a provision of a contract that gives one party (the option holder) the right, but not the obligation, to perform a specified transaction with another party (the option issuer or option writer) according to specified terms.

Primary dealer
A formal designation provided to a bank or securities broker-dealer permitted to trade directly with a country's central bank. Primary dealers participate in open market operations, act as market-makers of government debt and provide market information and analysis to assist with monetary policy.

Provision for credit losses (PCL)
The amount charged to income necessary to bring the allowance for credit losses to a level determined appropriate by management. This includes both provisions on impaired loans and loans not yet identified as impaired.

Repurchase agreements
These involve the sale of securities for cash and the simultaneous repurchase of the securities for value at a later date. These transactions normally do not constitute economic sales and therefore are treated as collateralized financing transactions.

Residential mortgage-backed securities (RMBS)
Securities created through the securitization of residential mortgage loans.

Return on common equity (ROE)
Net income available to common shareholders, expressed as a percentage of average common equity.

Reverse repurchase agreements
These involve the purchase of securities for cash and the simultaneous sale of the securities for value at a later date. These transactions normally do not constitute economic sales and therefore are treated as collateralized financing transactions.

Risk-weighted assets (RWA)
Assets adjusted by a regulatory risk-weight factor to reflect the riskiness of on and off-balance sheet exposures. Certain assets are not risk-weighted, but deducted from capital. The calculation is defined by guidelines issued by OSFI. For more details, refer to the Capital management section.

Securities lending
Transactions in which the owner of a security agrees to lend it under the terms of a prearranged contract to a borrower for a fee. The borrower must collateralize the security loan at all times. An intermediary such as a bank often acts as agent for the owner of the security. There are two types of securities lending arrangements: lending with and without credit or market risk indemnification. In securities lending without indemnification, the bank bears no risk of loss. For transactions in which the bank provides an indemnification, it bears the risk of loss if the borrower defaults and the value of the collateral declines concurrently.

Securities sold short
A transaction in which the seller sells securities and then borrows the securities in order to deliver them to the purchaser upon settlement. At a later date, the seller buys identical securities in the market to replace the borrowed securities.

Securitization
The process by which various financial assets are packaged into newly issued securities backed by these assets.

Structured entities
A structured entity is an entity in which voting or similar rights are not the dominant factor in deciding who controls the entity, such as when the activities that significantly affect the entity's returns are directed by means of contractual arrangements. Structured entities often have restricted activities, narrow and well defined objectives, insufficient equity to finance their activities, and financing in the form of multiple contractually-linked instruments.

Standardized Approach
Risk weights prescribed by OSFI are used to calculate risk-weighted assets for the credit risk exposures. Credit assessments by OSFI-recognized external credit rating agencies of S&P, Moody's, Fitch and DBRS are used to risk-weight our Sovereign and Bank exposures based on the standards and guidelines issued by OSFI. For our Business and Retail exposures, we use the standard risk weights prescribed by OSFI.

Structured investment vehicle
Managed investment vehicle that holds mainly highly rated asset-backed securities and funds itself using the short-term commercial paper market as well as the medium-term note (MTN) market.

Subprime loans
Subprime lending is the practice of making loans to borrowers who do not qualify for the best market interest rates because of their deficient credit history. Subprime lending carries more risk for lenders due to the combination of higher interest rates for the borrowers, poorer credit histories, and adverse financial situations usually associated with subprime applicants.

Taxable equivalent basis (teb)
Income from certain specified tax advantaged sources (eligible Canadian taxable corporate dividends) is increased to a level that would make it comparable to income from taxable sources. There is an offsetting adjustment in the tax provision, thereby generating the same after-tax net income.

Tier 1 capital
Tier 1 capital comprises predominantly of CET1 capital, with additional Tier 1 items such as preferred shares, innovative instruments and non-controlling interests in subsidiaries Tier 1 instruments.

Tier 2 capital
Tier 2 capital consists mainly of subordinated debentures that meet certain criteria, certain loan loss allowances and non-controlling interests in subsidiaries' Tier 2 instruments.

Total capital and total capital ratio
Total capital is defined as the total of Tier 1 and Tier 2 capital. The total capital ratio is calculated by dividing total capital by risk-weighted assets.

Tranche
A security class created whereby the risks and returns associated with a pool of assets are packaged into several classes of securities offering different risk and return profiles from those of the underlying asset pool. Tranches are typically rated by ratings agencies, and reflect both the credit quality of underlying collateral as well as the level of protection based on the tranches' relative subordination.

Trust Capital Securities (RBC TruCS)
Transferable trust units issued by structured entities RBC Capital Trust or RBC Capital Trust II for the purpose of raising innovative Tier 1 capital.

Value-at-Risk (VaR)
A generally accepted risk-measurement concept that uses statistical models based on historical information to estimate within a given level of confidence the maximum loss in market value we would experience in our trading portfolio from an adverse one-day movement in market rates and prices.

Directors and executive officers

Directors

W. Geoffrey Beattie (2001)
Toronto, Ontario
Chief Executive Officer
Generation Capital

Andrew A. Chisholm (2016)
Toronto, Ontario
Corporate Director

Jacynthe Côté (2014)
Montreal, Quebec
Corporate Director

Toos N. Daruvala (2015)
New York, New York
Senior Advisor and Director Emeritus
McKinsey & Company

David F. Denison, O.C., FCPA, FCA (2012)
Toronto, Ontario
Corporate Director

Richard L. George, O.C. (2012)
Calgary, Alberta
Partner, Novo Investment Group

Alice D. Laberge (2005)
Vancouver, British Columbia
Corporate Director

Michael H. McCain (2005)
Toronto, Ontario
President and Chief
Executive Officer
Maple Leaf Foods Inc.

David I. McKay (2014)
Toronto, Ontario
President and Chief
Executive Officer
Royal Bank of Canada

Heather Munroe-Blum, O.C., O.Q.,
Ph.D., FRSC (2011)
Montreal, Quebec
Professor Emerita and Principal Emerita
McGill University

Thomas A. Renyi (2013)
New Harbor, Maine
Corporate Director

Edward Sonshine, O.Ont., Q.C. (2008)
Toronto, Ontario
Chief Executive Officer
RioCan Real Estate
Investment Trust

Kathleen P. Taylor (2001)
Toronto, Ontario
Chair of the Board
Royal Bank of Canada

Bridget A. van Kralingen (2011)
New York, New York
Senior Vice President
Industry Platforms
IBM Corporation

Thierry Vandal (2015)
New York, New York
President
Axium Infrastructure US Inc.

The date appearing after the name of each director indicates the year in which the individual became a director.

Group Executive

Mike Dobbins[1]
Head, Strategy and Corporate Development

Janice R. Fukakusa, FCPA, FCA[2]
Chief Administrative Officer and Chief Financial Officer

Doug Guzman
Group Head, Wealth Management and Insurance

Zabeen Hirji
Chief Human Resources Officer

Mark Hughes
Group Chief Risk Officer

A. Douglas McGregor
Group Head, Capital Markets
and Investor & Treasury Services

David I. McKay
President and
Chief Executive Officer

Bruce Ross
Group Head, Technology & Operations

Jennifer Tory
Group Head,
Personal & Commercial Banking

(1) Effective November 1, 2016, Mike Dobbins was appointed Head, Strategy and Corporate Development and joined Group Executive.
(2) Janice R. Fukakusa will retire as Chief Administrative Officer and Chief Financial Officer on January 31, 2017. Rod Bolger will take over as Chief Financial Officer effective December 1, 2016 and will join Group Executive on January 31, 2017.

