

Statement of Management's Responsibility for Financial Information

Management of Bank of Montreal (the "bank") is responsible for the preparation and presentation of the annual consolidated financial statements, Management's Discussion and Analysis ("MD&A") and all other information in the Annual Report.

The consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board and meet the applicable requirements of the Canadian Securities Administrators ("CSA") and the Securities and Exchange Commission ("SEC") in the United States. The financial statements also comply with the provisions of the *Bank Act (Canada)* and related regulations, including interpretations of IFRS by our regulator, the Office of the Superintendent of Financial Institutions Canada. The MD&A has been prepared in accordance with the requirements of securities regulators, including National Instrument 51-102 *Continuous Disclosure Obligations* of the CSA.

The consolidated financial statements and information in the MD&A necessarily include amounts based on informed judgments and estimates of the expected effects of current events and transactions with appropriate consideration to materiality. In addition, in preparing the financial information we must interpret the requirements described above, make determinations as to the relevancy of information to be included, and make estimates and assumptions that affect reported information. The MD&A also includes information regarding the impact of current transactions and events, sources of liquidity and capital resources, operating trends, risks and uncertainties. Actual results in the future may differ materially from our present assessment of this information because events and circumstances in the future may not occur as expected.

The financial information presented in the bank's Annual Report is consistent with that in the consolidated financial statements.

In meeting our responsibility for the reliability and timeliness of financial information, we maintain and rely on a comprehensive system of internal controls, including organizational and procedural controls, disclosure controls and procedures, and internal control over financial reporting. Our system of internal controls includes written communication of our policies and procedures governing corporate conduct and risk management; comprehensive business planning; effective segregation of duties; delegation of authority and personal accountability; escalation of relevant information for decisions regarding public disclosure; careful selection and training of personnel; and accounting policies that we regularly update. Our internal controls are designed to provide reasonable assurance that transactions are authorized, assets are safeguarded and proper records are maintained and that we are in compliance with all regulatory requirements. 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.

As of October 31, 2019, we, as the bank's Chief Executive Officer and Chief Financial Officer, have determined that the bank's internal control over financial reporting is effective. We have certified Bank of Montreal's annual filings with the CSA and with the SEC pursuant to National Instrument 52-109, *Certification of Disclosure in Issuers' Annual and Interim Filings* and the *Securities Exchange Act of 1934*.

In order to provide their audit opinions on our consolidated financial statements and on the bank's internal control over financial reporting, the Shareholders' Auditors audit our system of internal controls over financial reporting and conduct work to the extent that they consider appropriate. Their audit opinion on the bank's internal control over financial reporting as of October 31, 2019 is set forth on page 136.

The Board of Directors, based on recommendations from its Audit and Conduct Review Committee, reviews and approves the financial information contained in the Annual Report, including the MD&A. The Board of Directors and its relevant committees oversee management's responsibilities for the preparation and presentation of financial information, maintenance of appropriate internal controls, compliance with legal and regulatory requirements, management and control of major risk areas, and assessment of significant and related party transactions.

The Audit and Conduct Review Committee, which is comprised entirely of independent directors, is also responsible for selecting the Shareholders' Auditors and reviewing the qualifications, independence and performance of both the Shareholders' Auditors and internal audit. The Shareholders' Auditors and the bank's Chief Auditor have full and free access to the Board of Directors, its Audit and Conduct Review Committee and other relevant committees to discuss audit, financial reporting and related matters.

The Office of the Superintendent of Financial Institutions Canada conducts examinations and inquiries into the affairs of the bank as are deemed necessary to ensure that the provisions of the *Bank Act*, with respect to the safety of the depositors, are being duly observed and that the bank is in sound financial condition.



Darryl White
Chief Executive Officer



Thomas E. Flynn
Chief Financial Officer

Toronto, Canada
December 3, 2019

Independent Auditors' Report

To the Shareholders of Bank of Montreal

Opinion

We have audited the consolidated financial statements of Bank of Montreal (the Bank), which comprise:

- the consolidated balance sheets as at October 31, 2019 and October 31, 2018
- the consolidated statements of income for each of the years in the three-year period ended October 31, 2019
- the consolidated statements of comprehensive income for each of the years in the three-year period ended October 31, 2019
- the consolidated statements of changes in equity for each of the years in the three-year period ended October 31, 2019
- the consolidated statements of cash flows for each of the years in the three-year period ended October 31, 2019
- and notes to the consolidated financial statements, including a summary of significant accounting policies

(Hereinafter referred to as the consolidated financial statements).

In our opinion, the consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Bank as at October 31, 2019 and October 31, 2018, and its consolidated financial performance and its consolidated cash flows for each of the years in the three-year period ended October 31, 2019 in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditors' Responsibilities for the Audit of the Consolidated Financial Statements* section of our auditors' report.

We are independent of the Bank in accordance with the ethical requirements that are relevant to our audit of the consolidated financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements for the year ended October 31, 2019. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

The key audit matters for the consolidated financial statements are set out below.

Assessment of the Allowances for Credit Losses for Loans

Refer to Notes 1 and 4 to the consolidated financial statements.

The Bank's allowance for credit losses (ACL) as at October 31, 2019 was \$2,094 million. The Bank's ACL consists of allowances for impaired loans and allowances for performing loans (APL), both calculated under the IFRS 9 Financial Instruments expected credit losses framework. APL is calculated on a probability-weighted basis, based on the Bank's forecast of future economic scenarios, for each exposure in the loan portfolio as a function of the probability of default (PD), exposure at default (EAD) and loss given default (LGD). In establishing APL, the Bank attaches probability weightings to three economic scenarios, which represent the Bank's view of a range of forecast economic conditions – a base case scenario being the Bank's view of the most probable outcome, as well as benign and adverse scenarios. Where there has been a significant increase in credit risk, lifetime APL is recorded; otherwise 12 months of APL is generally recorded. The significant increase in credit risk assessment is based on the change in PD between the origination date and reporting date and is assessed using probability weighted scenarios. The Bank uses experienced credit judgment (ECJ) to reflect factors not captured in the results produced by the APL models.

We identified the assessment of the ACL as a key audit matter because there was a high degree of measurement uncertainty in the key inputs, methodologies and judgments and their resulting impact on credit losses, as described above. Assessing the APL required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this key audit matter included the following. We tested certain internal controls over the Bank's APL process with the involvement of credit risk, economics, and information technology professionals with specialized skills, industry knowledge and relevant experience. These included controls related to (1) the monitoring of the PD, LGD and EAD parameters and model validation, (2) technology controls over the data used in the APL models and the APL calculation, (3) the assessment to identify significant increases in credit risk, and (4) the review of the macroeconomic variables, probability weighting of scenarios and ECJ. We also tested the controls over the Bank's APL process related to loan reviews for determination of loan risk grades for wholesale loans. We involved credit risk, economics, and information technology professionals with specialized skills, industry knowledge and relevant experience, who assisted in evaluating the (1) PD, LGD and EAD parameters produced by the models and the methodology for compliance with IFRS including the determination of significant increases in credit risk, and (2) key data inputs including historical data used in monitoring of model parameters, and the macroeconomic variables and probability weighting of scenarios used in the models, including consideration of alternative inputs for certain macroeconomic variables. For a sample of wholesale loans we evaluated the Bank's assigned credit risk ratings to loans against the Bank's borrower risk rating scale. We assessed the ECJ overlays applied by the Bank to the APL through the application of our knowledge of the industry and credit judgment.

Assessment of the Measurement of the Fair Value of Difficult-to-value Securities

Refer to Notes 1, 3 and 17 to the consolidated financial statements.

The Bank's securities portfolio included \$164,122 million of securities as at October 31, 2019 that are measured at fair value. Included in these amounts are certain difficult-to-value securities for which the Bank determines fair value using models and third party net asset valuations (NAVs) that use significant unobservable market information. Unobservable inputs require the use of significant judgment. The key unobservable inputs used in the valuation of such difficult-to-value securities are NAVs, discount margins, prepayment rates and EV/EBITDA multiples.

We identified the assessment of the measurement of the fair value of difficult-to-value securities as a key audit matter because there was a high degree of measurement uncertainty in the prepayment rates and NAVs that required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this key audit matter included the following. We tested certain internal controls over the Bank's process to determine the fair value of its difficult-to-value securities with the involvement of valuation and information technology professionals with specialized skills, industry knowledge and relevant experience. These included controls related to the (1) development and ongoing validation of valuation models and methodologies, (2) review of third party NAVs and other key inputs, (3) independent price verification, and (4) segregation of duties and access controls. We also tested the controls related to the assessment of fair value hierarchy classification. We tested, with involvement of valuation professionals with specialized skills, industry knowledge and relevant experience, the fair value of a sample of difficult-to-value securities. Depending on the nature of the security, we did this by comparing the key unobservable inputs noted above to external information or by developing an independent estimate of fair value and comparing it to the fair value determined by the Bank.

Assessment of Income Tax Uncertainties

Refer to Notes 1 and 22 to the consolidated financial statements.

In determining the provision for income taxes, the Bank interprets tax legislation, case law and administrative positions, and, based on its judgment, records an estimate of the amount required to settle tax obligations.

We identified the assessment of income tax uncertainties as a key audit matter. There was a high degree of subjectivity and judgment required in assessing the need to record a provision, based on interpretation of tax law, for these uncertainties and estimating the amount of such provision, if necessary. This required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this key audit matter included the following. We tested certain internal controls over the Bank's process for evaluating income tax uncertainties with the involvement of tax professionals with specialized skills, industry knowledge and relevant experience. These included controls related to the 1) identification of tax uncertainties based on interpretation of tax law, and 2) determination of the best estimate of the provision required, if any. We involved tax professionals with specialized skills, industry knowledge and relevant experience, who assisted in 1) evaluating the Bank's interpretations of tax laws and the assessment of certain tax uncertainties and expected outcomes, including, if applicable, the measurement thereof, 2) reading advice obtained by the Bank from external specialists, and 3) reading correspondence with taxation authorities.

Assessment of Insurance-related Liabilities

Refer to Notes 1 and 14 to the consolidated financial statements.

The Bank's insurance-related liabilities as at October 31, 2019 were \$11,581 million. The Bank determines the liabilities for life insurance contracts by applying the Canadian Asset Liability Method for Insurance Contracts, which incorporates best-estimate assumptions for mortality, morbidity, policy lapses, surrenders, future investment yields, policy dividends, administration costs and margins for adverse deviation.

We identified the assessment of insurance-related liabilities as a key audit matter, because there was a high degree of measurement uncertainty in the key assumptions, being mortality, policy lapses and future investment yields, that required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this key audit matter included the following. We tested certain internal controls over the Bank's process for the measurement of insurance-related liabilities, including controls over 1) the assessment of the key assumptions noted above, and 2) contract data used in the calculation of the insurance-related liabilities. Actuarial professionals with specialized skills, industry knowledge and relevant experience were involved in testing the controls over the key assumptions. We involved actuarial professionals with specialized skills, industry knowledge and relevant experience in testing the key assumptions noted above by examining the internal and external experience studies conducted by the Bank to support these estimates. We tested a sample of the underlying policyholder data used in the measurement of the liability to source documentation.

Other Information

Management is responsible for the other information. Other information comprises:

- the information included in Management's Discussion and Analysis filed with the relevant Canadian Securities Commissions.
- the information, other than the consolidated financial statements and the auditors' report thereon, included in a document entitled the Annual Report.

Our opinion on the consolidated financial statements does not cover the other information and we do not and will not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit and remain alert for indications that the other information appears to be materially misstated.

We obtained the information included in Management's Discussion and Analysis and the Annual Report filed with the relevant Canadian Securities Commissions as at the date of this auditors' report. If, based on the work we have performed on this other information, we conclude that there is a material misstatement of this other information, we are required to report that fact in the auditors' report. We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with IFRS 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.

In preparing the consolidated financial statements, management is responsible for assessing the Bank's ability to continue as a going concern, disclosing as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Bank or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Bank's financial reporting process.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the consolidated financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Bank's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Bank's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Bank to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.
- Provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Bank to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.
- Determine, from the matters communicated with those charged with governance, those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our auditors' report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

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Chartered Professional Accountants, Licensed Public Accountants

Toronto, Canada

December 3, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders of Bank of Montreal

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Bank of Montreal (the Bank) as at October 31, 2019 and 2018, the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the years in the three-year period ended October 31, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Bank as at October 31, 2019 and 2018, and its financial performance and its cash flows for each of the years in the three-year period ended October 31, 2019, in conformity with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Bank's internal control over financial reporting as of October 31, 2019, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated December 3, 2019 expressed an unqualified opinion on the effectiveness of the Bank's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Bank's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Bank in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the Audit and Conduct Review Committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Assessment of the Allowances for Credit Losses for Loans

As discussed in Notes 1 and 4 to the consolidated financial statements, the Bank's allowance for credit losses (ACL) as at October 31, 2019 was \$2,094 million. The Bank's ACL consists of allowances for impaired loans and allowances for performing loans (APL), both calculated under the IFRS 9 Financial Instruments expected credit losses framework. APL is calculated on a probability-weighted basis, based on the Bank's forecast of future economic scenarios, for each exposure in the loan portfolio as a function of the probability of default (PD), exposure at default (EAD) and loss given default (LGD). In establishing APL, the Bank attaches probability weightings to three economic scenarios, which represent the Bank's view of a range of forecast economic conditions – a base case scenario being the Bank's view of the most probable outcome, as well as benign and adverse scenarios. Where there has been a significant increase in credit risk, lifetime APL is recorded; otherwise 12 months of APL is generally recorded. The significant increase in credit risk assessment is based on the change in PD between the origination date and reporting date and is assessed using probability weighted scenarios. The Bank uses experienced credit judgment (ECJ) to reflect factors not captured in the results produced by the APL models.

We identified the assessment of the ACL as a critical audit matter because there was a high degree of measurement uncertainty in the key inputs, methodologies and judgments and their resulting impact on credit losses, as described above. Assessing the APL required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Bank's APL process with the involvement of credit risk, economics, and information technology professionals with specialized skills, industry knowledge and relevant experience. These included controls related to (1) the monitoring of the PD, LGD and EAD parameters and model validation, (2) technology controls over the data used in the APL models and the APL calculation, (3) the assessment to identify significant increases in credit risk, and (4) the review of the macroeconomic variables, probability weighting of scenarios and ECJ. We also tested the controls over the Bank's APL process related to loan reviews for determination of loan risk grades for wholesale loans. We involved credit risk, economics, and information technology professionals with specialized skills, industry knowledge and relevant experience, who assisted in evaluating the (1) PD, LGD and EAD parameters produced by the models and the methodology for compliance with IFRS including the determination of significant increases in credit risk, and (2) key data inputs including historical data used in monitoring of model parameters, and the macroeconomic variables and probability weighting of scenarios used in the models, including consideration of alternative inputs for certain macroeconomic variables. For a sample of wholesale loans we evaluated the Bank's assigned credit risk ratings to loans against the Bank's borrower risk rating scale. We assessed the ECJ overlays applied by the Bank to the APL through the application of our knowledge of the industry and credit judgment.

