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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

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	As at 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

						Other components of equity						
(Millions of Canadian dollars)	Preferred shares	Common shares	Treasury shares – preferred	Treasury shares – common	Retained earnings	Available-for-sale securities	Foreign currency translation	Cash flow hedges	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

	As at											
	October 31, 2016						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
(Millions of Canadian dollars)	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%
	Obligations related to securities sold short		1		Credit Spread	1.51%	12.54%	7.02%
					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				Market comparable	EV/EBITDA multiples	6.94X	15.50X	9.65X
	Equities	1,132		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)	Derivative-related assets	566		Discounted cash flows	Interest rates	1.79%	2.43%	Even
	Derivative-related liabilities		1,014	Option pricing model	CPI swap rates	1.49%	1.97%	Even
					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%
	Obligations related to securities				Credit Spread	n.a.	n.a.	n.a.
	sold short		–		Credit enhancement	n.a.	n.a.	n.a.
Government debt and municipal				Price-based	Prices	$ 64.98	$ 126.22	$ 84.50
bonds	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				Market comparable	EV/EBITDA multiples	4.67X	15.50X	7.38X
investments and related equity	Equities	1,110		Price-based	P/E multiples	9.40X	22.40X	12.14X
derivatives	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	Derivative-related assets	428		Discounted cash flows	Interest rates	2.25%	2.27%	Even
interest-rate-linked structured	Derivative-related liabilities		822	Option pricing model	CPI swap rates	1.67%	1.90%	Even
notes (7)					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-				Discounted cash flows	Dividend yields	0.01%	29.09%	Lower
linked structured notes (7)	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)	For the year ended October 31, 2015 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
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

	As at October 31, 2016					
		Fair value may not approximate carrying value				
	Fair value always approximates	Fair value measurements using				Total
(Millions of Canadian dollars)	carrying value (1)	Level 1	Level 2	Level 3	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

	As at October 31, 2015					
		Fair value may not approximate carrying value				
	Fair value always approximates	Fair value measurements using				Total
(Millions of Canadian dollars)	carrying value (1)	Level 1	Level 2	Level 3	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

	As at							
	October 31, 2016				October 31, 2015			
(Millions of Canadian dollars)	Canada	United States	Other International	Total	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

	As at October 31, 2016							
	Maturity term (1)				Rate sensitivity			
(Millions of Canadian dollars)	Under 1 year (2)	1 to 5 years	Over 5 years	Total	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

	As at October 31, 2015							
	Maturity term (1)				Rate sensitivity			
(Millions of Canadian dollars)	Under 1 year (2)	1 to 5 years	Over 5 years	Total	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.

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.

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)

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

	As at October 31, 2015					
	Term to maturity					
(Millions of Canadian dollars)	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)	October 31, 2016 Less than 1 year	1 to 5 years	Over 5 years	Total	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)	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

(Millions of Canadian dollars)	As at October 31, 2015								
	Risk rating (1)					Counterparty type (2)			
	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

	As at October 31, 2015					
(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, 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		October 31, 2015		October 31, 2014	
	Average balances	Average rates	Average balances	Average rates	Average balances	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)

	As at					
	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars, except percentages)	Fair value	Percentage of total plan assets	Quoted in active market (2)	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.

	As at		
	October 31, 2016		
(Millions of Canadian dollars, except participants and years)	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.

Maturity (Millions of Canadian dollars, except percentage and foreign currency)	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.

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

				Earliest redemption date	As at	
(Millions of Canadian dollars, except for percentage amounts)	Issuance date	Distribution dates	Annual yield	At the option of the issuer	October 31 2016 Principal amount	October 31 2015 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.

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

(Canadian dollars per share except share amounts and years)	Options outstanding			Options exercisable	
	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

(Canadian dollars per share except percentages and years)	For the year ended 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			October 31, 2015			October 31, 2014		
	Units granted during the year		Units outstanding at the end of the year	Units granted during the year		Units outstanding at the end of the year	Units granted during the year		Units outstanding at the end of the year
	Number granted (thousands)	Weighted average fair value	Carrying amount	Number granted (thousands)	Weighted average fair value	Carrying amount	Number granted (thousands)	Weighted average fair value	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

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:

	As at					
	October 31, 2016			October 31, 2015		
(Millions of Canadian dollars)	Total future minimum lease payments	Future interest charges	Present value of finance lease commitments	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:

	As at			
	October 31, 2016		October 31, 2015	
(Millions of Canadian dollars)	Land and buildings	Equipment	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

	For the year ended October 31, 2014									
(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)	$ 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.

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

(Millions of Canadian dollars)	As at 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

(Millions of Canadian dollars)	For the year ended 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.

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

		IFRS					CGAAP				
(Millions of Canadian dollars, except percentages and per share amounts)	**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.