Principal subsidiaries

Principal subsidiaries (1)	Principal office address (2)	Carrying value of voting shares owned by the Bank (3)
Royal Bank Holding Inc.	Toronto, Ontario, Canada	$ 52,178
Royal Mutual Funds Inc.	Toronto, Ontario, Canada	
RBC Insurance Holdings Inc.	Mississauga, Ontario, Canada	
RBC Insurance Company of Canada	Mississauga, Ontario, Canada	
RBC Life Insurance Company	Mississauga, Ontario, Canada	
RBC Direct Investing Inc.	Toronto, Ontario, Canada	
RBC Phillips, Hager & North Investment Counsel Inc.	Toronto, Ontario, Canada	
R.B.C. Holdings (Bahamas) Limited	Nassau, New Providence, Bahamas	
RBC Caribbean Investments Limited	George Town, Grand Cayman, Cayman Islands	
Royal Bank of Canada Insurance Company Ltd.	St. Michael, Barbados	
Investment Holdings (Cayman) Limited	George Town, Grand Cayman, Cayman Islands	
RBC (Barbados) Funding Ltd.	St. Michael, Barbados	
Capital Funding Alberta Limited	Calgary, Alberta, Canada	
RBC Global Asset Management Inc.	Toronto, Ontario, Canada	
RBC Investor Services Trust	Toronto, Ontario, Canada	
RBC Investor Services Bank S.A.	Esch-sur-Alzette, Luxembourg	
RBC (Barbados) Trading Bank Corporation	St. James, Barbados	
BlueBay Asset Management (Services) Ltd	London, England	
RBC USA Holdco Corporation (2)	New York, New York, U.S.	18,771
RBC Capital Markets, LLC (2)	New York, New York, U.S.	
RBC Bank (Georgia), National Association (2)	Atlanta, Georgia, U.S.	
City National Bank	Los Angeles, California, U.S.	
RBC Global Asset Management (U.S.) Inc.	Minneapolis, Minnesota, U.S.	
RBC Dominion Securities Limited	Toronto, Ontario, Canada	7,926
RBC Dominion Securities Inc.	Toronto, Ontario, Canada	
RBC Holdings (Barbados) Ltd.	St. Michael, Barbados	3,556
RBC Financial (Caribbean) Limited	Port of Spain, Trinidad and Tobago	
RBC Finance S.à r.l./B.V. (2)	Amsterdam, Netherlands	3,205
RBC Holdings (Luxembourg) S.A R.L.	Luxembourg, Luxembourg	
RBC Holdings (Channel Islands) Limited	Jersey, Channel Islands	
Royal Bank of Canada (Channel Islands) Limited	Guernsey, Channel Islands	
RBC Capital Trust	Toronto, Ontario, Canada	1,633
RBC Europe Limited	London, England	1,593
Royal Bank Mortgage Corporation	Toronto, Ontario, Canada	1,118
The Royal Trust Company	Montreal, Quebec, Canada	619
Royal Trust Corporation of Canada	Toronto, Ontario, Canada	255
RBC Covered Bond Guarantor Limited Partnership	Toronto, Ontario, Canada	166

(1) The Bank directly or indirectly controls each subsidiary.

(2) Each subsidiary is incorporated or organized under the law of the state or country in which the principal office is situated, except for RBC USA Holdco Corporation which is incorporated under the laws of the State of Delaware, U.S., RBC Capital Markets, LLC, which is organized under the laws of the State of Minnesota, U.S. RBC Finance S.à r.l. / B.V. is a company incorporated in the Netherlands with its official seat in Amsterdam, the Netherlands, and place of effective management, central administration, and principal establishment in Luxembourg, Grand Duchy of Luxembourg. RBC Bank (Georgia), National Association is a national banking association organized under the laws of the U.S. with its main office in Atlanta, Georgia and management offices in Raleigh, North Carolina.

(3) The carrying value (in millions of Canadian dollars) of voting shares is stated as the Bank's equity in such investments.

Shareholder Information

Corporate headquarters
Street address:
Royal Bank of Canada
200 Bay Street
Toronto, Ontario M5J 2J5
Canada
Tel: 1-888-212-5533

Mailing address:
P.O. Box 1
Royal Bank Plaza
Toronto, Ontario M5J 2J5
Canada
website: rbc.com

Transfer Agent and Registrar
Main Agent:
Computershare Trust
Company of Canada
1500 Robert-Bourassa Blvd.
Suite 700
Montreal, Quebec H3A 3S8
Canada
Tel: 1-866-586-7635 (Canada and the U.S.) or 514-982-7555 (International)
Fax: 514-982-7580
website: computershare.com/rbc

Co-Transfer Agent (U.S.):
Computershare Trust
Company, N.A.
250 Royall Street
Canton, Massachusetts 02021
U.S.A.

Co-Transfer Agent (U.K.):
Computershare Investor
Services PLC
Securities Services – Registrars
P.O. Box 82, The Pavilions,
Bridgwater Road,
Bristol BS99 6ZZ
U.K.

Stock exchange listings
(Symbol: RY)

Common shares are listed on:
Canada – Toronto Stock
Exchange (TSX)
U.S. – New York Stock Exchange
(NYSE)
Switzerland – Swiss Exchange
(SIX)

All preferred shares are listed on the TSX with the exception of the series C-1 and C-2. The related depository shares of the series C-1 and C-2 preferred shares are listed on the NYSE.

Valuation day price
For Canadian income tax purposes, Royal Bank of Canada's common stock was quoted at $29.52 per share on the Valuation Day (December 22, 1971). This is equivalent to $7.38 per share after adjusting for the two-for-one stock split of March 1981 and the two-for-one stock split of February 1990. The one-for-one stock dividends in October 2000 and April 2006 did not affect the Valuation Day amount for our common shares.

Shareholder contacts
For dividend information, change in share registration or address, lost stock certificates, tax forms, estate transfers or dividend reinvestment, please contact:
Computershare Trust Company of Canada
100 University Avenue, 8th Floor
Toronto, Ontario M5J 2Y1
Canada

Tel: 1-866-586-7635 (Canada and the U.S.) or 514-982-7555
(International)
Fax: 1-888-453-0330 (Canada and the U.S.) or 416-263-9394
(International)
email: service@computershare.com

For other shareholder inquiries, please contact:
Shareholder Relations
Royal Bank of Canada
200 Bay Street
South Tower
Toronto, Ontario M5J 2J5
Canada
Tel: 416-955-7806

Financial analysts, portfolio managers, institutional investors
For financial information inquiries, please contact:
Investor Relations
Royal Bank of Canada
200 Bay Street
North Tower
Toronto, Ontario M5J 2W7
Canada
Tel: 416-955-7802

or visit our website at
rbc.com/investorrelations

Direct deposit service
Shareholders in Canada and the U.S. may have their RBC common share dividends deposited directly to their bank account by electronic funds transfer. To arrange for this service, please contact our Transfer Agent and Registrar, Computershare Trust Company of Canada.

Eligible dividend designation
For purposes of the Income Tax Act (Canada) and any corresponding provincial and territorial tax legislation, all dividends (and deemed dividends) paid by RBC to Canadian residents on both its common and preferred shares, are designated as "eligible dividends," unless stated otherwise.

Common share repurchases
We are engaged in a Normal Course Issuer Bid (NCIB). During the one-year period commencing June 1, 2016, we may repurchase for cancellation, up to 20 million common shares in the open market at market prices. We determine the amount and timing of the purchases under the NCIB, subject to prior consultation with the Office of the Superintendent of Financial Institutions Canada (OSFI).

A copy of our Notice of Intention to file a NCIB may be obtained, without charge, by contacting our Corporate Secretary at our Toronto mailing address.

2017 Quarterly earnings release dates

First quarter	February 24
Second quarter	May 25
Third quarter	August 23
Fourth quarter	November 29

2017 Annual Meeting
The Annual Meeting of Common Shareholders will be held on Thursday, April 6, 2017, at 9:30 a.m. (Eastern Time), at the Sony Centre for the Performing Arts, 1 Front Street East, Toronto, Ontario, Canada.

Information contained in or otherwise accessible through the websites mentioned in this report to shareholders does not form a part of this report. All references to websites are inactive textual references and are for your information only.

Trademarks used in this report include the LION & GLOBE Symbol, ROYAL BANK OF CANADA, RBC, RBC CAPITAL MARKETS, RBC CAPITAL TRUST, RBC GLOBAL ASSET MANAGEMENT, RBC INSURANCE, RBC REWARDS, RBC SUBORDINATED NOTES TRUST, RBC TSNs, RBC TruCS, RBC WEALTH MANAGEMENT, DIGITALLY ENABLED RELATIONSHIP BANK, ROYAL CREDIT LINE, YOURTERM which are trademarks of Royal Bank of Canada used by Royal Bank of Canada and/or by its subsidiaries under license. VISA is a registered trademark of Visa International Service Association. All other trademarks mentioned in this report, including those that are identified with the ‡ symbol, which are not the property of Royal Bank of Canada, are owned by their respective holders.