Assessment of the Measurement of the Fair Value of Difficult-to-value Securities

As discussed in Notes 1, 3 and 17 to the consolidated financial statements, the Bank's securities portfolio included \$164,122 million of securities as at October 31, 2019 that are measured at fair value. Included in these amounts are certain difficult-to-value securities for which the Bank determines fair value using models and third party net asset valuations (NAVs) that use significant unobservable market information. Unobservable inputs require the use of significant judgment. The key unobservable inputs used in the valuation of such difficult-to-value securities are NAVs, discount margins, prepayment rates and EV/EBITDA multiples.

We identified the assessment of the measurement of the fair value of difficult-to-value securities as a critical audit matter because there was a high degree of measurement uncertainty in the prepayment rates and NAVs, that required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Bank's process to determine the fair value of its difficult-to-value securities with the involvement of valuation and information technology professionals with specialized skills, industry knowledge and relevant experience. These included controls related to the (1) development and ongoing validation of valuation models and methodologies, (2) review of third party NAVs and other key inputs, (3) independent price verification, and (4) segregation of duties and access controls. We also tested the controls related to the assessment of fair value hierarchy classification. We tested, with the involvement of valuation professionals with specialized skills, industry knowledge and relevant experience, the fair value of a sample of difficult-to-value securities. Depending on the nature of the security, we did this by comparing the key unobservable inputs noted above to external information or by developing an independent estimate of fair value and comparing it to the fair value determined by the Bank.

Assessment of Income Tax Uncertainties

As discussed in Notes 1 and 22 to the consolidated financial statements, in determining the provision for income taxes, the Bank interprets tax legislation, case law and administrative positions, and, based on its judgment, records an estimate of the amount required to settle tax obligations.

We identified the assessment of income tax uncertainties as a critical audit matter. There was a high degree of subjectivity and judgment required in assessing the need to record a provision, based on interpretation of tax law, for these uncertainties and estimating the amount of such provision, if necessary. This required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Bank's process for evaluating income tax uncertainties with the involvement of tax professionals with specialized skills, industry knowledge and relevant experience. These included controls related to the 1) identification of tax uncertainties based on interpretation of tax law and 2) determination of the best estimate of the provision required, if any. We involved tax professionals with specialized skills, industry knowledge and relevant experience, who assisted in 1) evaluating the Bank's interpretations of tax laws and the assessment of certain tax uncertainties and expected outcomes, including, if applicable, the measurement thereof, 2) reading advice obtained by the Bank from external specialists, and 3) reading correspondence with taxation authorities.

Assessment of Insurance-related Liabilities

As discussed in Notes 1 and 14 to the consolidated financial statements, the Bank's insurance-related liabilities as at October 31, 2019 were \$11,581 million. The Bank determines the liabilities for life insurance contracts by applying the Canadian Asset Liability Method for Insurance Contracts, which incorporates best-estimate assumptions for mortality, policy lapses, surrenders, future investment yields, policy dividends, administration costs and margins for adverse deviation.

We identified the assessment of insurance-related liabilities as a critical audit matter, because there was a high degree of measurement uncertainty in the key assumptions, being mortality, policy lapses and future investment yields, that required significant auditor attention and complex auditor judgment, and knowledge and experience in the industry.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Bank's process for the measurement of insurance-related liabilities, including controls over 1) the assessment of the key assumptions noted above, and 2) contract data used in the calculation of the insurance-related liabilities. Actuarial professionals with specialized skills, industry knowledge and relevant experience were involved in testing the controls over the key assumptions. We involved actuarial professionals with specialized skills, industry knowledge and relevant experience in testing the key assumptions noted above by examining the internal and external experience studies conducted by the Bank to support these estimates. We tested a sample of the underlying policyholder data used in the measurement of the liability to source documentation.

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Chartered Professional Accountants, Licensed Public Accountants

We have served as the Bank's auditor since 2004 and as joint auditor for the prior 11 years.

Toronto, Canada
December 3, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders of Bank of Montreal

Opinion on Internal Control over Financial Reporting

We have audited Bank of Montreal's internal control over financial reporting as of October 31, 2019, based on the criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

In our opinion, Bank of Montreal (the Bank) maintained, in all material respects, effective internal control over financial reporting as of October 31, 2019, based on the criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Bank as at October 31, 2019, and 2018, the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the years in the three-year period ended October 31, 2019, and the related notes (collectively, the consolidated financial statements) and our report dated December 3, 2019 expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Bank's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Annual Report on Disclosure Controls and Procedures and Internal Control over Financial Reporting, on page 113 of Management's Discussion and Analysis. Our responsibility is to express an opinion on the Bank's internal control over financial reporting based on our audit.

We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Bank in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

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Chartered Professional Accountants, Licensed Public Accountants

Toronto, Canada

December 3, 2019

Consolidated Statement of Income

For the Year Ended October 31 (Canadian \$ in millions, except as noted)	2019	2018	2017
Interest, Dividend and Fee Income			
Loans	\$ 19,824	\$ 16,275	\$ 13,564
Securities (Note 3) (1)	5,541	4,119	3,525
Deposits with banks	787	641	324
	26,152	21,035	17,413
Interest Expense			
Deposits	8,616	6,080	3,894
Subordinated debt	279	226	155
Other liabilities	4,369	3,291	2,089
	13,264	9,597	6,138
Net Interest Income	12,888	11,438	11,275
Non-Interest Revenue			
Securities commissions and fees	1,023	1,025	964
Deposit and payment service charges	1,204	1,134	1,109
Trading revenues	298	705	84
Lending fees	1,181	997	917
Card fees	437	428	329
Investment management and custodial fees	1,747	1,749	1,627
Mutual fund revenues	1,419	1,473	1,411
Underwriting and advisory fees	986	943	1,044
Securities gains, other than trading (Note 3)	249	239	171
Foreign exchange gains, other than trading	166	182	191
Insurance revenue	3,183	1,879	2,070
Investments in associates and joint ventures	151	167	386
Other	551	546	529
	12,595	11,467	10,832
Total Revenue	25,483	22,905	22,107
Provision for Credit Losses (Notes 1 and 4)	872	662	746
Insurance Claims, Commissions and Changes in Policy Benefit Liabilities (Note 14)	2,709	1,352	1,538
Non-Interest Expense			
Employee compensation (Notes 20 and 21)	8,423	7,461	7,468
Premises and equipment (Note 9)	2,988	2,753	2,491
Amortization of intangible assets (Note 11)	554	503	485
Travel and business development	545	519	540
Communications	296	282	286
Professional fees	568	572	569
Other	1,256	1,387	1,353
	14,630	13,477	13,192
Income Before Provision for Income Taxes	7,272	7,414	6,631
Provision for income taxes (Note 22)	1,514	1,961	1,292
Net Income	\$ 5,758	\$ 5,453	\$ 5,339
Attributable to:			
Equity holders of the bank	5,758	5,453	5,337
Non-controlling interest in subsidiaries	-	-	2
Net Income	\$ 5,758	\$ 5,453	\$ 5,339
Earnings Per Common Share (Canadian \$) (Note 23)			
Basic	\$ 8.68	\$ 8.19	\$ 7.93
Diluted	8.66	8.17	7.90
Dividends per common share	4.06	3.78	3.56

(1) Includes interest income on securities measured at fair value through other comprehensive income and amortized cost, calculated using the effective interest rate method, of \$1,853 million for the year ended October 31, 2019 (\$1,290 million for the year ended October 31, 2018).

The accompanying notes are an integral part of these consolidated financial statements.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).



Darryl White
Chief Executive Officer



Jan Babiak
Chair, Audit and Conduct Review Committee

Consolidated Statement of Comprehensive Income

For the Year Ended October 31 (Canadian \$ in millions)	2019	2018	2017
Net Income	\$ 5,758	\$ 5,453	\$ 5,339
Other Comprehensive Income (Loss), net of taxes (Note 22)			
Items that may subsequently be reclassified to net income			
Net change in unrealized gains (losses) on fair value through OCI debt securities			
Unrealized gains (losses) on fair value through OCI debt securities arising during the year (1)	412	(251)	na
Unrealized gains on available-for-sale securities arising during the year (2)	na	na	95
Reclassification to earnings of (gains) in the year (3)	(72)	(65)	(87)
	340	(316)	8
Net change in unrealized gains (losses) on cash flow hedges			
Gains (losses) on derivatives designated as cash flow hedges arising during the year (4)	1,444	(1,228)	(839)
Reclassification to earnings of losses on derivatives designated as cash flow hedges (5)	143	336	61
	1,587	(892)	(778)
Net gains (losses) on translation of net foreign operations			
Unrealized gains (losses) on translation of net foreign operations	(11)	417	(885)
Unrealized gains (losses) on hedges of net foreign operations (6)	(13)	(155)	23
	(24)	262	(862)
Items that will not be reclassified to net income			
Gains (losses) on remeasurement of pension and other employee future benefit plans (7)	(552)	261	420
Gains (losses) on remeasurement of own credit risk on financial liabilities designated at fair value (8)	75	(24)	(148)
Unrealized gains on fair value through OCI equity securities arising during the year (9)	1	-	na
	(476)	237	272
Other Comprehensive Income (Loss), net of taxes (Note 22)	1,427	(709)	(1,360)
Total Comprehensive Income	\$ 7,185	\$ 4,744	\$ 3,979
Attributable to:			
Equity holders of the bank	7,185	4,744	3,977
Non-controlling interest in subsidiaries	-	-	2
Total Comprehensive Income	\$ 7,185	\$ 4,744	\$ 3,979

(1) Net of income tax (provision) recovery of \$(140) million, \$69 million and na for the year ended, respectively.

(2) Net of income tax (provision) of na, na and \$(21) million for the year ended, respectively.

(3) Net of income tax provision of \$26 million, \$23 million and \$36 million for the year ended, respectively.

(4) Net of income tax (provision) recovery of \$(521) million, \$432 million and \$322 million for the year ended, respectively.

(5) Net of income tax (recovery) of \$(51) million, \$(121) million and \$(21) million for the year ended, respectively.

(6) Net of income tax (provision) recovery of \$4 million, \$56 million and \$(8) million for the year ended, respectively.

(7) Net of income tax (provision) recovery of \$196 million, \$(111) million and \$(157) million for the year ended, respectively.

(8) Net of income tax (provision) recovery of \$(27) million, \$6 million and \$53 million for the year ended, respectively.

(9) Net of income tax (provision) of \$(1) million, \$nil and na for the year ended, respectively.

na - not applicable due to IFRS 9 adoption.

The accompanying notes are an integral part of these consolidated financial statements.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Consolidated Balance Sheet

As at October 31 (Canadian \$ in millions)	2019	2018
Assets		
Cash and Cash Equivalents (Note 2)	\$ 48,803	\$ 42,142
Interest Bearing Deposits with Banks (Note 2)	7,987	8,305
Securities (Note 3)		
Trading	85,903	99,697
Fair value through profit or loss	13,704	11,611
Fair value through other comprehensive income	64,515	62,440
Debt securities at amortized cost	24,472	6,485
Other	844	702
	189,438	180,935
Securities Borrowed or Purchased Under Resale Agreements (Note 4)	104,004	85,051
Loans (Notes 4 and 6)		
Residential mortgages	123,740	119,620
Consumer instalment and other personal	67,736	63,225
Credit cards	8,859	8,329
Business and government	227,609	194,456
	427,944	385,630
Allowance for credit losses (Notes 1 and 4)	(1,850)	(1,639)
	426,094	383,991
Other Assets		
Derivative instruments (Note 8)	22,144	25,422
Customers' liability under acceptances (Note 12)	23,593	18,585
Premises and equipment (Note 9)	2,055	1,986
Goodwill (Note 11)	6,340	6,373
Intangible assets (Note 11)	2,424	2,272
Current tax assets	1,165	1,515
Deferred tax assets (Note 22)	1,568	2,039
Other (Note 12)	16,580	14,677
	75,869	72,869
Total Assets	\$ 852,195	\$ 773,293
Liabilities and Equity		
Deposits (Note 13)	\$ 568,143	\$ 520,928
Other Liabilities		
Derivative instruments (Note 8)	23,598	23,629
Acceptances (Note 14)	23,593	18,585
Securities sold but not yet purchased (Note 14)	26,253	28,804
Securities lent or sold under repurchase agreements (Note 6)	86,656	66,684
Securitization and structured entities' liabilities (Notes 6 and 7)	27,159	25,051
Current tax liabilities	55	50
Deferred tax liabilities (Note 22)	60	74
Other (Note 14)	38,607	36,985
	225,981	199,862
Subordinated Debt (Note 15)	6,995	6,782
Equity		
Preferred shares and other equity instruments (Note 16)	5,348	4,340
Common shares (Note 16)	12,971	12,929
Contributed surplus	303	300
Retained earnings	28,725	25,850
Accumulated other comprehensive income	3,729	2,302
Total Equity	51,076	45,721
Total Liabilities and Equity	\$ 852,195	\$ 773,293

The accompanying notes are an integral part of these consolidated financial statements.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Consolidated Statement of Changes in Equity