Dividend dates for 2017
Subject to approval by the Board of Directors

	Ex-dividend dates	Record dates	Payment dates
Common and preferred shares series W, AA, AB, AC, AD, AE, AF, AG, AJ, AK, AL, AZ, BB, BD, BF, BH, BI, BJ, BK and BM	January 24	January 26	February 24
	April 21	April 25	May 24
	July 24	July 26	August 24
	October 24	October 26	November 24
Preferred shares series C-1 (US$)	February 1	February 5	February 13
	May 3	May 5	May 15
	August 2	August 4	August 14
	November 1	November 3	November 13
Preferred shares series C-2 (US$)	January 25	January 27	February 7
	April 26	April 28	May 8
	July 26	July 28	August 7
	October 25	October 27	November 7

Governance
Summaries of the significant ways in which corporate governance practices followed by RBC differ from corporate governance practices required to be followed by U.S. domestic companies under the NYSE and Nasdaq listing standards are available on our website at rbc.com/governance.

Exhibit 3.1

Consent of Independent Registered Public Accounting Firm

We hereby consent to the use in this Annual Report on Form 40-F for the year ended October 31, 2016 of Royal Bank of Canada of our report dated November 29, 2016, relating to the consolidated financial statements, and the effectiveness of internal control over financial reporting, which appears in the Exhibit incorporated by reference in this Annual Report.

We also consent to the incorporation by reference in Registration Statements Nos. 333-12036, 333-12050, 333-13052, 333-13112, 333-14144, 333-110953, 333-117922, 333-178350, 333-207754, 333-207750, 333-207748, 333-211680 on Form S-8, and Nos. 333-203567, 333-208507 on Form F-3 of Royal Bank of Canada of our report dated November 29, 2016 referred to above. We also consent to reference to us under the heading “Experts”, which appears in the Annual Information Form included in the Exhibit incorporated by reference in this Annual Report on Form 40-F.

/s/ PricewaterhouseCoopers LLP

Chartered Professional Accountants, Licensed Public Accountants
Toronto, Canada
November 30, 2016

Exhibit 3.2

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in Registration Statement Nos. 333-12036, 333-12050, 333-13052, 333-13112, 333-14144, 333-110953, 333-117922, 333-178350, 333-207754, 333-207750, 333-207748 and 333-211680 on Form S-8, Nos. 333-203567 and 333-208507 on Form F-3 of our reports dated December 1, 2015 relating to the consolidated financial statements of Royal Bank of Canada for the two-year periods ended October 31, 2015 appearing in this Annual Report on Form 40-F of Royal Bank of Canada for the year ended October 31, 2016.

Yours very truly,

/s/ Deloitte LLP

Chartered Professional Accountants
Licensed Public Accountants
Toronto, Canada
November 30, 2016

RBC Code of Conduct

A message from Dave McKay
President and CEO

Building Trust - RBC and You

Why do banks matter? They facilitate personal and business financial transactions, match saving and borrowing needs, and help domestic and international markets function. They provide financial advice, help manage risks and are vital for economic growth. Banks hold this important position in our society because of the trust others place in them. It's crucial that clients, employees, investors, communities, and regulators have confidence that banks act fairly and ethically.

At RBC, we hold ourselves to the highest standards of integrity to build trust with every interaction. By listening to clients and communities to understand their interests and needs, we reinforce the trust that is so important to our success and to our Vision – *To be among the world's most trusted and successful financial institutions*. Our Values, especially our Value of Integrity, and Code of Conduct guide us and set expectations for ethical behaviour and decision-making. They help us decide how we serve our clients and deal with each other with respect, transparency and fairness.

Our Code protects employees, clients and RBC by providing a common understanding of what's acceptable and what's not. It's a resource that helps us understand what's expected and why.

We are all responsible for protecting and enhancing RBC's reputation by following our Code of Conduct. It's also important that we support one another in doing what's right, by speaking up candidly and challenging situations we believe are wrong.

Please read the Code carefully, discuss what it means with your manager and colleagues, and ask questions to ensure you understand it and what it requires of you.

You represent RBC both on and off the job. You keep RBC a leader in a changing world by relying on enduring beliefs – our Values of client first, collaboration, accountability, diversity and inclusion and integrity, and you bring to life our purpose of helping clients thrive and communities prosper. Great workplaces simply don't exist without great people. It all starts with you.

Dave McKay, President and CEO

Our Vision and Values

RBC's Values define what we stand for everywhere we do business. They are reflected in our behaviour and the way we build relationships and deliver value to all our stakeholders — clients, employees, shareholders, communities and others we deal with. Guided by our shared Values and united in a common purpose, we can achieve our strategic goals and accomplish great results. We demonstrate our Vision – **To be Among the World's Most Trusted and Successful Financial Institutions** - by living our Values in the decisions and actions we take every day. These five Values set the tone for our culture and unify us across geographies and businesses:

CLIENT FIRST: **We will always earn the right to be our clients' first choice.**

- Put client needs above our own whatever our role, to build lasting relationships
- Listen with empathy, understand client needs to offer the right advice and solutions
- Bring the best of RBC to deliver excellent value and differentiated client experiences

COLLABORATION: **We win as One RBC.**

- Believe in each other and trust in teamwork and colleagues' intentions
- Share knowledge, listen, and teach to learn and achieve more together
- Look beyond ourselves to see the bigger picture for opportunities and solutions

ACCOUNTABILITY: **We take ownership for personal and collective high performance.**

- Be bolder, reach higher, act with courage to realize potential and make a difference
- Own it; seek out accountability and empowerment to grow and excel
- Be curious and learn continuously to build skills and careers

DIVERSITY & INCLUSION: **We embrace diversity for innovation and growth.**

- Speak up for inclusion and empower people to grow and achieve more
- Seek out and respect different perspectives to challenge conventional approaches
- Identify and act on the opportunities and needs that client diversity brings

INTEGRITY: **We hold ourselves to the highest standards to build trust.**

- Be respectful, transparent and fair in all relationships
- Stand up for what we believe; speak with candour; constructively challenge
- Build trust of clients, colleagues and community partners by listening to and understanding their interests and needs

At RBC we bring these Values to life every day — continuing to earn the trust of RBC's clients and ensuring our strong reputation for doing what's right.

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Publication date: January 1, 2016

1. Our Culture of Integrity

1.1 Living Our Values and Acting with Integrity

RBC is a values-based organization. Respect for each other, RBC clients and our commitments to all our stakeholders are rooted in our Values. RBC's Code of Conduct (the "Code") incorporates RBC's Values, and in particular our Value of Integrity, to guide our day-to-day actions and decisions so we can always do the right thing.

Throughout the Code, "RBC" means Royal Bank of Canada and all its subsidiaries and affiliates.

1.2 Our Culture of Integrity — Doing What's Right

Every day our actions demonstrate not only our Value of always earning the right to be our clients' first choice, but also our personal commitments. We each have a responsibility to be truthful, respect others, and comply with laws, regulations and RBC's policies. (In the Code, the word "policy" includes policies, procedures and standards.) Over many years RBC has earned trust and a reputation for doing what's right through the actions of those who work here. A continued strong focus on doing what's right will sustain and build on that trust — the cornerstone of the financial services industry and our relationships with clients and communities.

We do business across the globe, and each one of us has a responsibility to behave with integrity so that we can continue to serve clients and generate value for RBC's shareholders. More than simply being aware of our Values and following our Code, we need to make them an integral part of how we operate day to day. This will ensure we tell the truth, respect others, uphold the law, speak up to challenge what we believe is wrong, and comply with policies and practices. These behaviours are the foundation for our culture of integrity and doing what's right.

Tell the truth

Our work places us in a position of trust. RBC clients, shareholders, communities and our colleagues rely on us to be honest and do business responsibly. We do what we say we will do and earn the trust and loyalty of our clients, shareholders and communities.

Respect others and treat them fairly

Showing respect for everyone we work with, treating them fairly and taking personal responsibility for high performance enable us to achieve RBC's strategic goals. By living our Values and following the Code, we show others we honour the trust they place in us — making RBC a great place to work and do business.

Uphold the law

RBC is subject to the laws of the countries where we do business. RBC's policies are designed to comply with its legal and regulatory obligations, including the intent and spirit of the laws that apply to it. By doing so, RBC maintains its reputation for acting with integrity. To this end, each of us must understand and comply with RBC's policies and practices that apply to the way we do our jobs. Keep in mind that

breaking the law could result in civil and criminal penalties and fines for RBC and the individual involved, as well as potential damage to both RBC's and the individual's reputation.

Speak up to challenge what we believe is wrong
Constructively challenging decisions and behaviour that we believe are wrong helps ensure we continue to live our Values in our work at RBC. And seeking out constructive challenge when we make business decisions helps ensure those decisions are right for RBC – and clients, colleagues, shareholders and communities.

Comply with policies and instructions
We are each responsible for knowing and following the RBC policies that apply to us. We must also comply with managers' instructions unless they are inconsistent with RBC Values or policies, against the law or result in health and safety risks. In these circumstances, or if we are unsure about the right thing to do, we should raise our concerns with one of the Key Contacts.

We must always be aware of both enterprise and local policies specific to business or geographic areas and work within the boundaries of what we have been authorized to do.

1.3 Our Shared Commitment and Accountability

The Code applies to all RBC employees, contract workers and members of the boards of directors.

The importance of the Code cannot be overemphasized. Understanding and complying with the Code is a condition of our work at RBC, and critical to earning the trust RBC clients and communities have placed in us. This Code helps to protect our personal integrity and reputation as well as RBC's and the financial services industry's as a whole.

Any one of us who breaches, or fails to report an actual or suspected breach of the Code will be subject to corrective or disciplinary action. Corrective or disciplinary action is RBC's response to unacceptable behaviour, including breach of the Code, and can range from reprimands to termination of our working relationship with RBC.

We also expect RBC suppliers to follow similar principles and share our commitment to ethics and integrity as set out in our Supplier Code of Conduct. We will not knowingly use suppliers or other third parties who violate the law or operate unethically.

Approval of the Code
The RBC Board of Directors approves the Code.

Waivers
Waivers of the Code, or any of its provisions, are seldom considered. If a waiver is necessary to accommodate exceptional circumstances, it must be approved by RBC's Chief Human Resources Officer and RBC's Chief Compliance Officer. A waiver of the Code for Royal Bank of Canada directors or specified executive officers must be approved by Royal Bank of Canada's Board of Directors. Approved waivers must be disclosed publicly as required by law and RBC policies.

2. Speaking Up, Raising Concerns and Reporting Misconduct

Our shared commitment and accountability involve more than just personally complying with the Code and acting with integrity.
At RBC, we have a responsibility to seek guidance and raise concerns about compliance with the Code, RBC policies and the law, and a duty to report misconduct. If we need guidance, have questions or are unsure about the right thing to do, we should speak with our manager, senior management or one of the Key Contacts.

When deciding whether to speak up and raise concerns, we should ask ourselves these questions:

- ¡ Is this legal?
- ¡ Is this fair and ethical?
- ¡ How would RBC clients, our colleagues or third parties view this situation?
- ¡ Would RBC's reputation be damaged if this situation became public knowledge?

2.1 Speaking Up and Raising Concerns

We ensure that all questions and concerns raised are addressed. While the Code and RBC policies outline the ethical behaviour expected of us, they cannot anticipate every situation we encounter. By speaking up and raising our concerns, we ensure RBC does the right thing and we protect our clients' interests and assets, and RBC's reputation.

2.2 Reporting Misconduct

We have a duty to report actual or suspected misconduct. This includes violations of the Code, policies and the law. We must promptly notify our manager, senior management or any of the Key Contacts if we:

- are asked to commit or believe we have witnessed a potentially illegal or unethical act, or
- become aware of a breach of the Code or any other situation that could put RBC at risk of loss or harm.

All reports are investigated promptly and thoroughly, as appropriate. RBC keeps these reports confidential, and a report of misconduct or information is disclosed only to the extent necessary to investigate and address the situation.

Refer to RBC's Standard on Reporting Misconduct for further details.

Some examples of misconduct are:

- ¡ deliberate failure to comply with policies, management instructions or the law
- ¡ disrespectful behaviour, harassment, and actual or threatened violence

¡ misappropriation (including theft and kiting), improper use of company or client assets or systems, and improper sales reporting
¡ inappropriate client referrals, failing to report unusual client transactions and inappropriate use or disclosure of client information
¡ inappropriate social media use

2.3 Investigations, Inquiries and Reviews

Each of us has a duty to cooperate with internal or external investigations, inquiries, or reviews of concerns or alleged misconduct in a forthright manner. In these situations, we must provide honest, accurate, complete and timely information.

2.4 RBC's Commitment to Non-Retaliation

There will be no retaliation for speaking up and making a truthful report of actual or suspected misconduct, for participating in an investigation, or for exercising our legal rights. Retaliatory acts can include adverse compensation or workplace consequences such as negative performance evaluations, creating a hostile work environment, harassment, demotion, dismissal or giving someone tasks intended to alienate or discourage him or her. If you believe you've encountered any form of retaliation, follow the reporting procedures set out in the Respectful Workplace Policy to ensure the situation is addressed promptly.

Our commitment to non-retaliation means RBC:

¡ investigates every claim of retaliation
¡ follows up with employees who raise concerns
¡ provides education and coaching on retaliation to managers of employees who raise concerns, and
¡ takes disciplinary action to address retaliation.

Some examples of activity that is not retaliation :

¡ disciplinary action for misconduct
¡ performance management, and
¡ routine coaching.

2.5 What We Expect of Our People Managers

While we are all held to the high ethical standards set out in our Values and the Code, those of us who are people managers are expected to:

- promote awareness and understanding of RBC Values and the Code
- lead by example to make sure our team members know and understand the Code, other policies and relevant laws
- maintain an environment where everyone feels comfortable asking questions, raising concerns and making reports, while respecting the privacy of those who do, and
- promptly escalate concerns and reports of misconduct as appropriate, and follow up to ensure they are addressed.

Our integrity underpins everything we do. **It is the foundation for the way we deal with our clients and communities, work with our partners for a stronger RBC, conduct our many businesses and safeguard our assets. The Code explains how we maintain our culture of doing what's right that makes RBC a great place to do business and to work.**

3. Integrity in Dealing with RBC Clients, Communities and Others

We are committed to promoting fairness in our dealings with our clients, shareholders, suppliers and others, carefully weighing our responsibilities to all stakeholders.

We are in a relationship business and we pride ourselves on the quality of the service and products we provide RBC clients. Integrity and trust help us better serve RBC clients. The same applies to the communities where we live and work, making us a company that people want to do business with and work for.

3.1 Protecting RBC Client Information

Clients care deeply about the privacy of the information they share with us. Protecting their information and keeping their trust is integral to the financial services industry. It's also central to our culture of doing what's right. We each have a duty to keep RBC client information confidential and secure from the risk of theft, loss, improper disclosure or misuse. We do this by complying with RBC's Privacy Risk Management Policy. We are responsible for keeping RBC client information private, even after we leave RBC's service.

When collecting, using and safeguarding client information, we must treat it as we would RBC's own information. We must never share non-public information — accidentally or intentionally — with a third party or colleague who does not have a business need to know.

In the event of improper disclosure or a privacy breach, we must also follow established procedures. We must immediately report a potential or actual privacy breach to our local Privacy Officer, and we must never share any details about the breach with others who do not have a business need to know.

3.2 Protecting RBC Business Information

RBC's business information is one of our most important assets, so we have a duty to safeguard it by complying with RBC information security policies.

For more information, please refer to RBC's Privacy Risk Management Policy and Proprietary information in section 6.2 of this Code.

What can I do to protect RBC business or client information?

- ¡ Operate on a “need to know”, rather than “nice to know” basis, and share RBC business or client information only with those who need it for an appropriate business purpose — and always use proper procedures to share information securely.
- ¡ When working in public places (for example, while commuting, in restaurants or in hotels) take care not to be overheard or allow RBC business or client information to be visible or left behind.
- ¡ Dispose of confidential information as required by RBC’s Privacy Risk Management Policy.
- ¡ Immediately report any potential or actual privacy or information security incidents or breaches.

3.3 Protecting RBC’s Reputation in Our Communities

Individual character and personal activities
We must avoid any conduct or association which could bring our honesty, integrity or trustworthiness into question. RBC’s reputation and security depend on our actions. Remember, even our personal activities outside of work can impact RBC’s reputation. To maintain RBC’s reputation for integrity, we must conduct ourselves professionally and comply with our Values, the Code and relevant RBC policies while at work and even in our personal lives when we could be perceived to represent RBC.

“Off-the-clock” conduct can become an issue when:

- ¡ It damages RBC’s reputation (e.g. you post a disparaging Facebook comment about your manager’s abilities)
- ¡ It impedes our ability to perform our duties (e.g. a mobile mortgage specialist has his/her driver’s licence revoked and cannot drive to see clients)
- ¡ It brings our integrity into question (e.g. employees engage in cyber-bullying of another colleague off hours)

External representation

Our Values and the Code provide a foundation for our behaviour when we represent RBC at work and in our communities. Our integrity and trust must be beyond reproach.