For the Year Ended October 31 (Canadian \$ in millions)	2019	2018	2017
Preferred Shares and Other Equity Instruments (Note 16)			
Balance at beginning of year	\$ 4,340	\$ 4,240	\$ 3,840
Issued during the year	1,008	400	900
Redeemed during the year	-	(300)	(500)
Balance at End of Year	5,348	4,340	4,240
Common Shares (Note 16)			
Balance at beginning of year	12,929	13,032	12,539
Issued under the Shareholder Dividend Reinvestment and Share Purchase Plan	-	-	448
Issued under the Stock Option Plan	62	99	146
Repurchased for cancellation	(20)	(202)	(101)
Balance at End of Year	12,971	12,929	13,032
Contributed Surplus			
Balance at beginning of year	300	307	294
Stock option expense, net of options exercised (Note 20)	-	(12)	6
Other	3	5	7
Balance at End of Year	303	300	307
Retained Earnings			
Balance at beginning of year	25,850	23,700	21,207
Impact from adopting IFRS 9 (Note 28)	-	99	na
Net income attributable to equity holders of the bank	5,758	5,453	5,337
Dividends - Preferred shares (Note 16)	(211)	(184)	(184)
- Common shares (Note 16)	(2,594)	(2,424)	(2,312)
Equity issue expense	(8)	(5)	(9)
Common shares repurchased for cancellation (Note 16)	(70)	(789)	(339)
Balance at End of Year	28,725	25,850	23,700
Accumulated Other Comprehensive Income (Loss) on Fair Value through OCI Securities, net of taxes (1)			
Balance at beginning of year	(315)	56	48
Impact from adopting IFRS 9 (Note 28)	-	(55)	na
Unrealized gains (losses) on fair value through OCI debt securities arising during the year	412	(251)	na
Unrealized gains on fair value through OCI equity securities arising during the year	1	-	na
Unrealized gains on available-for-sale securities arising during the year	na	na	95
Reclassification to earnings of (gains) during the year	(72)	(65)	(87)
Balance at End of Year	26	(315)	56
Accumulated Other Comprehensive Income (Loss) on Cash Flow Hedges, net of taxes			
Balance at beginning of year	(1,074)	(182)	596
Gains (losses) on derivatives designated as cash flow hedges arising during the year (Note 8)	1,444	(1,228)	(839)
Reclassification to earnings of losses on derivatives designated as cash flow hedges in the year	143	336	61
Balance at End of Year	513	(1,074)	(182)
Accumulated Other Comprehensive Income on Translation of Net Foreign Operations, net of taxes			
Balance at beginning of year	3,727	3,465	4,327
Unrealized gains (losses) on translation of net foreign operations	(11)	417	(885)
Unrealized gains (losses) on hedges of net foreign operations	(13)	(155)	23
Balance at End of Year	3,703	3,727	3,465
Accumulated Other Comprehensive Income (Loss) on Pension and Other Employee Future Benefit Plans, net of taxes			
Balance at beginning of year	169	(92)	(512)
Gains (losses) on remeasurement of pension and other employee future benefit plans (Note 21)	(552)	261	420
Balance at End of Year	(383)	169	(92)
Accumulated Other Comprehensive Loss on Own Credit Risk on Financial Liabilities Designated at Fair Value, net of taxes			
Balance at beginning of year	(205)	(181)	(33)
Gains (losses) on remeasurement of own credit risk on financial liabilities designated at fair value	75	(24)	(148)
Balance at End of Year	(130)	(205)	(181)
Total Accumulated Other Comprehensive Income	3,729	2,302	3,066
Total Equity	\$ 51,076	\$ 45,721	\$ 44,345
Non-controlling Interest in Subsidiaries			
Balance at beginning of year	-	-	24
Net income attributable to non-controlling interest	-	-	2
Redemption/purchase of non-controlling interest	-	-	(25)
Other	-	-	(1)
Balance at End of Year	-	-	-
Total Equity	\$ 51,076	\$ 45,721	\$ 44,345

(1) Fiscal 2017 represents available-for-sale securities (Note 1).
na - not applicable due to IFRS 9 adoption.

The accompanying notes are an integral part of these consolidated financial statements.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Consolidated Statement of Cash Flows

For the Year Ended October 31 (Canadian \$ in millions)	2019	2018	2017
Cash Flows from Operating Activities			
Net Income	\$ 5,758	\$ 5,453	\$ 5,339
Adjustments to determine net cash flows provided by (used in) operating activities			
Provision on securities, other than trading (Note 3)	1	1	7
Net (gain) on securities, other than trading (Note 3)	(250)	(240)	(178)
Net (increase) decrease in trading securities	13,816	(2,650)	(16,237)
Provision for credit losses (Note 4)	872	662	746
Change in derivative instruments – Decrease in derivative asset – (Decrease) in derivative liability	6,902 (3,774)	6,069 (7,481)	15,544 (14,923)
Depreciation of premises and equipment (Note 9)	435	400	391
Amortization of other assets	216	224	227
Amortization of intangible assets (Note 11)	554	503	485
Net decrease in deferred income tax asset	483	832	156
Net increase (decrease) in deferred income tax liability	(15)	2	(12)
Net (increase) decrease in current income tax asset	354	(232)	(497)
Net increase (decrease) in current income tax liability	6	(87)	52
Change in accrued interest – (Increase) in interest receivable – Increase in interest payable	(299) 313	(366) 337	(130) 15
Changes in other items and accruals, net	(1,255)	2,078	(3,405)
Net increase in deposits	48,009	34,138	15,409
Net (increase) in loans	(43,381)	(23,089)	(6,823)
Net increase (decrease) in securities sold but not yet purchased	(2,524)	2,004	336
Net increase in securities lent or sold under repurchase agreements	20,358	452	16,535
Net (increase) in securities borrowed or purchased under resale agreements	(19,396)	(2,958)	(10,891)
Net increase in securitization and structured entities' liabilities	2,120	1,860	762
Net Cash Provided by Operating Activities	29,303	17,912	2,908
Cash Flows from Financing Activities			
Net increase (decrease) in liabilities of subsidiaries	(1,227)	2,203	(87)
Proceeds from issuance of covered bonds (Note 13)	4,168	2,706	5,845
Redemption of covered bonds (Note 13)	(3,765)	(567)	(2,602)
Proceeds from issuance of subordinated debt (Note 15)	1,000	2,685	850
Repayment of subordinated debt (Note 15)	(1,000)	(900)	(100)
Proceeds from issuance of preferred shares and other equity instruments (Note 16)	1,008	400	900
Redemption of preferred shares (Note 16)	–	(300)	(500)
Equity issue expense	(8)	(5)	(9)
Proceeds from issuance of common shares (Note 16)	54	88	149
Common shares repurchased for cancellation (Note 16)	(90)	(991)	(440)
Cash dividends and distributions paid	(2,752)	(2,582)	(2,010)
Net Cash Provided by (Used in) Financing Activities	(2,612)	2,737	1,996
Cash Flows from Investing Activities			
Net (increase) decrease in interest bearing deposits with banks	329	(1,648)	(2,245)
Purchases of securities, other than trading	(63,496)	(46,749)	(30,424)
Maturities of securities, other than trading	13,154	14,754	5,930
Proceeds from sales of securities, other than trading	31,561	23,561	24,400
Purchase of non-controlling interest	–	–	(25)
Premises and equipment – net (purchases) (Note 9)	(478)	(330)	(301)
Purchased and developed software – net (purchases) (Note 11)	(650)	(556)	(490)
Acquisitions (Note 10)	–	(365)	–
Net Cash (Used in) Investing Activities	(19,580)	(11,333)	(3,155)
Effect of Exchange Rate Changes on Cash and Cash Equivalents	(450)	227	(803)
Net increase in Cash and Cash Equivalents	6,661	9,543	946
Cash and Cash Equivalents at Beginning of Year	42,142	32,599	31,653
Cash and Cash Equivalents at End of Year (Note 2)	\$ 48,803	\$ 42,142	\$ 32,599
Supplemental Disclosure of Cash Flow Information			
Net cash provided by operating activities includes:			
Interest paid in the year	\$ 12,956	\$ 8,790	\$ 5,826
Income taxes paid in the year	\$ 1,209	\$ 1,261	\$ 1,338
Interest received in the year	\$ 23,966	\$ 18,867	\$ 15,553
Dividends received in the year	\$ 1,740	\$ 1,736	\$ 2,063

The accompanying notes are an integral part of these consolidated financial statements.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Note 1: Basis of Presentation

Bank of Montreal (“the bank”) is a chartered bank under the *Bank Act (Canada)* and is a public company incorporated in Canada. We are a highly diversified financial services company, providing a broad range of personal and commercial banking, wealth management and investment banking products and services. The bank’s head office is at 129 rue Saint-Jacques, Montreal, Quebec. Our executive offices are at 100 King Street West, 1 First Canadian Place, Toronto, Ontario. Our common shares are listed on the Toronto Stock Exchange (“TSX”) and the New York Stock Exchange.

We have prepared these consolidated financial statements in accordance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”). We also comply with interpretations of IFRS by our regulator, the Office of the Superintendent of Financial Institutions Canada (“OSFI”).

Our consolidated financial statements have been prepared on a historic cost basis, except for the revaluation of the following items: assets and liabilities held for trading; financial assets and liabilities measured or designated at fair value through profit or loss (“FVTPL”); financial assets measured or designated at fair value through other comprehensive income (“FVOCI”); financial assets and financial liabilities designated as hedged items in qualifying fair value hedge relationships; cash-settled share-based payment liabilities; defined benefit pension and other employee future benefit liabilities; and insurance-related liabilities.

These consolidated financial statements were authorized for issue by the Board of Directors on December 3, 2019.

Basis of Consolidation

These consolidated financial statements are inclusive of the financial statements of our subsidiaries as at October 31, 2019. We conduct business through a variety of corporate structures, including subsidiaries, structured entities (“SEs”), associates and joint ventures. Subsidiaries are those entities where we exercise control through our ownership of the majority of the voting shares. We also hold interests in SEs, which we consolidate when we control the SEs. These are more fully described in Note 7. All of the assets, liabilities, revenues and expenses of our subsidiaries and consolidated SEs are included in our consolidated financial statements. All intercompany transactions and balances are eliminated on consolidation.

We hold investments in associates, where we exert significant influence over operating and financing decisions (generally companies in which we own between 20% and 50% of the voting shares). These are accounted for using the equity method. The equity method is also applied to our investments in joint ventures, which are entities where we exercise joint control through an agreement with other shareholders. 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 investee net income or loss, including other comprehensive income or loss. Our equity accounted investments are recorded as other securities and our share of the net income or loss is recorded in investments in associates and joint ventures, in our Consolidated Statement of Income. Any other comprehensive income amounts are reflected in the relevant section of our Consolidated Statement of Comprehensive Income. Additional information regarding accounting for other securities is included in Note 3.

Specific Accounting Policies

To facilitate a better understanding of our consolidated financial statements, we have disclosed our significant accounting policies throughout the following notes with the related financial disclosures by major caption:

Note	Topic	Page	Note	Topic	Page
1	Basis of Presentation	142	17	Fair Value of Financial Instruments and Trading-Related Revenue	179
2	Cash and Interest Bearing Deposits with Banks	147	18	Offsetting of Financial Assets and Financial Liabilities	187
3	Securities	147	19	Capital Management	187
4	Loans and Allowance for Credit Losses	151	20	Employee Compensation – Share-Based Compensation	188
5	Risk Management	158	21	Employee Compensation – Pension and Other Employee Future Benefits	190
6	Transfer of Assets	159	22	Income Taxes	194
7	Structured Entities	160	23	Earnings Per Share	197
8	Derivative Instruments	162	24	Commitments, Guarantees, Pledged Assets, Provisions and Contingent Liabilities	197
9	Premises and Equipment	171	25	Operating and Geographic Segmentation	199
10	Acquisitions	172	26	Significant Subsidiaries	203
11	Goodwill and Intangible Assets	172	27	Related Party Transactions	204
12	Other Assets	173	28	Transition to IFRS 9	205
13	Deposits	174			
14	Other Liabilities	175			
15	Subordinated Debt	176			
16	Equity	177			

Translation of Foreign Currencies

We conduct business in a variety of foreign currencies and present our consolidated financial statements in Canadian dollars, which is our functional currency. Monetary assets and liabilities, as well as non-monetary assets and liabilities measured at fair value that are denominated in foreign currencies, are translated into Canadian dollars at the exchange rate in effect at the balance sheet date. Non-monetary assets and liabilities not measured at fair value are translated into Canadian dollars at historical rates. Revenues and expenses denominated in foreign currencies are translated using the average exchange rate for the year.

Unrealized gains and losses arising from translating our net investment in foreign operations into Canadian dollars, net of related hedging activities and applicable income taxes, are included in our Consolidated Statement of Comprehensive Income within net gains (losses) on translation of net foreign operations. When we dispose of a foreign operation such that control, significant influence or joint control is lost, the cumulative amount of the translation gain (loss) and any applicable hedging activities and related income taxes is reclassified to our Consolidated Statement of Income as part of the gain or loss on disposition.

Foreign currency translation gains and losses on equity securities measured at FVOCI that are denominated in foreign currencies are included in accumulated other comprehensive income on FVOCI equity securities, net of taxes, in our Consolidated Statement of Changes in Equity. All other foreign currency translation gains and losses are included in foreign exchange gains, other than trading, in our Consolidated Statement of Income as they arise.

From time to time, we enter into foreign exchange hedge contracts to reduce our exposure to changes in the value of foreign currencies. Realized and unrealized gains and losses that arise on the mark-to-market of foreign exchange contracts related to economic hedges are included in non-interest revenue in our Consolidated Statement of Income. Changes in the fair value of derivative contracts that qualify as accounting hedges are recorded in our Consolidated Statement of Comprehensive Income within net change in unrealized gains (losses) on derivatives designated as cash flow hedges, with the spot/forward differential (the difference between the foreign currency exchange rate at the inception of the contract and the rate at the end of the contract) recorded in interest income (expense) over the term of the hedge.

Revenue

Dividend Income

Dividend income is recognized when the right to receive payment is established. This is the ex-dividend date for listed equity securities.

Fee Income

Securities commissions and fees are earned in Wealth Management and Capital Markets on brokerage transactions executed for customers, generally as a fixed fee per share traded, where the commissions and related clearing expense are recognized on trade date. There are also fees based on a percentage of the customer's portfolio holdings that entitle clients to investment advice and a certain number of trades which are recorded over the period to which they relate.

Deposit and payment service charges are primarily earned in Personal and Commercial Banking and include monthly account maintenance fees and other activity-based fees earned on deposit and cash management services. Fees are recognized over time or at a point in time, i.e. over the period that account maintenance and cash management services are provided, or when an income-generating activity is performed.

Card fees arise in Personal and Commercial Banking and primarily include interchange income, late fees and annual fees. Card fees are recorded when the related services are provided, except for annual fees, which are recorded evenly throughout the year. Interchange income is calculated as a percentage of the transaction amount and/or a fixed price per transaction as established by the payment network and is recognized when the card transaction is settled. Reward costs for certain of our cards are recorded as a reduction in card fees.

Investment management and custodial fees are earned in Wealth Management and are based primarily on the balance of assets under management or assets under administration, as at the period end, for investment management, custodial, estate and trustee services provided. Fees are recorded over the period the services are performed.

Mutual fund revenues arise in Wealth Management and are earned on fund management services which are primarily calculated and recorded based on a percentage of the fund's net asset value. The fees are recorded over the period the services are performed.

Underwriting and advisory fees are earned in Capital Markets and arise from securities offerings in which we act as an underwriter or agent, structuring and administering loan syndications and fees earned from providing merger-and-acquisition services and structuring advice. Underwriting and advisory fees are generally recognized when the services or milestones are completed.

Leases

We are lessors in both financing leases and operating leases. Leases are classified as financing leases if they transfer substantially all the risks and rewards incidental to ownership of the leased asset to the lessee. Otherwise they are classified as operating leases, as we retain substantially all the risks and rewards of asset ownership.

As lessor in a financing lease, a loan is recognized equal to the investment in the lease, which is calculated as the present value of the minimum payments to be received from the lessee, discounted at the interest rate implicit in the lease, plus any unguaranteed residual value we expect to recover at the end of the lease. Finance lease income is recognized in interest, dividend and fee income, loans, in our Consolidated Statement of Income.

Assets under operating leases are recorded in other assets in our Consolidated Balance Sheet. Rental income is recognized on a straight-line basis over the term of the lease in non-interest revenue, other, in our Consolidated Statement of Income. Depreciation on these assets is recognized on a straight-line basis over the life of the lease in non-interest expense, other, in our Consolidated Statement of Income.

Assets Held-for-Sale

Non-current non-financial assets classified as held-for-sale are measured at the lower of their carrying amount and fair value less costs to sell and are presented within other assets in our Consolidated Balance Sheet. Subsequent to its initial classification, a non-current asset is no longer depreciated or amortized, and any subsequent write-down in fair value less costs to sell is recognized in non-interest revenue, other, in our Consolidated Statement of Income.

Changes in Accounting Policies

Revenue

Effective November 1, 2018, we adopted IFRS 15 *Revenue from Contracts with Customers* ("IFRS 15"). We elected to retrospectively present prior periods as if IFRS 15 had always been applied. Under the new standard, the primary impact is the reclassification of amounts within the Consolidated Statement of Income. As a result, loyalty rewards and cash promotion costs on cards previously recorded in non-interest expense are presented as a reduction in non-interest revenue. In addition, when customers reimburse us for certain out-of-pocket expenses incurred on their behalf, we now record the reimbursement in non-interest revenue. Previously, these reimbursements were recorded as a reduction in the related expense. There is minimal impact to net income as IFRS 15 does not require discounting of loyalty reward liabilities and we now amortize the costs to obtain card customers, which were previously expensed as incurred.

The following table summarizes the impacts of applying IFRS 15 on our prior period Consolidated Statement of Income:

(Canadian \$ in millions)	2018	2017
Increase (decrease) in		
Non-Interest Revenue		
Securities commissions and fees	(4)	(5)
Deposit and payment service charges	(10)	(14)
Card fees	(136)	(150)
Investment management and custodial fees	7	5
Underwriting and advisory fees	7	8
Other	4	3
	(132)	(153)
Non-Interest Expense		
Employee compensation	2	1
Travel and business development	(154)	(153)
Professional fees	8	6
Other	8	8
	(136)	(138)
Provision for income taxes	1	(4)
Net Income	3	(11)

Share-based Payment

Effective November 1, 2018, we adopted amendments to IFRS 2 *Share-based Payment* in relation to the classification and measurement of share-based payment transactions. There was no impact to our consolidated financial statements.

Financial Instruments

Effective November 1, 2017, we adopted IFRS 9 *Financial Instruments* ("IFRS 9"), which replaced IAS 39 *Financial Instruments: Recognition and Measurement* ("IAS 39"). IFRS 9 addresses impairment, classification and measurement, and hedge accounting. 2017 amounts in our Consolidated Statement of Income and Consolidated Statement of Comprehensive Income have not been restated. The impact to equity at November 1, 2017 was an increase of \$70 million (\$44 million after tax) related to the impairment requirements of the standard. Refer to Note 28, Transition to IFRS 9 for the impact on the opening balance sheet at November 1, 2017 and for accounting policies under IAS 39, which were applicable in the year ended October 31, 2017.

Use of Estimates and Judgments

The preparation of the consolidated financial statements requires management to use estimates and assumptions that affect the carrying amounts of certain assets and liabilities, certain amounts reported in net income and other related disclosures.

The most significant assets and liabilities for which we must make estimates include allowance for credit losses; financial instruments measured at fair value; pension and other employee future benefits; impairment of securities; income taxes and deferred tax assets; goodwill and intangible assets; insurance-related liabilities; and provisions. We make judgments in assessing the business model for financial assets as well as whether substantially all risks and rewards have been transferred in respect of transfers of financial assets and whether we control SEs, as discussed in Notes 6 and 7, respectively. If actual results were to differ from the estimates, the impact would be recorded in future periods.

We have established detailed policies and control procedures that are intended to ensure these judgments are well controlled, independently reviewed and consistently applied from period to period. We believe that our estimates of the value of our assets and liabilities are appropriate.

Allowance for Credit Losses

The expected credit loss ("ECL") model requires the recognition of credit losses generally based on 12 months of expected losses for performing loans and the recognition of lifetime losses on performing loans that have experienced a significant increase in credit risk since origination.

The determination of a significant increase in credit risk takes into account many different factors and varies by product and risk segment. The main factors considered in making this determination are relative changes in probability of default since origination, and certain other criteria, such as 30-day past due and watchlist status. The assessment of a significant increase in credit risk requires experienced credit judgment.

In determining whether there has been a significant increase in credit risk and in calculating the amount of expected credit losses, we must rely on estimates and exercise judgment regarding matters for which the ultimate outcome is unknown. These judgments include changes in circumstances that may cause future assessments of credit risk to be materially different from current assessments, which could require an increase or decrease in the allowance for credit losses.

The calculation of expected credit losses includes the explicit incorporation of forecasts of future economic conditions. We have developed models incorporating specific macroeconomic variables that are relevant to each portfolio. Key economic variables for our retail portfolios include primary operating markets of Canada, the United States (U.S.) and regional markets where considered significant. Forecasts are developed internally by our Economics group, considering external data and our view of future economic conditions. We exercise experienced credit judgment to incorporate multiple economic forecasts which are probability-weighted in the determination of the final expected credit loss. The allowance is sensitive to changes in both economic forecasts and the probability weight assigned to each forecast scenario.

Additional information regarding the allowance for credit losses is included in Note 4.

Financial Instruments Measured at Fair Value

Fair value measurement techniques are used to value various financial assets and financial liabilities, and are also used in performing impairment testing on certain non-financial assets.

Additional information regarding our fair value measurement techniques is included in Note 17.

Pension and Other Employee Future Benefits

Our pension and other employee future benefits expense is calculated by our independent actuaries using assumptions determined by management. If actual experience were to differ from the assumptions used, we would recognize this difference in other comprehensive income.

Pension and other employee future benefits expense, plan assets and defined benefit obligations are also sensitive to changes in discount rates. We determine discount rates for all of our plans using high-quality AA rated corporate bond yields with terms matching the plans' specific cash flows.

Additional information regarding our accounting for pension and other employee future benefits is included in Note 21.

Impairment of Securities

We review other securities at each quarter-end reporting period to identify and evaluate investments that show indications of possible impairment. For these equity securities, a significant or prolonged decline in the fair value of a security below its cost is objective evidence of impairment.

Debt securities measured at amortized cost or FVOCI are assessed for impairment using the expected credit loss model. For securities determined to have low credit risk, the allowance for credit losses is measured at a 12-month expected credit loss.

Additional information regarding our accounting for debt securities measured at amortized cost or FVOCI and other securities, allowance for credit losses and the determination of fair value is included in Notes 3 and 17.

Income Taxes and Deferred Tax Assets

The provision for income taxes is calculated based on the expected tax treatment of transactions recorded in either our Consolidated Statement of Income or Consolidated Statement of Changes in Equity. In determining the provision for income taxes, we interpret tax legislation, case law and administrative positions in numerous jurisdictions and, based on our judgment, record our estimate of the amount required to settle tax obligations. We also make assumptions about the expected timing of the reversal of deferred tax assets and liabilities. If our interpretations and assumptions differ from those of tax authorities or if the timing of reversals is not as expected, our provision for income taxes could increase or decrease in future periods. The amount of any such increase or decrease cannot be reasonably estimated.

Deferred tax assets are recognized only when it is probable that sufficient taxable profit will be available in future periods against which deductible temporary differences or unused tax losses and tax credits may be utilized. We are required to assess whether it is probable that our deferred income tax assets will be realized. The factors used to assess the probability of realization are our past experience of income and capital gains, our forecast of future net income before taxes, and the remaining expiration period of tax loss carryforwards and tax credits. Changes in our assessment of these factors could increase or decrease our provision for income taxes in future periods.

Additional information regarding our accounting for income taxes is included in Note 22.

Goodwill and Intangible Assets

For the purpose of impairment testing, goodwill is allocated to our groups of cash-generating units ("CGUs"), which represent the lowest level within the bank at which goodwill is monitored for internal management purposes. Impairment testing is performed at least annually, by comparing the carrying values and the recoverable amounts of the CGUs to which goodwill has been allocated to determine whether the recoverable amount of each group is greater than its carrying value. If the carrying value of the group were to exceed its recoverable amount, an impairment calculation would be performed. The recoverable amount of a CGU is the higher of its fair value less costs to sell and value in use.

In determining fair value less costs to sell, we employ a discounted cash flow model consistent with those used when we acquire businesses. This model is dependent on assumptions related to revenue growth, discount rates, synergies achieved on acquisition and the availability of comparable acquisition data. Changes in any of these assumptions would affect the determination of fair value for each of the business units in a different manner. Management must exercise judgment and make assumptions in determining fair value less costs to sell, and differences in judgment and assumptions could affect the determination of fair value and any resulting impairment write-down.

Intangible assets with a definite life are amortized to income on either a straight-line or an accelerated basis over a period not exceeding 15 years, depending on the nature of the asset. We test definite-life intangible assets for impairment when circumstances indicate the carrying value may not be recoverable. Indefinite-life intangible assets are tested annually for impairment. If any intangible assets are determined to be impaired, we write them down to their recoverable amount, the higher of value in use and fair value less costs to sell, when this is less than the carrying value.

Additional information regarding goodwill and intangible assets is included in Note 11.

Insurance-Related Liabilities

Insurance claims and policy benefit liabilities represent current claims and estimates of future insurance policy benefit liabilities. Liabilities for life insurance contracts are determined using the Canadian Asset Liability Method, which incorporates best-estimate assumptions for mortality, morbidity, policy lapses, surrenders, future investment yields, policy dividends, administration costs and margins for adverse deviation. These assumptions are reviewed at least annually and updated to reflect actual experience and market conditions. The most significant impact on the valuation of a liability would result from a change in the assumption for future investment yields.

Additional information regarding insurance-related liabilities is included in Note 14.

Provisions

A provision, including for restructuring, is recognized if, as a result of a past event, the bank has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are recorded at the best estimate of the amounts required to settle the obligation as at the balance sheet date, taking into account the risks and uncertainties associated with the obligation. Management and external experts are involved in estimating any provision, as necessary. The actual costs of settling some obligations may be substantially higher or lower than the amounts of the provisions.

Additional information regarding provisions is included in Note 24.

Transfer of Financial Assets and Consolidation of Structured Entities

We enter into transactions in which we transfer assets, typically mortgage loans and credit card loans, to a structured entity or third party to obtain alternate sources of funding. We assess whether substantially all of the risks and rewards of or control over the loans have been transferred to determine if they qualify for derecognition. Since we continue to be exposed to substantially all of the repayment, interest rate and/or credit risk associated with the securitized loans, they do not qualify for derecognition. We continue to recognize the loans and the related cash proceeds as secured financings in our Consolidated Balance Sheet.

For securitization vehicles sponsored by the bank, the vehicles typically have limited decision-making authority. The structure of these vehicles limits the activities they can undertake, the types of assets they can hold and how activities are funded. We control and consolidate these vehicles when we have the key decision-making powers necessary to obtain the majority of the benefits of their activities.

For certain investments in limited partnerships, we exercise judgment in determining whether we control an entity. Based on an assessment of our interests and rights, we have determined that we do not control certain entities, even though we may have an ownership interest greater than 50%. This may be the case when we are not the general partner in an arrangement and the general partner's rights most significantly affect the returns of the entity. Additionally, we have determined that we control certain entities despite having an ownership interest less than 50%. This may be the case when we are the general partner in an arrangement and the general partner's rights most significantly affect the returns of the entity.

Transferred assets are discussed in greater detail in Note 6 and structured entities are discussed in greater detail in Notes 7 and 20.

Future Changes in IFRS*Leases*

In January 2016, the IASB issued IFRS 16 *Leases* ("IFRS 16"), which provides guidance whereby for most leases, lessees will recognize a liability for the present value of future lease payments and record a corresponding asset on the balance sheet. There are minimal changes to lessor accounting. IFRS 16 is effective for our fiscal year beginning November 1, 2019.

The main impact for the bank will be recording real estate leases on the balance sheet. Currently, most of our real estate leases are classified as operating leases, whereby we record lease expense over the lease term with no asset or liability recorded on the balance sheet other than any related leasehold improvements. Under IFRS 16, we will recognize right-of-use assets, which will depreciate, and lease liabilities, which will accrete interest, over the lease term.

On transition, we will recalculate the right-of-use asset as if we had always applied IFRS 16 for a selection of leases, and for the remaining leases, we will set the right-of-use asset equal to the lease liability. We will continue to account for low-dollar-value leases as executory contracts, with lease expense recorded over the lease term and no corresponding right-of-use asset or lease liability for certain types of leases. In addition, we have elected to exclude intangibles from the scope of lease accounting, and we will combine lease and non-lease components (for example, maintenance and utilities that have fixed payments) in the calculation of right-of-use assets and lease liabilities.

When we adopt IFRS 16, we will recognize the cumulative effect of any changes in opening retained earnings with no changes to prior years. The impact will be an increase in assets of approximately \$2.0 billion, an increase in liabilities of approximately \$2.1 billion, a decrease in equity of approximately \$100 million (\$75 million after tax) and a decrease in our CET1 capital ratio by up to approximately 10 bps.

Uncertainty Over Income Tax Treatments

On June 7, 2017, the IASB issued IFRIC Interpretation 23 *Uncertainty over Income Tax Treatments*, effective for the bank beginning November 1, 2019. The Interpretation clarifies the recognition and measurement requirements in IAS 12 *Income Taxes* when there is uncertainty over income tax treatments. We do not expect the Interpretation to have a significant impact on our financial results.

Interbank Offered Rate ("IBOR") Reform

The IASB published Phase 1 of its amendments to IFRS 9 *Financial Instruments* and IAS 39 *Financial Instruments: Recognition and Measurement*, as well as IFRS 7 *Financial Instruments: Disclosures* in September 2019, to provide relief from the potential effects of the uncertainty arising from Interbank Offered Rate (IBOR) reform, focusing in particular on the period prior to replacement of interbank offered rates. These amendments modify hedge accounting requirements, allowing us to assume that the interest rate benchmark on which the cash flows of the hedged item and the hedging instrument are based are not altered as a result of IBOR reform, thereby allowing hedge accounting to continue. Mandatory application of the amendments ends at the earlier of when the uncertainty regarding the timing and amount of interest rate benchmark-based cash flows is no longer present and the discontinuation of the hedging relationship. Phase 2 of the IASB's project on IBOR is underway and will address transition to IBOR.