- **Business use of external social media**
  One of the ways RBC communicates is through social media. As with other communications, it is important that our business and corporate social media use is appropriate and consistent with RBC’s general communication strategy. To ensure this, only specifically approved employees may participate in external social media for RBC business or corporate use. This is set out in our Enterprise-Wide Policy on the Usage of External Social Media and in other business-specific social media policies.

  Personal use of social media
  When we participate personally in external or internal social media, we should do so responsibly as we could be considered to represent RBC both at and outside of work. We need to consider the potential impact our comments may have on RBC’s reputation, and be guided by our Values and the standards set out in the Code. Social media is not an appropriate venue to express concerns about RBC, our stakeholders or our competition. RBC provides multiple avenues for us to voice our

concerns and have them addressed. Refer to RBC's Enterprise Guidelines for Personal Use of Social Media for more guidance.

When using social media (for example, Facebook, LinkedIn, Twitter, YouTube, QZone and Google), remember that our words are public and permanent. We should consider the following when using social media:

- Safeguard our personal and professional reputations.
- When we identify ourselves as working for RBC or provide our RBC email address when using social media personally, our actions can reflect on our own and RBC's reputation.
- Confidential, non-public information relating to RBC, RBC clients, employees, contract workers, or other persons must never be a part of our social media conversations (for example RBC's financial information, client and employee personal information, business plans, pending product launches, partnerships with third parties and employment relationships).
- We must not represent RBC's position on an issue without approval from Corporate Communications and our manager.
- If we see an issue involving RBC unfolding in social media, or if we are contacted by the media, we should contact Corporate Communications. We should not try to address the issue ourselves, speak or respond for RBC, unless authorized to by Corporate Communications and our manager.

- **Responding to inquiries from the media**
  We manage and protect RBC's reputation and ensure consistency in managing media inquiries. Only those of us who have been authorized to do so may communicate with the media on RBC's behalf. Media inquiries must be referred to our Corporate Communications representatives; we are not authorized to address media questions ourselves. For more information, refer to RBC's Corporate Media Relations Policy.

Supporting our communities
We support the communities where we live, work and do business. We also accept accountability for the social and economic effects of our business decisions. We take pride in the value of our contributions and encourage employee volunteerism.

We must obtain our manager's permission to solicit for or promote other causes or issues, including charitable ones, in RBC workplaces. Personal contributions to political and charitable causes must be at our own expense and must not interfere with our work at RBC.

Environmental sustainability
RBC promotes environmental sustainability. This means minimizing our environmental footprint and offering environmentally responsible products and services. We believe fulfilling our goals in these areas will lead to short- and long-term benefits for RBC shareholders, clients, colleagues and the communities where we live and do business.

Political involvement and contributions
We support participation in general political processes.

We must not use RBC time or resources to promote political candidates either inside or outside the workplace. If we choose to participate in political activity, we do so on our own behalf and not as representatives of RBC. We must never use our affiliation with RBC to market our political activities.

3.4 Responding to Government or Regulatory Inquiries

From time to time, we may receive an inquiry from government authorities or regulators regarding RBC business. When approached for information, we follow the procedures established for our business unit. This includes escalating the inquiry to our manager or local Compliance group, as appropriate.

4. Integrity in Working Together at RBC

At RBC, we have a strong and capable global team serving our clients, working together to deliver on our strategy, and creating value and growth for our clients, communities and shareholders. We believe in each other and have confidence and trust in the capabilities and intentions of our colleagues. Our integrity, diversity & inclusiveness, and collaboration help make RBC a great place to work, belong and thrive.

4.1 Respectful Workplace

We all have a right to work in a respectful and professional environment. Treating each other with respect and dignity ensures a healthy and productive work environment. We respect our colleagues, RBC clients and others we deal with.

We must all behave in a way that contributes to a workplace free from discrimination, harassment, sexual harassment, violence and retaliation.

Harassment, including sexual harassment, discrimination, violence, retaliation and other disrespectful and inappropriate behaviour are not tolerated at RBC. Harassment is behaviour that, because of its nature or persistence, interferes with a climate of mutual respect for the dignity and worth of each person. It also undermines the integrity of our relationship with RBC and one another.

Maintaining a respectful workplace requires us to behave professionally while working for RBC and when we use RBC systems. We must not use RBC networks, systems, devices or access to the Internet to view or communicate offensive material.

Refer to RBC's Respectful Workplace Policy for details and procedures for reporting breaches.

Not all negative interactions are harassment, discrimination or retaliation. For example,

- minor conflicts that arise because of differences in work or communication styles, and general disagreements and challenges are not harassment, and
- performance management and other manager activities that are part of their responsibilities and performed for legitimate business purposes are not harassment, discrimination or retaliation.

Sexual harassment is a specific form of harassment that includes unwelcome behaviour such as:

- Sexual advances or flirtations
- Propositions or invitations for sexual favours
- "Suggestive" jokes or stories
- Conversations about sexual exploits or desires
- Displaying or circulating sexually suggestive pictures, objects or representations of any action or subject that is sexual in nature

Sexual harassment also occurs where submitting to such behaviour or rejecting such behaviour is the basis for employment decisions.

Speak UP!

- Early, informal and direct communication with the person whose behaviour you feel is inappropriate is encouraged. Often this will put an end to the conduct without resorting to more formal measures
- If you decide not to talk directly to the person, or the conduct continues, you should raise your concern to a manager or Human Resources

Examples of disrespectful and inappropriate behaviour are:

- lewd, profane, abusive or demeaning language (including email communication)
- yelling at another person
- threatening, bullying or intimidation
- fighting
- rough, boisterous or disruptive behaviour, and
- jokes that demean or belittle others, even when no offence is intended – such as racist, sexist and sexual orientation jokes.

4.2 Equal Opportunity, Fair Workplace and Human Rights

Equal opportunity
RBC promotes equal opportunity in all dealings with RBC employees, contract workers, clients and others we deal with. In addition, RBC provides equal opportunity for advancement and growth in the workplace by filling open positions based on business need and candidate merit.

Fair workplace
We treat all employees and contract workers fairly, pay fair compensation and provide respectful work environments. All employees are encouraged to raise concerns directly within RBC using any of the Key Contacts.

Human rights
We comply with all laws regarding non-discrimination and human rights in the jurisdictions where we operate. These laws often prohibit discrimination on certain grounds, such as race, colour, religion, age, gender, marital status, sexual orientation and disability.

Even where laws allow for discrimination on these grounds, RBC operates in a way that doesn't differentiate unfairly.

4.3 Personal Information About Us

Those of us who work at RBC have a right to privacy. Personal information about each of us is confidential. Collection, use and disclosure of this information must be relevant to our working relationship with RBC.

Additionally, when someone confides in us and asks us to keep the information confidential, we must do so, except as required by law or the Code. Keeping information private and confidential is a matter of personal integrity, honouring the trust others place in us. For more information, please refer to RBC's Employee Privacy View.

Personal information about us is used by RBC where needed to manage our working relationships, and must kept confidential as outlined in RBC's Employee Privacy View. It includes:

- information required to verify credentials and education
- employment-related credit checks
- home address
- home phone number and personal cell phone number
- government-issued identification numbers
- compensation
- performance reviews
- corrective/disciplinary actions, and
- health and benefit information and insurance records, including date of birth and non-HIPAA (Health Insurance Portability and Accountability Act) information in the U.S.

4.4 Workplace Health and Safety

RBC is committed to providing a healthy and safe workplace and complying with health and safety laws. Maintaining such a workplace is a shared responsibility of RBC and its managers, employees and contract workers. All employees and contract workers are to take every reasonable and necessary precaution to ensure their health and safety as well as those of their colleagues.

To ensure our workplaces are healthy and safe, we understand and follow RBC's health and safety policies. We also:

- do not have weapons of any kind in our possession while on RBC premises, and
- obtain management approval and ensure any required permits have been obtained before serving alcohol on RBC premises.

5. Integrity in How We Do Business

Ethical behaviour governs every aspect of our business, from day-to-day transactions to special projects.

5.1 Business Dealings

As representatives of RBC, we have a duty to never mislead others — even by omission — about RBC products or services. We must be mindful when evaluating RBC communications that all information is clear and not misleading in any way. This is especially important with regard to our sales representation, marketing and advertising.

To this end, we promptly correct misstatements when we notice them, or when they are brought to our attention. We must make every reasonable effort to provide full and fair information and avoid errors or ambiguity in any statement issued on RBC's behalf. This means we must be knowledgeable about the products and services we promote to ensure our communications about them are accurate.