The Phase 1 amendments are effective for our fiscal year beginning November 1, 2020, with early adoption permitted. We are in the process of assessing our inventory of IBOR-based instruments and related hedge accounting relationships to evaluate the impact of these amendments on our financial results. We provide disclosure on our current hedging relationships in Note 8.

Insurance Contracts

In May 2017, the IASB issued IFRS 17 *Insurance Contracts* ("IFRS 17"), which provides a comprehensive approach to accounting for all types of insurance contracts and will replace the existing IFRS 4 *Insurance Contracts*. In June 2019, the IASB published an Exposure Draft which proposes to defer the effective date by one year, which would change the anticipated effective date for the bank to November 1, 2022. We will continue to closely monitor the ongoing developments related to the standard. In order to meet the requirements of IFRS 17, we have established a project and are currently assessing the impact of the standard on our future financial results.

Conceptual Framework

In March 2018, the IASB issued the revised Conceptual Framework ("Framework"), which sets out the fundamental concepts for financial reporting to ensure consistency in standard-setting decisions and that similar transactions are treated in a similar way, so as to provide useful information to users of financial statements. The revised Framework, which is effective for our fiscal year beginning November 1, 2020, will inform future standard-setting decisions but does not impact existing IFRS. We do not expect the Framework to have a significant impact on our accounting policies.

Note 2: Cash and Interest Bearing Deposits with Banks

(Canadian \$ in millions)	2019	2018
Cash and deposits with banks (1)	47,598	40,738
Cheques and other items in transit, net	1,205	1,404
Total cash and cash equivalents	48,803	42,142

(1) Includes deposits with the Bank of Canada, the U.S. Federal Reserve and other central banks.

Cheques and Other Items in Transit, Net

Cheques and other items in transit are recorded at cost and represent the net position of the uncleared cheques and other items in transit between us and other banks.

Cash Restrictions

Certain of our foreign operations are required to maintain reserves or minimum balances with central banks in their respective countries of operation, totalling \$1,896 million as at October 31, 2019 (\$1,655 million in 2018).

Interest Bearing Deposits with Banks

Deposits with banks are recorded at amortized cost and include acceptances we have purchased that were issued by other banks. Interest income earned on these deposits is recorded on an accrual basis.

Note 3: Securities

Securities are divided into six types, each with a different purpose and accounting treatment. The types of securities we hold are as follows:

Trading securities are securities purchased for resale over a short period of time. Trading securities are recorded at fair value through profit or loss. Transaction costs and changes in fair value are recorded in our Consolidated Statement of Income in trading revenues.

Fair value through profit or loss securities are measured at fair value, with changes in fair value and related transaction costs recorded in our Consolidated Statement of Income in securities gains, other than trading, except as noted below. This category includes the following:

Securities Designated at FVTPL

In order to qualify for this designation, the security must have reliably measurable fair values, and the designation eliminates or significantly reduces the inconsistent treatment that would otherwise arise from measuring the gains and losses on a different basis. Securities must be designated on initial recognition, and the designation is irrevocable. If these securities were not designated at FVTPL, they would be accounted for at either FVOCI or amortized cost.

We designate certain securities held by our insurance subsidiaries that support our insurance liabilities at fair value through profit or loss, since the actuarial calculation of insurance liabilities is based on the fair value of the investments supporting them. This designation aligns the accounting result with the way the portfolio is managed on a fair value basis. The change in fair value of the securities is recorded in non-interest revenue, insurance revenue, and the change in fair value of the liabilities is recorded in insurance claims, commissions and changes in policy benefit liabilities. The fair value of these investments of \$10,805 million as at October 31, 2019 (\$8,783 million as at October 31, 2018) is recorded in securities in our Consolidated Balance Sheet. The impact of recording these investments at fair value through profit or loss was an increase of \$1,006 million in non-interest revenue, insurance revenue, for the year ended October 31, 2019 (decrease of \$372 million for the year ended October 31, 2018).

Securities Mandatorily Measured at FVTPL

Securities managed on a fair value basis, but not held for trading, or debt securities with cash flows that do not represent solely payments of principal and interest and equity securities not held for trading or designated at FVOCI are classified as FVTPL.

The bank's FVTPL securities of \$13,704 million as at October 31, 2019 (\$11,611 million as at October 31, 2018) include \$2,899 million of securities mandatorily measured at fair value as at October 31, 2019 (\$2,828 million as at October 31, 2018).

Debt securities at amortized cost are debt securities purchased with the objective of collecting contractual cash flows, and those cash flows represent solely payments of principal and interest. These securities are initially recorded at fair value plus transaction costs and are subsequently measured at amortized cost using the effective interest method. Impairment losses (recoveries) are recorded in our Consolidated Statement of Income in securities gains, other than trading. Interest income earned and amortization of premiums, discounts and transaction costs are recorded in our Consolidated Statement of Income in interest, dividend and fee income, securities.

Debt securities at FVOCI are debt securities purchased with the objective of both collecting contractual cash flows and selling the securities. The securities' cash flows represent solely payments of principal and interest. These securities may be sold in response to or in anticipation of changes in interest rates and any resulting prepayment risk, changes in credit risk, changes in foreign currency risk or changes in funding sources or terms, or in order to meet liquidity needs.

Debt securities measured at FVOCI are initially recorded at fair value plus transaction costs. They are subsequently measured at fair value, with unrealized gains and losses recorded in our Consolidated Statement of Comprehensive Income until the security is sold or impaired. Gains and losses on disposal and impairment losses (recoveries) are recorded in our Consolidated Statement of Income in non-interest revenue, securities gains, other than trading. Interest income earned is recorded in our Consolidated Statement of Income in interest, dividend and fee income, securities, using the effective interest method.

Equity securities at FVOCI are equity securities for which we have elected to record changes in the fair value of the instrument in other comprehensive income as opposed to fair value through profit or loss. Gains or losses recorded on these instruments will never be recognized in profit or loss. Equity securities measured at FVOCI are not subject to an impairment assessment.

Other securities are investments in associates and joint ventures. Investments in associates are where we exert significant influence over operating and financing decisions (generally companies in which we own between 20% and 50% of the voting shares). These are accounted for using the equity method of accounting. The equity method is also applied to our interests in joint ventures over which we have joint control. Our share of the net income or loss is recorded in investments in associates and joint ventures in our Consolidated Statement of Income. Any other comprehensive income amounts are reflected in the relevant sections of our Consolidated Statement of Comprehensive Income.

We account for all of our securities transactions using settlement date accounting in our Consolidated Balance Sheet. Changes in fair value between the trade date and settlement date are recorded in net income, except for those related to securities measured at FVOCI, which are recorded in other comprehensive income.

Impairment Review

Debt securities at amortized cost or FVOCI are assessed for impairment using the ECL model, with the exception of securities determined to have low credit risk, where the allowance for credit losses is measured at a 12 month expected credit loss. A financial asset is considered to have low credit risk if the financial asset has a low risk of default, the borrower has a strong capacity to meet its contractual cash flow obligations in the near term and adverse changes in economic and business conditions in the longer term may, but will not necessarily, reduce the ability of the borrower to fulfill its contractual cash flow obligations.

Debt securities at amortized cost totalling \$24,472 million as at October 31, 2019 (\$6,485 million as at October 31, 2018) are net of allowances for credit losses of \$1 million as at October 31, 2019 (\$1 million as at October 31, 2018).

Debt securities at FVOCI totalling \$64,434 million as at October 31, 2019 (\$62,378 million as at October 31, 2018) are net of allowances for credit losses of \$2 million as at October 31, 2019 (\$2 million as at October 31, 2018).

Equity securities at FVOCI totalling \$81 million as at October 31, 2019 (\$62 million as at October 31, 2018) are not subject to an impairment assessment.

Fair Value Measurement

For traded securities, quoted market value is considered to be fair value. Quoted market value is based on bid or ask prices, depending on which is the most appropriate to measure fair value. Where market quotes are not available, we use estimation techniques to determine fair value. Additional information regarding fair value measurement techniques is included in Note 17.

Remaining Term to Maturity of Securities

	Term to maturity					No maturity	2019	2018
	Within 1 year	1 to 3 years	3 to 5 years	5 to 10 years	Over 10 years		Total	Total
Trading Securities								
Issued or guaranteed by:								
Canadian federal government	1,860	3,302	1,414	829	925	-	8,330	10,320
Canadian provincial and municipal governments	921	1,122	735	1,170	3,579	-	7,527	8,702
U.S. federal government	859	3,677	2,432	1,620	175	-	8,763	9,517
U.S. states, municipalities and agencies	232	124	52	195	71	-	674	1,216
Other governments	437	719	296	133	-	-	1,585	1,412
NHA MBS, U.S. agency MBS and CMO (1)	226	171	208	203	10,238	-	11,046	9,184
Corporate debt	1,293	1,613	1,408	1,297	2,107	-	7,718	9,198
Trading loans	7	31	41	24	-	-	103	199
Corporate equity	-	-	-	-	-	40,157	40,157	49,949
Total trading securities	5,835	10,759	6,586	5,471	17,095	40,157	85,903	99,697
FVTPL Securities								
Issued or guaranteed by:								
Canadian federal government	392	4	2	3	116	-	517	431
Canadian provincial and municipal governments	12	10	5	53	1,199	-	1,279	946
U.S. federal government	48	-	-	-	-	-	48	69
Other governments	-	-	49	-	-	-	49	-
NHA MBS, U.S. agency MBS and CMO (1)	-	5	-	-	-	-	5	7
Corporate debt	578	71	128	1,083	6,357	-	8,217	6,820
Corporate equity	-	-	-	-	-	3,589	3,589	3,338
Total FVTPL securities	1,030	90	184	1,139	7,672	3,589	13,704	11,611
FVOCI Securities								
Issued or guaranteed by:								
Canadian federal government								
Amortized cost	5,618	2,090	3,059	1,109	-	-	11,876	12,884
Fair value	5,617	2,098	3,106	1,123	-	-	11,944	12,805
Yield (%)	1.60	1.48	2.01	1.97	-	-	1.72	1.64
Canadian provincial and municipal governments								
Amortized cost	1,406	1,720	2,428	353	-	-	5,907	6,896
Fair value	1,406	1,740	2,503	363	-	-	6,012	6,862
Yield (%)	1.67	2.32	2.63	3.05	-	-	2.34	1.90
U.S. federal government								
Amortized cost	5	3,770	5,095	6,493	-	-	15,363	17,403
Fair value	8	3,820	5,222	6,925	-	-	15,975	16,823
Yield (%)	1.90	2.23	2.15	2.74	-	-	2.42	2.22
U.S. states, municipalities and agencies								
Amortized cost	389	703	961	1,036	1,002	-	4,091	3,694
Fair value	389	709	991	1,065	1,007	-	4,161	3,655
Yield (%)	1.93	2.21	2.57	2.67	3.00	-	2.58	2.42
Other governments								
Amortized cost	947	2,691	3,466	75	-	-	7,179	4,818
Fair value	951	2,727	3,582	75	-	-	7,335	4,790
Yield (%)	1.27	2.53	2.56	3.17	-	-	2.38	2.39
NHA MBS (1)								
Amortized cost	29	409	1,515	-	-	-	1,953	2,382
Fair value	30	411	1,529	-	-	-	1,970	2,370
Yield (%)	2.13	1.71	2.31	-	-	-	2.18	1.98
U.S. agency MBS and CMO (1)								
Amortized cost	12	58	146	2,361	9,389	-	11,966	11,811
Fair value	13	58	150	2,416	9,393	-	12,030	11,317
Yield (%)	2.16	2.28	2.95	2.81	1.96	-	2.14	2.33
Corporate debt								
Amortized cost	1,196	2,336	1,312	35	20	-	4,899	3,783
Fair value	1,197	2,378	1,374	37	21	-	5,007	3,756
Yield (%)	1.28	2.76	3.06	3.09	3.32	-	2.48	2.67
Corporate equity								
Cost	-	-	-	-	-	79	79	62
Fair value	-	-	-	-	-	81	81	62
Total cost or amortized cost	9,602	13,777	17,982	11,462	10,411	79	63,313	63,733
Total fair value	9,611	13,941	18,457	12,004	10,421	81	64,515	62,440
Yield (%)	1.55	2.26	2.38	2.69	2.06	-	2.23	2.13
Amortized Cost Securities								
Issued or guaranteed by:								
Canadian federal government								
Amortized cost	-	701	3,018	813	-	-	4,532	-
Fair value	-	701	3,021	812	-	-	4,534	-
Canadian provincial and municipal governments								
Amortized cost	290	399	1,460	1,404	-	-	3,553	832
Fair value	291	399	1,481	1,405	-	-	3,576	841
U.S. federal government								
Amortized cost	-	2,236	1,339	2,638	-	-	6,213	-
Fair value	-	2,245	1,339	2,630	-	-	6,214	-
Other governments								
Amortized cost	3	667	334	45	-	-	1,049	10
Fair value	3	667	334	45	-	-	1,049	10
NHA MBS, U.S. agency MBS and CMO (1)								
Amortized cost	131	366	642	2,073	5,062	-	8,274	5,552
Fair value	131	368	654	2,116	5,129	-	8,398	5,346
Corporate debt								
Amortized cost	175	306	201	110	59	-	851	91
Fair value	175	305	202	110	59	-	851	91
Total cost or amortized cost	599	4,675	6,994	7,083	5,121	-	24,472	6,485
Total fair value	600	4,685	7,031	7,118	5,188	-	24,622	6,288
Other Securities								
Carrying value	-	-	-	-	-	844	844	702
Total carrying value or amortized cost of securities	17,066	29,301	31,746	25,155	40,299	44,669	188,236	182,228
Total value of securities	17,075	29,465	32,221	25,697	40,309	44,671	189,438	180,935
Total by Currency (in Canadian \$ equivalent)								
Canadian dollar	13,507	10,843	13,417	7,314	14,102	26,722	85,905	82,767
U.S. dollar	2,691	18,392	18,656	18,373	26,204	16,257	100,573	96,266
Other currencies	877	230	148	10	3	1,692	2,960	1,902
Total securities	17,075	29,465	32,221	25,697	40,309	44,671	189,438	180,935

(1) These amounts are supported by insured mortgages or issued by U.S. agencies and government-sponsored enterprises. NHA refers to the National Housing Act, MBS refers to mortgage-backed securities and CMO refers to collateralized mortgage obligations.

Yields in the table above are calculated using the cost of the security and the contractual interest rate associated with each security, adjusted for any amortization of premiums and discounts. Tax effects are not taken into consideration. The term to maturity included in the table above is based on the contractual maturity date of the security. Actual maturities could differ, as issuers may have the right to call or prepay obligations.

Unrealized Gains and Losses on FVOCI Securities

The following table summarizes the unrealized gains and losses:

(Canadian \$ in millions)	2019				2018			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Fair value
Issued or guaranteed by:								
Canadian federal government	11,876	72	4	11,944	12,884	1	80	12,805
Canadian provincial and municipal governments	5,907	106	1	6,012	6,896	8	42	6,862
U.S. federal government	15,363	617	5	15,975	17,403	4	584	16,823
U.S. states, municipalities and agencies	4,091	74	4	4,161	3,694	16	55	3,655
Other governments	7,179	158	2	7,335	4,818	2	30	4,790
NHA MBS	1,953	18	1	1,970	2,382	6	18	2,370
U.S. agency MBS and CMO	11,966	106	42	12,030	11,811	2	496	11,317
Corporate debt	4,899	110	2	5,007	3,783	6	33	3,756
Corporate equity	79	2	-	81	62	-	-	62
Total	63,313	1,263	61	64,515	63,733	45	1,338	62,440

Unrealized gains (losses) may be offset by related (losses) gains on hedge contracts.

Interest, Dividend and Fee Income

Interest, dividend and fee income has been included in our Consolidated Statement of Income as follows, excluding other securities and trading securities. Related income for trading securities is included under Trading-Related Revenue in Note 17.

(Canadian \$ in millions)	2019	2018	2017
FVTPL	34	16	na
FVOCI	1,585	1,118	na
Amortized cost	268	172	na
Available-for-sale securities	na	na	662
Held-to-maturity securities	na	na	150
Total	1,887	1,306	812

na - not applicable due to IFRS 9 adoption.

Non-Interest Revenue

Net gains and losses from securities, excluding net realized and unrealized gains on trading securities, have been included in our Consolidated Statement of Income as follows:

(Canadian \$ in millions)	2019	2018	2017
Non-Interest Revenue			
FVTPL securities	164	93	na
FVOCI securities (1)			
Gross realized gains	209	363	228
Gross realized (losses)	(123)	(216)	(99)
Other securities, net realized and unrealized gains	-	-	49
Impairment losses	(1)	(1)	(7)
Securities gains, other than trading (2)	249	239	171

(1) Realized gains (losses) are net of unrealized gains (losses) on related hedge contracts. Fiscal 2017 represents available-for-sale securities.

(2) The following amounts of income related to our insurance operations were included in non-interest revenue, insurance revenue, in our Consolidated Statement of Income: Interest, dividend and fee income of \$407 million for the year ended October 31, 2019 (\$354 million in 2018); and securities gains, other than trading, of \$11 million for the year ended October 31, 2019 (\$1 million in 2018).

Unrealized gains and losses on trading securities are included in trading-related revenue in Note 17.

na - not applicable due to IFRS 9 adoption.

Certain comparative figures have been reclassified to conform with the current year's presentation.

Note 4: Loans and Allowance for Credit Losses

Loans are initially measured at fair value plus directly attributable costs, and are subsequently measured at amortized cost using the effective interest method where the cash flows of those loans represent solely payments of principal and interest, otherwise those loans are measured at FVTPL. The effective interest method allocates interest income over the expected term of the loan by applying the effective interest rate to the carrying amount of the loan. The effective interest rate is defined as the rate that exactly discounts estimated future cash receipts through the expected term of the loan to the net carrying amount of the loan. Under the effective interest method, the amount recognized in interest, dividend and fee income, loans, varies over the term of the loan based on the principal outstanding. The treatment of interest income for impaired loans is described below.

Securities Borrowed or Purchased Under Resale Agreements

Securities borrowed or purchased under resale agreements represent the amounts we will receive as a result of our commitment to return or resell securities that we have borrowed or purchased, back to the original lender or seller, on a specified date at a specified price. We account for these instruments as if they were loans.

Lending Fees

Lending fees arise in Personal and Commercial Banking and Capital Markets. The accounting treatment for lending fees varies depending on the transaction. Some loan origination, restructuring and renegotiation fees are recorded as interest income over the term of the loan, while other lending fees are taken into income at the time of loan origination. Commitment fees are calculated as a percentage of the facility balance at the end of the period. The fees are recorded as interest income over the term of the loan, unless we believe the loan commitment will not be used. In the latter case, commitment fees are recorded as lending fees earned over the commitment period. Loan syndication fees are payable and included in lending fees at the time the syndication is completed, unless the yield on any loans we retain is less than that of other comparable lenders involved in the financing. In the latter case, an appropriate portion of the syndication fee is recorded as interest income over the term of the loan.

Impaired Loans

We classify a loan as impaired (Stage 3) when one or more loss events have occurred, such as bankruptcy, default or delinquency. Generally, consumer loans in both Canada and the U.S. are classified as impaired when payment is contractually 90 days past due, or one year past due for residential mortgages if guaranteed by the Government of Canada. Credit card loans are immediately written off when principal or interest payments are 180 days past due, and are not reported as impaired. In Canada, consumer instalment loans, other personal loans and some small business loans are normally written off when they are one year past due. In the U.S., all consumer loans are generally written off when they are 180 days past due, except for non-real estate term loans, which are generally written off when they are 120 days past due. For the purpose of measuring the amount to be written off, the determination of the recoverable amount includes an estimate of future recoveries.

Corporate and commercial loans are classified as impaired when we determine there is no longer reasonable assurance that principal or interest will be collected in their entirety on a timely basis. Generally, we consider corporate and commercial loans to be impaired when payments are 90 days past due. Corporate and commercial loans are written off following a review on an individual loan basis that confirms all recovery attempts have been exhausted.

A loan will be reclassified to performing status when we determine that there is reasonable assurance of full and timely repayment of interest and principal in accordance with the terms and conditions of the loan, and that none of the criteria for classification of the loan as impaired continue to apply.

Loans are in default when the borrower is unlikely to pay its credit obligations in full without recourse by the bank, such as realizing security, or when the borrower's payments are past due more than 90 days (180 days for credit card loans). Overdrafts are considered to be past due once the customer has breached an advised limit or has been advised of a limit smaller than currently outstanding or, in the case of retail overdrafts, has not brought the overdraft down to a \$nil balance within a specified time period.

Our average gross impaired loans were \$2,285 million for the year ended October 31, 2019 (\$2,115 million in 2018). Our average impaired loans, net of the specific allowance, were \$1,864 million for the year ended October 31, 2019 (\$1,706 million in 2018).

Once a loan is identified as impaired, we continue to recognize interest income based on the original effective interest rate on the loan amount net of its related allowance. In the periods following the recognition of impairment, adjustments to the allowance for these loans reflecting the time value of money are recognized as interest income. Interest income on impaired loans of \$80 million was recognized for the year ended October 31, 2019 (\$67 million in 2018 and \$75 million in 2017).

During the year ended October 31, 2019, we recorded a net gain of \$11 million before tax (\$4 million in 2018 and \$28 million in 2017) on the sale of impaired and written-off loans.

Allowance for Credit Losses ("ACL")

The allowance for credit losses recorded in our Consolidated Balance Sheet is maintained at a level that we consider adequate to absorb credit-related losses on our loans and other credit instruments. The allowance for credit losses amounted to \$2,094 million as at October 31, 2019 (\$1,870 million in 2018), of which \$1,850 million (\$1,639 million in 2018) was recorded in loans and \$244 million (\$231 million in 2018) was recorded in other liabilities in our Consolidated Balance Sheet.

Significant changes in the gross balances, including originations, maturities and repayments in the normal course of operations, impact the allowance for credit losses.

Allowance on Performing Loans

We maintain an allowance in order to cover impairment in the existing portfolio for loans that have not yet been individually identified as impaired. Our approach to establishing and maintaining the allowance on performing loans is based on the requirements of IFRS, considering guidelines issued by OSFI.

Under the IFRS 9 ECL methodology, an allowance is recorded for expected credit losses on financial assets regardless of whether there has been an actual impairment. We recognize a loss allowance at an amount generally equal to 12 month expected credit losses, if the credit risk at the reporting date has not increased significantly since initial recognition (Stage 1). We will record expected credit losses over the remaining life of performing financial assets which are considered to have experienced a significant increase in credit risk (Stage 2).

The determination of a significant increase in credit risk takes into account many different factors and varies by product and risk segment. The main factors considered in making this determination are relative changes in probability-weighted probability of default ("PD") since origination and certain other criteria, such as 30-day past due and watchlist status.

For each exposure, ECL is a function of the PD, exposure at default ("EAD") and loss given default ("LGD"), with the timing of the loss also considered, and is estimated by incorporating forward-looking economic information and through the use of experienced credit judgment to reflect factors not captured in ECL models.

PD represents the likelihood that a loan will not be repaid and will go into default in either a 12 month horizon for Stage 1 or a lifetime horizon for Stage 2. The PD for each individual instrument is modelled based on historical data and is estimated based on current market conditions and reasonable and supportable information about future economic conditions.

EAD is modelled based on historical data and represents an estimate of the outstanding amount of credit exposure at the time a default may occur. For off-balance sheet and undrawn amounts, EAD includes an estimate of any further amounts to be drawn at the time of default.

LGD is the amount that may not be recovered in the event of default and is modelled based on historical data and reasonable and supportable information about future economic conditions, where appropriate. LGD takes into consideration the amount and quality of any collateral held.

We consider past events, current market conditions and reasonable forward-looking supportable information about future economic conditions in calculating the amount of expected losses. In assessing information about possible future economic conditions, we utilize multiple economic scenarios, including our base case, which represents, in our view, the most probable outcome, as well as benign and adverse forecasts, all of which are developed by our Economics group. Key economic variables used in the determination of the allowance for credit losses reflect the geographic diversity of our portfolios, where appropriate.

In considering the lifetime of a loan, the contractual period of the loan, including prepayment, extension and other options, is generally used. For revolving instruments, such as credit cards, which may not have a defined contractual period, the lifetime is based on historical behaviour.

Our ECL methodology also requires the use of experienced credit judgment to incorporate the estimated impact of factors that are not captured in the modelled ECL results.

Allowance on Impaired Loans

We maintain an allowance on individually identified impaired loans (Stage 3) of \$463 million as at October 31, 2019 (\$370 million as at October 31, 2018) on our gross impaired loans of \$2,629 million as at October 31, 2019 (\$1,936 million as at October 31, 2018), to reduce their carrying value to an expected recoverable amount of \$2,166 million as at October 31, 2019 (\$1,566 million as at October 31, 2018).

We review our loans on an ongoing basis to assess whether any loans should be classified as impaired and whether an allowance or write-off should be recorded (excluding credit card loans, which are classified as impaired and written off when principal or interest payments are 180 days past due). The review of individually significant problem loans is conducted at least quarterly by the account managers, each of whom assesses the ultimate collectability and estimated recoveries for a specific loan based on all events and conditions that are relevant to the loan. This assessment is then reviewed and approved by an independent credit officer.

Individually Significant Impaired Loans

To determine the amount we expect to recover from an individually significant impaired loan, we use the value of the estimated future cash flows discounted at the loan's original effective interest rate. The determination of estimated future cash flows of a collateralized impaired loan reflects the expected realization of the underlying security, net of expected costs and any amounts legally required to be paid to the borrower. Security can vary by type of loan and may include cash, securities, real estate properties, accounts receivable, guarantees, inventory or other capital assets.

Individually Insignificant Impaired Loans

Residential mortgages and consumer instalment and other personal loans are individually insignificant and may be assessed individually or collectively for losses at the time of impairment, taking into account historical loss experience and expectations of future economic conditions. Collectively assessed loans are grouped together by similar risk characteristics, such as type of instrument, geographic location, industry, type of collateral and term to maturity.

Loans: Credit Risk Exposure

The following tables set out our credit risk exposure for all loans carried at amortized cost, FVOCI or FVTPL as at October 31, 2019 and October 31, 2018. Stage 1 represents those performing loans carried with up to a 12 month expected credit loss, Stage 2 represents those performing loans carried with a lifetime expected credit loss, and Stage 3 represents those loans with a lifetime credit loss that are credit impaired.

(Canadian \$ in millions)	October 31, 2019			
	Stage 1	Stage 2	Stage 3	Total
Loans: Residential mortgages				
Exceptionally low	-	-	-	-
Very low	79,011	242	-	79,253
Low	20,853	2,821	-	23,674
Medium	13,651	4,578	-	18,229
High	124	397	-	521
Not rated	1,531	118	-	1,649
Impaired	-	-	414	414
Allowance for credit losses	15	32	17	64
Carrying amount	115,155	8,124	397	123,676
Loans: Consumer instalment and other personal				
Exceptionally low	21,023	25	-	21,048
Very low	16,491	194	-	16,685
Low	9,894	346	-	10,240
Medium	10,510	4,264	-	14,774
High	397	1,423	-	1,820
Not rated	2,594	107	-	2,701
Impaired	-	-	468	468
Allowance for credit losses	82	318	136	536
Carrying amount	60,827	6,041	332	67,200
Loans: Credit cards				
Exceptionally low	2,418	-	-	2,418
Very low	1,214	16	-	1,230
Low	970	158	-	1,128
Medium	2,020	876	-	2,896
High	140	440	-	580
Not rated	606	1	-	607
Impaired	-	-	-	-
Allowance for credit losses	43	193	-	236
Carrying amount	7,325	1,298	-	8,623
Loans: Business and government (1)				
Acceptable				
Investment grade	134,587	1,028	-	135,615
Sub-investment grade	96,731	11,553	-	108,284
Watchlist	-	5,556	-	5,556
Impaired	-	-	1,747	1,747
Allowance for credit losses	263	441	310	1,014
Carrying amount	231,055	17,696	1,437	250,188
Commitments and financial guarantee contracts				
Acceptable				
Investment grade	134,920	884	-	135,804
Sub-investment grade	45,178	6,435	-	51,613
Watchlist	-	2,133	-	2,133
Impaired	-	-	324	324
Allowance for credit losses	119	103	22	244
Carrying amount (2)	179,979	9,349	302	189,630

(1) Includes customers' liability under acceptances.

(2) Represents the total contractual amounts of undrawn credit facilities and other off-balance sheet exposures, excluding personal lines of credit and credit cards that are unconditionally cancellable at our discretion.