5.2 Avoiding and Managing Conflicts of Interest

By acting without bias, we can assure RBC stakeholders of our integrity. This means that the decisions we make in our work with RBC must be independent of our personal interests. Obligations arising from our other business, family and social relationships must not play a role in our work for RBC. A conflict of interest — actual, potential or perceived — is a situation that could cause others to doubt our ability to perform our jobs effectively and objectively, without bias. Keep in mind that a conflict of interest can exist even where we have not behaved improperly or unethically. Even the impression of a conflict of interest can affect RBC's reputation and our own.

We cannot prevent or avoid the presence of conflicts of interest, as they arise naturally out of our various relationships with RBC, its clients and others. We can avoid some conflicts of interest, and manage others so that we remain objective in our work at RBC.

We have an ongoing responsibility to identify conflicts of interest in relation to RBC, its clients and its suppliers. This includes potential and perceived conflicts as well as actual ones. We must immediately disclose all conflicts we identify so they can be avoided or managed appropriately.

How can I recognize and manage potential conflicts of interest?

- Think about how your actions would look to others.
- Disclose activities upfront, especially if you are unsure about potential conflict.
- Talk to your manager or local Compliance group if you have any questions.

Some common conflicts of interest are described in the following sections. Note that in these sections *"family"* includes:

- a spouse, common law partner or domestic partner
- children and step-children
- parents and siblings
- grandparents and grandchildren, and
- other relatives by blood or marriage.

For more information, refer to RBC's Conflicts of Interest Policy and related control standards as well as RBC's Enterprise Anti-Bribery Anti-Corruption Policy. These resources also explain how to disclose actual, potential or perceived conflicts.

Managing our dealings with RBC
We often use RBC products and services ourselves, as do many of our friends and family members. We must make sure all our personal, family and friends' dealings with RBC are handled at arm's length – independent of their relationship to us and our relationship with RBC - by following relevant procedures for the business we work in. For more information, we should check with our local Compliance group**.**

Managing working relationships with family and friends
It is possible for our personal relationships to have an effect on our work at RBC. We must understand the actual or perceived effects that personal relationships can have in order to avoid situations that would reflect negatively on RBC.

What types of relationships could cause a conflict of interest?

¡ A direct supervisory relationship with a family member or close friend
¡ A working relationship where we may have the ability to favourably impact compensation, work conditions or promotion prospects of a close friend or family member
¡ An outside activity, external directorship or work arrangement that interferes or competes with RBC's business

Remember, there is no substitute for good judgment and common sense. If we are ever in doubt about a relationship that may put us in a conflict of interest, we should speak with our manager.

Likewise, our loyalties can become conflicted if friends or family members work for a company that does or seeks to do business with RBC as an RBC client or supplier. This is especially likely to be a problem if it happens to those of us who are involved in the approval or selection process, contract negotiations or relationship management with RBC clients or suppliers. In these cases, we must inform our manager or local Compliance group of the potential conflict of interest so it can be addressed.

Managing outside activities or work
Some of us take on additional work or activities outside our work at RBC. This may take the form of part-time work elsewhere, volunteer activity or a personal business run from home. No matter the type of work, these additional activities must not be with one of RBC's competitors. They also must not interfere with our responsibilities to RBC or its clients.

We must be aware of actual, potential or perceived conflicts of interest related to outside activities and must disclose and obtain approval for them as required. Doing so allows us to maintain our commitment to integrity while maximizing our business and relationships.

For more information, refer to the Control Standards for Outside Activities.

Managing external directorships
RBC encourages us to participate in our communities. For example, some of us may choose to take on directorships or similar roles at companies, organizations, clubs, associations or foundations. If we do, the role must not compromise our ability to do our best work for RBC and its clients. We must be careful to avoid actual, potential or perceived conflicts of interest and potential reputational issues. Roles and relationships must be assessed to ensure we comply with the Code and RBC policies on disclosure and approval. Generally, it is not acceptable to act as an officer or director of a client's business.

For publicly traded, private for-profit, not-for-profit, or venture capital entities/organizations, refer to RBC's Conflicts of Interest Policy and the Control Standards for External Directorships for the required process and approvals.

Accepting appointments or inheritances
RBC's clients look to us for advice on their financial matters. Clients may ask or appoint us to represent them or their interests in a variety of situations. These appointments include our acting as attorneys, mandataires, trustees, executors, administrators, liquidators, protectors, and in other appointments or fiduciary roles. In some instances, clients wish to show their appreciation for the value of our services by giving us a gift effective on their death. These can be made in the client's will, by designation as beneficiary under a client's policy, plan or account, or by joint ownership of an asset. To make sure there is no appearance of conflict, we and our families must not accept these requests, appointments, gifts or benefits unless they arise independently of the client relationship. We must ensure we follow established procedures before accepting any appointment or benefit, obtaining management and local Compliance approvals appropriate for the business we work in. When acceptance of certain appointments is part of our role (such as being a discretionary investment manager), we must follow RBC policies.

Managing gifts and entertainment
In business, it is common to foster relationships by exchanging courtesies such as meals, gifts and entertainment. However, we must ensure that the gifts and entertainment we accept are not intended or designed to influence our business judgment on behalf of RBC. Likewise, we must never give gifts or entertainment intended to inappropriately influence someone else's business judgment. To keep our purposes clear, all gifts and entertainment we accept or give must comply with RBC policies. We must take extra caution when the intended recipient of a gift or entertainment is a public official.

In all cases, we must comply with RBC's Conflicts of Interest Policy, the Control Standards for Gifts and Entertainment and RBC's Enterprise Anti-Bribery Anti-Corruption Policy. Your business unit may also have more specific rules; for further information you should contact your local Compliance group.

Gifts are anything of value given or received in relation to RBC business. We may only give or accept gifts that are customary, modest, and culturally sensitive. We must never accept or give cash, bonds or negotiable securities, although gift certificates or gift cards are allowed as long as they cannot be converted into cash.

Key things to remember when considering gifts or entertainment:

- Cash, bonds and negotiable securities are never acceptable gifts regardless of the amount.
- RBC's Control Standards for Gifts and Entertainment set out limits for gifts:
  - $100 CAD in Canada
  - $100 USD in the United States
  - £100 Sterling in the United Kingdom
  - €100 Euro in Europe, and
  - in all other jurisdictions, the local currency equivalent to 100 Canadian dollars.
- Paying for a client's travel or lodging expenses is not permitted; similarly, receiving travel or lodging expenses is also not permitted.
- Entertainment must not seem excessive or inappropriate; if unsure, seek guidance from your manager or Compliance before accepting an invitation.
- Seek guidance from Compliance before providing a gift or entertainment to a public official.
- Gifts and entertainment must not create a sense of obligation for either party – it's never wrong to question the motive behind business gifts and entertainment.
- Whether your business unit has specific rules regarding gifts or entertainment.

Entertainment includes any event we host or attend for business related purposes. Common examples include meals, sporting events, theatrical performances and educational events. Entertainment should always be in good taste and consistent with usual business practice. As with gifts, we must avoid entertainment that is too lavish or expensive because it may also be seen to influence our judgment.

If only one party attends the event, then it is considered a gift. For example, if a supplier gives us tickets to an event, but does not attend, then we must follow the control standard for gifts.

RBC also has control standards around payment for travel or lodging expenses. These apply to situations where RBC is providing entertainment or where we are accepting travel or lodging expenses from a third party.

5.3 Preventing Financial Crime

Anti-money laundering ("AML") and anti-terrorist financing
Money laundering and terrorist financing are serious issues in many parts of the world. Global efforts to prevent these crimes receive significant attention from regulators, governments, international organizations and law enforcement agencies.

It is important that we know and comply with all laws and RBC policies designed to detect and deter money laundering and terrorist financing activities. To do this, we must be vigilant and exercise good judgment when dealing with unusual or suspicious transactions or activities.

For more information, please refer to RBC's Anti-Money Laundering and Anti-Terrorist Financing Policy.

What can I do to identify and prevent money laundering?

- Know your clients ("KYC"), verify their identity and that of any beneficial owners, and obtain evidence of their source of wealth and source of funds.
- Identify and escalate as soon as possible any unusual activity you believe may potentially be related to money laundering or terrorist financing activity.
- Never advise ('tip off') anyone suspected of possible money laundering or terrorist financing activity of your concerns or notify them of any potential reporting.
- Never alter, remove or disguise information to facilitate a transaction that would otherwise be prohibited under the law.