(Canadian \$ in millions)

October 31, 2018

	Stage 1	Stage 2	Stage 3	Total
Loans: Residential mortgages				
Exceptionally low	-	-	-	-
Very low	76,314	125	-	76,439
Low	18,975	2,479	-	21,454
Medium	12,621	3,765	-	16,386
High	90	445	-	535
Not rated	4,250	181	-	4,431
Impaired	-	-	375	375
Allowance for credit losses	20	37	19	76
Carrying amount	112,230	6,958	356	119,544
Loans: Consumer instalment and other personal				
Exceptionally low	20,236	20	-	20,256
Very low	13,364	222	-	13,586
Low	12,581	364	-	12,945
Medium	7,707	4,153	-	11,860
High	357	1,427	-	1,784
Not rated	2,105	168	-	2,273
Impaired	-	-	521	521
Allowance for credit losses	83	312	143	538
Carrying amount	56,267	6,042	378	62,687
Loans: Credit cards				
Exceptionally low	2,403	4	-	2,407
Very low	1,140	11	-	1,151
Low	943	107	-	1,050
Medium	1,742	874	-	2,616
High	108	428	-	536
Not rated	568	1	-	569
Impaired	-	-	-	-
Allowance for credit losses	39	191	-	230
Carrying amount	6,865	1,234	-	8,099
Loans: Business and government (1)				
Acceptable				
Investment grade	109,774	2,148	-	111,922
Sub-investment grade	88,348	7,308	-	95,656
Watchlist	-	4,423	-	4,423
Impaired	-	-	1,040	1,040
Allowance for credit losses	232	355	208	795
Carrying amount	197,890	13,524	832	212,246
Commitments and financial guarantee contracts				
Acceptable				
Investment grade	116,108	1,722	-	117,830
Sub-investment grade	44,895	3,426	-	48,321
Watchlist	-	1,650	-	1,650
Impaired	-	-	242	242
Allowance for credit losses	108	96	27	231
Carrying amount (2)	160,895	6,702	215	167,812

(1) Includes customers' liability under acceptances.

(2) Represents the total contractual amounts of undrawn credit facilities and other off-balance sheet exposures, excluding personal lines of credit and credit cards that are unconditionally cancellable at our discretion.

Certain comparative figures have been reclassified to conform with the current year's presentation.

The following table shows the continuity in the loss allowance, by product type, for the year ended October 31, 2019:

(Canadian \$ in millions)				
For the year ended	Stage 1	Stage 2	Stage 3	Total
Loans: Residential mortgages				
Balance as at October 31, 2018	20	38	44	102
Transfer to Stage 1 (1)	27	(25)	(2)	-
Transfer to Stage 2 (1)	(2)	7	(5)	-
Transfer to Stage 3 (1)	-	(8)	8	-
Net remeasurement of loss allowance (2)	(35)	26	15	6
Loan originations	7	-	-	7
Derecognitions and maturities	(2)	(4)	-	(6)
Total provision for credit losses ("PCL") (3)	(5)	(4)	16	7
Write-offs (4)	-	-	(19)	(19)
Recoveries of previous write-offs	-	-	13	13
Foreign exchange and other	-	(1)	(16)	(17)
Balance as at October 31, 2019	15	33	38	86
Loans: Consumer instalment and other personal				
Balance as at October 31, 2018	90	326	144	560
Transfer to Stage 1 (1)	174	(161)	(13)	-
Transfer to Stage 2 (1)	(18)	85	(67)	-
Transfer to Stage 3 (1)	(5)	(109)	114	-
Net remeasurement of loss allowance (2)	(183)	232	167	216
Loan originations	48	-	-	48
Derecognitions and maturities	(16)	(40)	-	(56)
Total PCL (3)	-	7	201	208
Write-offs (4)	-	-	(306)	(306)
Recoveries of previous write-offs	-	-	118	118
Foreign exchange and other	(1)	-	(21)	(22)
Balance as at October 31, 2019	89	333	136	558
Loans: Credit cards				
Balance as at October 31, 2018	74	219	-	293
Transfer to Stage 1 (1)	107	(107)	-	-
Transfer to Stage 2 (1)	(21)	21	-	-
Transfer to Stage 3 (1)	(1)	(173)	174	-
Net remeasurement of loss allowance (2)	(96)	288	72	264
Loan originations	20	-	-	20
Derecognitions and maturities	(4)	(24)	-	(28)
Total PCL (3)	5	5	246	256
Write-offs (4)	-	-	(339)	(339)
Recoveries of previous write-offs	-	-	93	93
Foreign exchange and other	1	1	-	2
Balance as at October 31, 2019	80	225	-	305
Loans: Business and government				
Balance as at October 31, 2018	298	408	209	915
Transfer to Stage 1 (1)	201	(187)	(14)	-
Transfer to Stage 2 (1)	(50)	65	(15)	-
Transfer to Stage 3 (1)	(1)	(66)	67	-
Net remeasurement of loss allowance (2)	(214)	353	250	389
Loan originations	199	-	-	199
Derecognitions and maturities	(102)	(82)	-	(184)
Total PCL (3)	33	83	288	404
Write-offs (4)	-	-	(203)	(203)
Recoveries of previous write-offs	-	-	66	66
Foreign exchange and other	7	5	(49)	(37)
Balance as at October 31, 2019	338	496	311	1,145
Total as at October 31, 2019	522	1,087	485	2,094
Comprised of: Loans	403	984	463	1,850
Other credit instruments (5)	119	103	22	244

(1) Transfers represent the amount of ECL that moved between stages during the period, for example, moving from a 12-month (Stage 1) to lifetime (Stage 2) ECL measurement basis.

(2) Net remeasurements represent the ECL impact due to stage transfers, changes in economic forecasts and credit quality.

(3) Excludes PCL on other assets of \$(3) million.

(4) Generally, we continue to seek recovery on amounts that were written off during the year, unless the loan is sold, we no longer have the right to collect or we have exhausted all reasonable efforts to collect.

(5) Recorded in other liabilities on the Consolidated Balance Sheet.

The following table shows the continuity in the loss allowance, by product type, for the year ended October 31, 2018:

(Canadian \$ in millions)				
For the year ended	Stage 1	Stage 2	Stage 3	Total
Loans: Residential mortgages				
Balance as at November 1, 2017	16	34	49	99
Transfer to Stage 1 (1)	34	(31)	(3)	-
Transfer to Stage 2 (1)	(1)	7	(6)	-
Transfer to Stage 3 (1)	-	(9)	9	-
Net remeasurement of loss allowance (2)	(37)	42	19	24
Loan originations	10	-	-	10
Derecognitions and maturities	(2)	(6)	-	(8)
Total PCL (3)	4	3	19	26
Write-offs (4)	-	-	(20)	(20)
Recoveries of previous write-offs	-	-	7	7
Foreign exchange and other	-	1	(11)	(10)
Balance as at October 31, 2018	20	38	44	102
Loans: Consumer instalment and other personal				
Balance as at November 1, 2017	76	357	137	570
Transfer to Stage 1 (1)	214	(200)	(14)	-
Transfer to Stage 2 (1)	(22)	105	(83)	-
Transfer to Stage 3 (1)	(4)	(162)	166	-
Net remeasurement of loss allowance (2)	(196)	272	162	238
Loan originations	39	-	-	39
Derecognitions and maturities	(18)	(50)	-	(68)
Total PCL (3)	13	(35)	231	209
Write-offs (4)	-	-	(301)	(301)
Recoveries of previous write-offs	-	-	92	92
Foreign exchange and other	1	4	(15)	(10)
Balance as at October 31, 2018	90	326	144	560
Loans: Credit cards				
Balance as at November 1, 2017	83	254	-	337
Transfer to Stage 1 (1)	177	(177)	-	-
Transfer to Stage 2 (1)	(37)	37	-	-
Transfer to Stage 3 (1)	(1)	(195)	196	-
Net remeasurement of loss allowance (2)	(164)	342	20	198
Loan originations	19	-	-	19
Derecognitions and maturities	(3)	(42)	-	(45)
Total PCL (3)	(9)	(35)	216	172
Write-offs (4)	-	-	(319)	(319)
Recoveries of previous write-offs	-	-	103	103
Balance as at October 31, 2018	74	219	-	293
Loans: Business and government				
Balance as at November 1, 2017	268	410	234	912
Transfer to Stage 1 (1)	136	(128)	(8)	-
Transfer to Stage 2 (1)	(31)	66	(35)	-
Transfer to Stage 3 (1)	(1)	(61)	62	-
Net remeasurement of loss allowance (2)	(155)	203	215	263
Loan originations	163	-	-	163
Derecognitions and maturities	(80)	(86)	-	(166)
Model changes (5)	(7)	(3)	-	(10)
Total PCL (3)	25	(9)	234	250
Write-offs (4)	-	-	(297)	(297)
Recoveries of previous write-offs	-	-	59	59
Foreign exchange and other	5	7	(21)	(9)
Balance as at October 31, 2018	298	408	209	915
Total as at October 31, 2018	482	991	397	1,870
Comprised of: Loans	374	895	370	1,639
Other credit instruments (6)	108	96	27	231

(1) Transfers represent the amount of ECL that moved between stages during the period, for example, moving from a 12-month (Stage 1) to lifetime (Stage 2) ECL measurement basis.

(2) Net remeasurements represent the ECL impact due to stage transfers, changes in economic forecasts and credit quality.

(3) Excludes PCL on other assets of \$5 million.

(4) Generally, we continue to seek recovery on amounts that were written off during the year, unless the loan is sold, we no longer have the right to collect or we have exhausted all reasonable efforts to collect.

(5) Model changes represent calibration of models to forward-looking information and changes due to regulatory reform.

(6) Recorded in other liabilities on the Consolidated Balance Sheet.

Loans and allowance for credit losses by geographic region as at October 31, 2019 and 2018 are as follows:

(Canadian \$ in millions)	2019				2018			
	Gross amount	Allowance on impaired loans (2)	Allowance on performing loans (3)	Net amount	Gross amount	Allowance on impaired loans (2)	Allowance on performing loans (3)	Net amount
By geographic region: (1)								
Canada	258,842	207	740	257,895	243,261	189	689	242,383
United States	158,454	256	630	157,568	132,789	181	574	132,034
Other countries	10,648	-	17	10,631	9,580	-	6	9,574
Total	427,944	463	1,387	426,094	385,630	370	1,269	383,991

(1) Geographic region is based upon the country of ultimate risk.

(2) Excludes allowance for credit losses on impaired loans of \$22 million for other credit instruments, which is included in other liabilities (\$27 million in 2018).

(3) Excludes allowance for credit losses on performing loans of \$22 million for other credit instruments, which is included in other liabilities (\$204 million in 2018).

Certain comparative figures have been reclassified to conform with the current year's presentation.

Impaired (Stage 3) loans, including the related allowances, as at October 31, 2019 and 2018 are as follows:

(Canadian \$ in millions)	Gross impaired amount		Allowance on impaired loans (2)		Net impaired amount	
	2019	2018	2019	2018	2019	2018
Residential mortgages	414	375	17	19	397	356
Consumer instalment and other personal loans	468	521	136	143	332	378
Business and government loans	1,747	1,040	310	208	1,437	832
Total	2,629	1,936	463	370	2,166	1,566
By geographic region: (1)						
Canada	914	735	207	189	707	546
United States	1,715	1,201	256	181	1,459	1,020
Other countries	-	-	-	-	-	-
Total	2,629	1,936	463	370	2,166	1,566

(1) Geographic region is based upon the country of ultimate risk.

(2) Excludes allowance for credit losses on impaired loans of \$22 million for other credit instruments, which is included in other liabilities (\$27 million in 2018).

Fully secured loans with amounts past due between 90 and 180 days that we have not classified as impaired totalled \$54 million and \$49 million as at October 31, 2019 and 2018, respectively.

Loans Past Due Not Impaired

Loans that are past due but not classified as impaired are loans where our customers have failed to make payments when contractually due but for which we expect the full amount of principal and interest payments to be collected, or loans which are held at fair value. The following table presents loans that are past due but not classified as impaired as at October 31, 2019 and 2018.

(Canadian \$ in millions)	1 to 29 days		30 to 89 days		90 days or more		Total	
	2019	2018	2019	2018	2019	2018	2019	2018
Residential mortgages	806	660	465	513	16	21	1,287	1,194
Credit card, consumer instalment and other personal loans	1,590	1,431	426	415	87	88	2,103	1,934
Business and government loans	351	611	207	268	59	55	617	934
Total	2,747	2,702	1,098	1,196	162	164	4,007	4,062

ECL Sensitivity and Key Economic Variables

The allowance for performing loans is sensitive to changes in both economic forecasts and the probability-weight assigned to each forecast scenario. Many of the factors have a high degree of interdependency, although there is no single factor to which loan impairment allowances as a whole are sensitive.

If we assumed a 100% base case economic forecast and included the impact of loan migration by restaging, with other assumptions held constant including the application of experienced credit judgment, the allowance for performing loans would be approximately \$1,325 million as at October 31, 2019 (\$1,250 million in 2018) compared to the reported allowance for performing loans of \$1,609 million (\$1,473 million in 2018).

If we assumed a 100% adverse economic forecast and included the impact of loan migration by restaging, with other assumptions held constant including the application of experienced credit judgment, the allowance for performing loans would be approximately \$2,800 million as at October 31, 2019 (\$2,650 million in 2018) compared to the reported allowance for performing loans of \$1,609 million (\$1,473 million in 2018).

Actual results in a recession will differ as our portfolio will change through time due to migration, growth, risk mitigation actions and other factors. In addition, our allowance will reflect the three economic scenarios used in assessing the allowance, with weightings attached to adverse and benign scenarios often unequally weighted, and the weightings will change through time.

The following table shows the key economic variables we use to estimate our allowance on performing loans during the forecast period. The values shown represent the end of period national average values for the first 12 months and then the national average for the remaining horizon. While the values disclosed below are national variables, in our underlying models we use regional variables where considered appropriate.

As at October 31	Benign scenario				Base scenario				Adverse scenario			
	First 12 months		Remaining horizon (1)		First 12 months		Remaining horizon (1)		First 12 months		Remaining horizon (1)	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Real gross domestic product (2)												
Canada	2.9%	3.1%	2.3%	2.4%	1.6%	1.8%	1.6%	1.6%	(3.2)%	(3.2)%	0.8%	0.8%
U.S.	2.4%	2.9%	2.3%	1.9%	1.8%	2.4%	1.9%	1.6%	(2.9)%	(2.9)%	0.9%	0.9%
Corporate BBB 10-year spread												
Canada	2.0%	2.0%	2.1%	2.1%	2.3%	2.3%	2.3%	2.3%	4.7%	4.7%	3.9%	3.9%
U.S.	1.8%	1.8%	2.0%	2.0%	2.4%	2.2%	2.4%	2.3%	4.3%	4.3%	3.4%	3.5%
Unemployment rates												
Canada	5.1%	5.4%	4.9%	5.2%	5.7%	5.6%	5.9%	5.6%	8.9%	9.3%	8.9%	9.3%
U.S.	3.3%	3.2%	3.2%	3.1%	3.7%	3.6%	3.8%	3.7%	6.5%	6.7%	6.6%	6.8%
Housing Price Index												
Canada (3)	3.7%	2.4%	3.6%	2.6%	1.8%	1.4%	2.5%	1.8%	(12.8)%	(12.8)%	(3.2)%	(3.2)%
U.S. (4)	4.5%	5.1%	4.1%	4.3%	3.0%	3.6%	2.7%	3.0%	(7.3)%	(7.3)%	(1.2)%	(1.2)%

(1) The remaining forecast period is two years.