Anti-bribery and anti-corruption

Government and other groups globally are working to fight corruption because of its damaging effects on countries, communities and businesses. We support these efforts through our commitment to operate with integrity. We are committed to doing business based on the quality of RBC's reputation and the services we provide, and not because we have gained any dishonest or unfair advantage. We continue to enhance our Anti-Bribery Anti-Corruption Policy and other controls to be sure that we abide by the anti-corruption laws in place wherever we do business.

What can I do to identify and prevent bribery and corruption?

- We must not solicit, give, receive or promise any "item of value", either directly or indirectly, with the intent of helping RBC obtain an advantage. This includes offering, providing or receiving excessive or inappropriate gifts and entertainment.
- We must not make facilitation payments. Facilitation payments are typically small payments or fees made to government officials to obtain or speed up routine actions or services such as obtaining licences or permits. If in doubt, always check with Compliance before considering a payment.
- We must not knowingly facilitate any transaction involving or associated with the proceeds of bribery and corruption.

For more information, please refer to RBC's Enterprise Anti-Bribery Anti-Corruption Policy and RBC's Control Standards for Gifts and Entertainment.

5.4 Securities Trading

Many of the countries where we do business have laws regarding when we can trade in securities issued by any company.

Before trading in the securities of RBC, its clients or any other company, we must familiarize ourselves with RBC's policies on personal trading, as well as the effect that the perception of wrongdoing may have.

From time to time, we may have access to material, non-public (or "inside") information about a company, including RBC or its clients. As a rule, inside information can reasonably be expected to affect the market value or price of a company's securities. Similarly, a reasonable investor would consider it

important when deciding whether to buy, sell or hold onto a security. When we have inside information about a company, we must not trade in the securities of that company. Doing so is called “insider trading” – which is illegal and subject to fines and penalties. It is also illegal to provide inside information to another (this is usually called “tipping”) unless it is necessary to accomplish a legitimate business purpose.

For more information, refer to RBC’s Inside Information and Information Barriers Policy and the Personal Trading Policy.

- Directors of Royal Bank of Canada should refer to the *Insider Trading and Reporting Policy and Procedures for Directors of Royal Bank of Canada.*
- Non-executive directors of subsidiaries of Royal Bank of Canada who are not otherwise officers, employees, or directors of Royal Bank of Canada, should refer to the Policy on Inside Information and Personal Trading for Non-Executive Directors of Subsidiaries of Royal Bank of Canada.

5.5 Fair Competition

RBC seeks to ensure fair business practices are followed wherever we do business. Many countries where we do business have laws to promote fair competition and reduce monopolistic (or anti-competitive) activity.

At RBC, each of us has a responsibility to know and comply with applicable competition and anti-trust laws. We need to be able to recognize and avoid situations that may conflict with these laws. To ensure we comply with these laws, we must be especially careful when dealing with competitors of RBC. Never agree or arrange with a competitor to do any of the following:

- fix, maintain, increase or try to control the price of a product or service
- divide or allocate sales, clients or markets for the supply of products or services, or
- fix, maintain, increase, lessen, or otherwise try to control the supply of a product or service.

We take great care at industry association meetings or other events where we may interact with competitors. If a competitor mentions any of these practices, we should voice our disagreement and withdraw from the discussion. While industry associations can provide excellent opportunities for networking and business development, they pose challenges as well. When attending events, we must be careful to avoid even the appearance that RBC participates in or endorses unfair or manipulative business conduct.

Other examples of activities where competition issues arise:

- bid-rigging, or secretly making agreements with other bidders when submitting bids or tenders
- making availability of a product or service conditional on the purchase of another product or service
- communications that could be interpreted to show an anti-competitive intent or behaviour, such as advertisements that are misleading, unfair or inaccurate when they compare RBC products with those of our competitors, or

- any other act that is likely to harm competition substantially if done in circumstances where we are dominant in a market or a class of business.

For more information, please refer to RBC's Enterprise Anti-Trust and Competition Law Policy.

5.6 International Trade Controls

Exports
Because we deliver RBC products and services internationally, we are subject to global trade laws, including exports and re-exports from the U.S. and other countries. Always be sure that we have any necessary export licenses or permits.

Violations of trade control laws can have severe consequences for both RBC and the individuals involved. Therefore, we must be aware of relevant requirements and contact the General Counsel Group or Compliance with any questions.

Sanctions
RBC complies with national and multinational sanctions and regulations that apply to our businesses. We must all be aware of any sanctions that impact the work we do and follow RBC procedures. Contact the General Counsel Group or Global Economic Sanctions for advice if you are unsure of the right course of action.

For more information, please refer to RBC's Global Economic Sanctions Policy.

6. Integrity in Safeguarding Entrusted Assets

As a financial institution, we manage the assets in our care responsibly and ethically to earn and maintain our stakeholders' trust.

6.1 Protecting RBC Client Property

In order to earn RBC clients' trust, we must safeguard their property. This property should be used only in accordance with their directions, relevant RBC policy and the law. Using this property inappropriately or for personal gain is a violation of this trust.

6.2 Protecting RBC Property

Fraud, misappropriation and other types of misconduct

Many of us have access to premises, systems and information about RBC processes that are not available to RBC clients or the general public. We must never use this access or information to benefit ourselves, our families or our friends, or for any purpose unrelated to the performance of our duties. Fraud, misappropriation of property or corporate opportunities and other types of misuse are never tolerated.

Acts of fraud may include intentionally concealing or misrepresenting facts for the purpose of inducing, deceiving or misleading others.

Some examples of fraud are:

- improper financial reporting (such as improper revenue recognition and over- or understating assets or liabilities)
- deliberate failure to fulfill our disclosure obligations, and
- falsifying records.

"Misappropriation" includes theft or other intentional misuse of RBC assets, systems, processes or RBC client funds. Misuse can include any purpose not related to the performance of our duties.

Some examples of misappropriation and misuse are:

- intentional personal use of RBC expense accounts or corporate credit cards — expense accounts and corporate credit cards must be used only for expenses eligible for reimbursement under RBC's expense guidelines
- unauthorized "borrowing" and "kiting" (taking advantage of the time delay required for an item to clear)
- obtaining funds through false pretences such as depositing a cheque known to be NSF (Non- Sufficient Funds) or making an "empty envelope deposit" in an automated banking machine, and
- personally taking advantage of opportunities identified through the use of corporate property, information or position.

Proprietary information
RBC proprietary information includes non-public or undisclosed information we withhold from general knowledge. This information is critical to our business, and could be useful to our competitors or harmful to RBC if disclosed.

Some examples of proprietary information are:

- RBC client lists and trade secrets
- technical and statistical information
- financial documents
- contract documentation
- legal or business matters
- business processes, and
- corporate strategies and plans.

RBC's proprietary information may be disclosed to outside parties only if required by law or if properly authorized. Even then, we disclose the information only once the appropriate confidentiality agreement has been signed. Our responsibility to safeguard RBC's proprietary information continues, even after we leave RBC's service. Proprietary information is to be protected in keeping with RBC's Privacy Risk Management Policy.

Trademarks, copyright and other intellectual property
RBC intellectual property has important commercial value and is crucial to RBC's effective competition in the marketplace. It includes any of the following that we create while working for RBC:

- inventions, improvements, works of authorship, developments, concepts or ideas
- data, processes, online websites or applications, computer software programs, or discoveries, and
- trade secrets, trademarks, brand names, copyrights or logos.

Any intellectual property we generate in our RBC work belongs to RBC and remains with RBC after we leave RBC's service. We should use RBC intellectual property only as permitted in this Code and RBC policies.

RBC intellectual property must not be used by a third party without our prior approval. Similarly, we may use a third party's intellectual property only with the third party's prior approval. For example, all original musical, artistic and literary works, computer software, performances and sound recordings are protected by copyright laws. We must not download, install or copy software to our RBC-issued computers without first obtaining the owner's permission.

We should seek guidance from the General Counsel Group if we suspect RBC intellectual property has been infringed upon or otherwise misused, or if we have any questions on the use of intellectual property.

Proper use of RBC networks, systems software, devices and the Internet
Most of the equipment, systems and technologies that we use in our work belong to RBC. This includes RBC computer networks, software, computers and portable devices, as well as the messages communicated with them. Where RBC policies permit us to use our personal equipment for RBC work, we must follow the policies associated with that use.

When sending communications through RBC networks, we must always maintain a professional tone and comply with the Code and RBC policies including the Respectful Workplace Policy. We follow these requirements whether we are using RBC equipment or our own.

RBC reserves the right to monitor, audit and inspect our use of RBC systems and technology, including internet usage and email. While we may use of RBC equipment, systems and technology for personal reasons on occasion, we must always comply with the Code and RBC policies, including the Respectful Workplace Policy, and our personal use must be reasonable. In line with this policy, we must not use these systems to view or communicate inappropriate material. These systems also must not be used to do work on behalf of another business or organization, unless authorized by RBC.

Some examples of inappropriate material are:

- sexually explicit material
- gambling websites
- derogatory jokes, or
- statements or images about any demographic group such as racial, religious, disability status, or sex/gender.

6.3 Keeping Accurate Books and Records

RBC's credibility depends on the integrity of its books, records and accounting. Clients rely on us to maintain and provide accurate records of their dealings with us — a duty RBC takes seriously. We must ensure RBC's books and records are accurate, timely and complete, and reflect RBC business, operations, earnings and financial status.

To maintain accurate books and records, we follow internal processes and procedures. This includes capturing information in the proper system and labelling it correctly so it is complete and accurate.

We are expected to act honestly and with integrity in handling RBC accounts at all times. For instance, overstating an amount on an expense report or falsifying a sales record in order to exceed a target would be serious violations of RBC's trust in us and the Code. False statements such as these are never tolerated, no matter how small the amount or the reason behind the action.

We all provide information that RBC uses to prepare financial statements, regulatory reports and publicly-filed documents. This means we all play a role in ensuring that the information we record complies with all applicable accepted accounting principles and RBC internal controls.

Keep in mind that falsifying financial or business records (including client documentation) or making false statements to our auditors is against the law. Likewise, it is unethical, unlawful and prohibited to make a payment or establish an account on RBC's behalf for any purpose other than as described in supporting documentation.

7. Conclusion

Our Code of Conduct is integral to the way we do business at RBC. It helps define our culture of doing what's right and provides all of us with the same frame of reference for dealing with issues that can be both sensitive and complex.

"We are all responsible for protecting and enhancing RBC's reputation by following our Code of Conduct. It's also important that we support one another in doing what's right, including feeling empowered to challenge situations we believe are wrong." ***Dave McKay, President and CEO, RBC***

Exhibit 5

Industry Guide 3 — Return on Equity and Assets Ratios

	For the Year Ended October 2016	For the Year Ended October 2015	For the Year Ended October 2014
Return on Assets	0.89%	0.95%	0.99%
Return on Equity	16.3%	18.6%	19.0%
Dividend Payout Ratio	48%	46%	47%
Equity to Asset Ratio	5.90%	5.57%	5.74%

Results are from Consolidated Financial Statements.

Exhibit 7

CONSOLIDATED RATIOS OF EARNINGS TO FIXED CHARGES

The tables below set forth our consolidated ratios of earnings to fixed charges, calculated in accordance with International Financial Reporting Standards (**IFRS**), for five-year period ended October 31, 2016:

	Year ended October 31, 2016	Year ended October 31, 2015	Year ended October 31, 2014	Year ended October 31, 2013	Year ended October 31, 2012
Excluding Interest on Deposits	5.90	6.14	6.23	5.34	4.88
Including Interest on Deposits	2.61	2.53	2.43	2.28	2.12

For purposes of computing these ratios, earnings represent net income plus income taxes and fixed charges (excluding capitalized interest). Fixed charges represent (i) estimated interest within rental expense, (ii) amortization of debt issuance costs, and (iii) interest (including capitalized interest), including or excluding deposit interest as indicated.

Royal Bank of Canada and Subsidiaries
Ratio of Earnings to Fixed Charges and Preferred Dividends

(Canadian dollars in millions)	Year Ended October 31 2016	Year Ended October 31 2015	Year Ended October 31 2014	Year Ended October 31 2013	Year Ended October 31 2012	
Excluding Interest on Deposits						
Net Income before income taxes	$ 13,299	$ 12,623	$ 11,710	$ 10,447	$ 9,513	
Less: Income/(loss) from equity investees (Note 1)	(184)	(146)	(162)	(139)	6	***Note 1***
Fixed Charges:						
Interest expense (excl. Deposits)	$ 2,454	$ 2,235	$ 2,030	$ 2,205	$ 2,298	
Estimated interest within rental expense	220	193	177	169	155	
Total fixed charges	2,674	2,428	2,207	2,374	2,453	
Preferred dividend requirements (note 2)	374	240	277	317	328	***Note 2***
Fixed charges and preferred dividends	3,048	2,668	2,484	2,691	2,781	
Earnings	15,789	14,905	13,755	12,682	11,972	
Ratio of earnings to fixed charges	**5.90**	**6.14**	**6.23**	**5.34**	**4.88**	
Ratio of earnings to fixed charges and preferred dividends	**5.18**	**5.59**	**5.54**	**4.71**	**4.31**	
Including Interest on Deposits						
Net Income before income taxes	$ 13,299	$ 12,623	$ 11,710	$ 10,447	$ 9,513	
Less: Income/(loss) from equity investees (Note 1)	(184)	(146)	(162)	(139)	6	***Note 1***
Fixed Charges:						
Interest expense (incl. Deposits)	$ 7,921	$ 7,958	$ 7,903	$ 7,899	$ 8,379	
Estimated interest within rental expense	220	193	177	169	155	
Total fixed charges	8,141	8,151	8,080	8,068	8,534	
Preferred dividend requirements (note 2)	374	240	277	317	328	***Note 2***
Fixed charges and preferred dividends	8,515	8,391	8,357	8,385	8,862	
Earnings	21,256	20,628	19,628	18,376	18,053	
Ratio of earnings to fixed charges	**2.61**	**2.53**	**2.43**	**2.28**	**2.12**	
Ratio of earnings to fixed charges and preferred dividends	**2.50**	**2.46**	**2.35**	**2.19**	**2.04**	

Note (1)	2016	2015	2014	2013	2012
Equity in Undistributed Earnings of Unconsolidated Subsidiaries Calculation (C $'000s):					
Associated Corporations					
(equity accounted investments - IFRS)	176	149	162	159	162
Impairment of investments in JV and associates	8	(3)	-	(20)	(168)
	184	146	162	139	(6)
Note: Losses are presented with a negative sign in this calculation.					
Note (2)					
Preferred Dividend Requirements Calculation (C $ millions):					
Preferred Dividends (per Income Statement)	294	191	213	253	258
Taxable Equivalent Gross-up (1-Effective Tax Rate for period)	78.6%	79.4%	76.9%	79.9%	78.9%
Preferred Dividend Requirement	374	240	277	317	327
Effective Tax Rate	21.4%	20.6%	23.1%	20.1%	21.1%

Exhibit 31.1

SOX 302 CERTIFICATION

I, David I. McKay, certify that:

1. I have reviewed this annual report on Form 40-F of Royal Bank of Canada;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the issuer as of, and for, the periods presented in this report;
4. The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the issuer and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the issuer's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the issuer's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the issuer's internal control over financial reporting; and
5. The issuer's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the issuer's auditors and the audit committee of the issuer's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the issuer's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the issuer's internal control over financial reporting.

November 30, 2016

/s/ David I. McKay

Name: David I. McKay
Title: President and Chief Executive Officer

Exhibit 31.2

SOX 302 CERTIFICATION

I, Janice R. Fukakusa, certify that:

1. I have reviewed this annual report on Form 40-F of Royal Bank of Canada;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the issuer as of, and for, the periods presented in this report;
4. The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the issuer and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the issuer's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the issuer's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the issuer's internal control over financial reporting; and
5. The issuer's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the issuer's auditors and the audit committee of the issuer's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the issuer's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the issuer's internal control over financial reporting.

November 30, 2016

/s/ Janice R. Fukakusa

Name: Janice R. Fukakusa
Title: Chief Administrative Officer and Chief Financial Officer

Exhibit 32.1

CERTIFICATIONS

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), the undersigned officer of Royal Bank of Canada, a Canadian chartered Bank (the "Bank"), hereby certifies, to such officer's knowledge, that:

The annual report on Form 40-F for the year ended October 31, 2016 (the "Report") of the Bank fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Bank.

Dated: November 30, 2016

/s/ David I. McKay

Name: David I. McKay
Title: President and Chief Executive Officer

Exhibit 32.2

CERTIFICATIONS

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), the undersigned officer of Royal Bank of Canada, a Canadian chartered Bank (the "Bank"), hereby certifies, to such officer's knowledge, that:

The annual report on Form 40-F for the year ended October 31, 2016 (the "Report") of the Bank fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Bank.

Dated: November 30, 2016

/s/ Janice R. Fukakusa

Name: Janice R. Fukakusa
Title: Chief Administrative Officer and Chief Financial Officer