(2) Real gross domestic product is based on year over year growth.

(3) In Canada, we use the HPI Benchmark Composite.

(4) In the U.S., we use the National Case-Shiller House Price Index.

The ECL approach requires the recognition of credit losses generally based on 12 months of expected losses for performing loans (Stage 1) and the recognition of lifetime expected losses on performing loans that have experienced a significant increase in credit risk since origination (Stage 2). Under our current probability-weighted scenarios, if all our performing loans were in Stage 1, our models would generate an allowance for performing loans of approximately \$1,050 million compared to the reported allowance for performing loans of \$1,609 million as at October 31, 2019 (\$1,000 million compared to the reported allowance for performing loans of \$1,473 million as at October 31, 2018).

Renegotiated Loans

From time to time we modify the contractual terms of a loan due to the poor financial condition of the borrower. We assess renegotiated loans for impairment consistent with our existing policies for impairment. When renegotiation leads to significant concessions being granted, and the concessions are for economic or legal reasons related to the borrower's financial difficulty that we would not otherwise consider, the loan is classified as impaired. We consider one or a combination of the following to be significant concessions: (1) a reduction of the stated interest rate, (2) an extension of the maturity date or dates at a stated interest rate lower than the current market rate for a new loan with similar terms, or (3) forgiveness of principal or accrued interest.

Renegotiated loans are permitted to remain in performing status if the modifications are not considered to be significant, or are returned to performing status when none of the criteria for classification as impaired continue to apply.

The carrying value of our renegotiated loans modified during the year was \$229 million as at October 31, 2019 (\$253 million as at October 31, 2018). Renegotiated loans of \$36 million (\$53 million in 2018 and \$36 million in 2017) were written off during the year ended October 31, 2019. As at October 31, 2019, \$66 million (\$93 million as at October 31, 2018) of loans previously renegotiated saw their loss allowance change during the year from lifetime to 12-month expected credit loss.

Foreclosed Assets

Property or other assets that we receive from borrowers to satisfy their loan commitments are classified as either held-for-use or held-for-sale according to management's intention and are initially recorded at their carrying amount.

During the year ended October 31, 2019, we foreclosed on impaired loans and received \$125 million of real estate properties that we classified as held for sale (\$117 million in 2018).

As at October 31, 2019, real estate properties held for sale totalled \$62 million (\$58 million in 2018). These properties are disposed of when considered appropriate.

Collateral

Collateral is used to manage credit risk related to securities borrowed or purchased under resale agreements, residential mortgages, consumer instalment and other personal loans and business and government loans. Additional information on our collateral requirements is included in Notes 14 and 24, as well as in the blue-tinted font in the Enterprise-Wide Risk Management section of Management's Discussion and Analysis on pages 78 to 80 of this report.

Note 5: Risk Management

We have an enterprise-wide approach to the identification, measurement, monitoring and control of risks faced across our organization. The key risks related to our financial instruments are classified as credit and counterparty, market, and liquidity and funding risk.

Credit and Counterparty Risk

Credit and counterparty risk is the potential for loss due to the failure of a borrower, endorser, guarantor or counterparty to repay a loan or honour another predetermined financial obligation. Credit risk arises predominantly with respect to loans, over-the-counter and centrally cleared derivatives and other credit instruments. This is the most significant measurable risk that we face.

Our risk management practices and key measures are disclosed in the blue-tinted font in the Enterprise-Wide Risk Management section of Management's Discussion and Analysis on pages 78 to 82 of this report. Additional information on credit risk related to loans and derivatives is included in Notes 4 and 8, respectively.

Market Risk

Market risk is the potential for adverse changes in the value of our assets and liabilities resulting from changes in market variables such as interest rates, foreign exchange rates, equity and commodity prices and their implied volatilities, and credit spreads, and includes the risk of credit migration and default in our trading book. We incur market risk in our trading and underwriting activities and in the management of structural market risk in our banking and insurance activities.

Our market risk management practices and key measures are disclosed in the blue-tinted font in the Enterprise-Wide Risk Management section of Management's Discussion and Analysis on pages 86 to 90 of this report.

Liquidity and Funding Risk

Liquidity and funding risk is the potential for loss if we are unable to meet our financial commitments in a timely manner at reasonable prices as they become due. It is our policy to ensure that sufficient liquid assets and funding capacity are available to meet financial commitments, including liabilities to depositors and suppliers, and lending, investment and pledging commitments, even in times of stress. Managing liquidity and funding risk is essential to maintaining enterprise soundness and safety, depositor confidence and earnings stability.

Our liquidity and funding risk management practices and key measures are disclosed in the blue-tinted font in the Enterprise-Wide Risk Management section of Management's Discussion and Analysis on pages 91 to 99 of this report.

Note 6: Transfer of Assets

Loan Securitization

We sell Canadian residential mortgages to third-party Canadian securitization programs, including the Canada Mortgage Bond program, directly to third-party investors under the National Housing Act Mortgage-Backed Securities ("NHA-MBS") program and under our own program. We assess whether substantially all of the risks and rewards of or control over the loans have been transferred to determine whether they qualify for derecognition.

Under these programs, we are entitled to the payment over time of the excess of the sum of interest and fees collected from customers, in connection with the mortgages that were sold, over the yield paid to investors, less credit losses and other costs. We also act as counterparty in interest rate swap agreements where we pay the interest due to Canadian Mortgage Bond holders and receive the interest on the underlying mortgages, which are converted into MBS through the NHA-MBS program and sold to the Canada Housing Trust. Since we continue to be exposed to substantially all the prepayment, interest rate and credit risk associated with the securitized mortgages, they do not qualify for derecognition. We continue to recognize the mortgages and the related cash proceeds as secured financing in our Consolidated Balance Sheet. The interest and fees collected, net of the yield paid to investors, are recorded in net interest income using the effective interest method over the term of the securitization. Credit losses associated with the mortgages are recorded in the provision for credit losses. During the year ended October 31, 2019, we sold \$6,692 million of mortgages to these programs (\$8,062 million in 2018).

The following table presents the carrying amounts and fair values of transferred assets that did not qualify for derecognition and the associated liabilities:

(Canadian \$ in millions)	2019		2018	
	Carrying amount (1)	Fair value	Carrying amount (1)	Fair value
Assets				
Residential mortgages	6,357		5,569	
Other related assets (2)	10,872		11,640	
Total	17,229	17,253	17,209	17,105
Associated liabilities (3)	16,993	17,202	16,925	16,763

(1) Carrying amount of loans is net of allowance.

(2) Other related assets represent payments received on account of mortgages pledged under securitization programs that have not yet been applied against the associated liabilities. The payments received are held in permitted instruments on behalf of the investors in the securitization vehicles until principal payments are required to be made on the associated liabilities. In order to compare all assets supporting the associated liabilities, this amount is added to the carrying amount of the securitized assets in the table above.

(3) Associated liabilities are recognized in Securitization and structured entities' liabilities in our Consolidated Balance Sheet.

Transferred Financial Assets that Qualified for Derecognition

We retain the mortgage servicing rights for certain mortgage loans purchased or originated in the U.S. which are sold and derecognized. During the year ended October 31, 2019, we sold and derecognized \$460 million (\$936 million in 2018) and recognized a \$15 million gain (\$21 million in 2018) in non-interest revenue. We retain mortgage servicing rights for these loans, which represent our continuing involvement. As at October 31, 2019, the carrying value of the mortgage servicing right was \$43 million (\$52 million as at October 31, 2018).

Securities Lent or Sold Under Repurchase Agreements

Securities lent or sold under repurchase agreements represent short-term funding transactions in which we sell securities that we own and simultaneously commit to repurchase the same securities at a specified price on a specified date in the future. We retain substantially all the risks and rewards associated with the securities and we continue to recognize them in our Consolidated Balance Sheet, with the obligation to repurchase these securities recorded as secured borrowing transactions at the amount owing. The carrying value of these securities approximates the carrying value of the associated liabilities, which total \$86,656 million as at October 31, 2019 (\$66,684 million as at October 31, 2018), due to the short-term nature. The interest expense related to these liabilities is recorded on an accrual basis in interest expense, other liabilities, in our Consolidated Statement of Income.

Note 7: Structured Entities

We enter into certain transactions in the ordinary course of business which involve the establishment of SEs to facilitate or secure customer transactions and to obtain alternate sources of funding. We are required to consolidate an SE if we control the entity. We control an SE when we have power over the SE, exposure to variable returns as a result of our involvement, and the ability to exercise power to affect the amount of our returns.

In assessing whether we control an SE, we consider the entire arrangement to determine the purpose and design of the SE, the nature of any rights held through contractual arrangements, and whether we are acting as principal or agent.

We perform a reassessment of consolidation if facts and circumstances indicate that there have been changes to one or more of the elements of control over the SE. Information regarding our basis of consolidation is included in Note 1.

Consolidated Structured Entities

Bank Securitization Vehicles

We use securitization vehicles to securitize our Canadian credit card loans, Canadian real estate lines of credit, Canadian auto loans and equipment loans in order to obtain alternate sources of funding. The structure of these vehicles limits the activities they can undertake and the types of assets they can hold, and the vehicles have limited decision-making authority. The vehicles issue term asset-backed securities to fund their activities. We control and consolidate these vehicles, as we have the key decision-making powers necessary to obtain the majority of the benefits of their activities.

The following table presents the carrying amounts and fair values of transferred assets that did not qualify for derecognition and the associated liabilities issued by our bank securitization vehicles:

(Canadian \$ in millions)	2019		2018	
	Carrying amount (1)	Fair value	Carrying amount (1)	Fair value
Assets				
Credit cards	7,747	7,747	7,246	7,246
Consumer instalment and other personal (2)	5,872	5,876	6,827	6,799
Business and government	716	721	-	-
Total	14,335	14,344	14,073	14,045
Associated liabilities (3)	10,166	10,209	8,179	8,134

(1) Carrying amount of loans is net of allowance.

(2) Includes Canadian real estate lines of credit and Canadian auto loans.

(3) Associated liabilities are recognized in Securitization and structured entities' liabilities in our Consolidated Balance Sheet.

U.S. Customer Securitization Vehicle

We sponsor one customer securitization vehicle (also referred to as a bank-sponsored multi-seller conduit) that provides our customers with alternate sources of funding through the securitization of their assets. This vehicle provides clients with access to financing in the asset-backed commercial paper ("ABCP") markets by allowing them to either sell their assets directly into the vehicle or indirectly by selling an interest in the securitized assets into the vehicle, which then issues ABCP to investors in order to fund the purchases. We do not sell assets to the customer securitization vehicle. We earn fees for providing services related to the securitizations, including liquidity, distribution and financial arrangement fees for supporting the ongoing operations of the vehicle. We have determined that we control and therefore consolidate this vehicle, as we are exposed to its variable returns and we have the key decision-making powers necessary to affect the amount of those returns in our capacity as liquidity provider and servicing agent.

We provide committed liquidity support facilities to this vehicle, which may require that we provide additional financing to the vehicle in the event that certain events occur. The total committed undrawn amount under these facilities at October 31, 2019 was \$6,733 million (\$7,100 million at October 31, 2018).

Capital and Funding Vehicles

We have a funding vehicle, created under the covered bond program, that was created to guarantee payments due to bondholders on bonds issued by us. We sell assets to this funding vehicle in exchange for an intercompany loan.

We may also use capital vehicles to transfer our credit exposure on certain loan assets. We purchase credit protection against eligible credit events from these vehicles. The vehicles collateralize their obligation through the issuance of guarantee-linked notes. Loan assets are not sold or assigned to the vehicles and remain on our Consolidated Balance Sheet. As at October 31, 2019, \$325 million of guarantee-linked notes issued by these vehicles were included in deposits in our Consolidated Balance Sheet (\$325 million as at October 31, 2018).

For those vehicles that purchase assets from us or are designed to pass on our credit risk, we have determined that, based on the rights of the arrangements or through our equity interest, we have significant exposure to the variable returns of the vehicles, and we control and therefore consolidate these vehicles. Additional information related to notes issued by, and assets sold to, these vehicles is provided in Note 13 and Note 24, respectively.

Unconsolidated Structured Entities

The table below presents amounts related to our interests in unconsolidated SEs:

(Canadian \$ in millions)	2019		2018	
	Capital vehicles	Canadian customer securitization vehicles (1)	Capital vehicles	Canadian customer securitization vehicles (1)
Interests recorded on the balance sheet				
Cash and cash equivalents	547	66	118	53
Trading securities	-	8	-	12
FVTPL securities	-	567	-	582
FVOCI securities	-	616	2	242
Trading loans	-	-	7	-
Other	15	-	3	13
	562	1,257	130	902
Deposits	547	66	570	53
Other	9	-	17	-
	556	66	587	53
Exposure to loss (2)	-	7,453	28	7,135
Total assets of the entities	556	4,854	587	5,033

(1) Securities held that are issued by our Canadian customer securitization vehicles are comprised of asset-backed commercial paper and are classified as trading securities, FVTPL securities and FVOCI securities. All assets held by these vehicles relate to assets in Canada.

(2) Exposure to loss represents securities held, undrawn liquidity facilities, total committed amounts of the BMO funded vehicle, derivative assets and loans.

Capital Vehicles

We also use capital vehicles to pass our credit risk to security holders of the vehicles. In these situations, we are not exposed to significant default or credit risk. Our remaining exposure to variable returns is less than that of the note holders in these vehicles, who are exposed to our default and credit risk. We are not required to consolidate these vehicles. In 2019, one of our capital vehicles redeemed a note issued by us. Additional information is provided in Note 16.

Canadian Customer Securitization Vehicles

We sponsor customer securitization vehicles (also referred to as bank-sponsored multi-seller conduits) that provide our customers with alternate sources of funding through the securitization of their assets. These vehicles provide clients with access to financing either from BMO or in the ABCP markets by allowing them to either sell their assets directly into the vehicle or indirectly by selling an interest in the securitized assets into the vehicle, which then issues ABCP to either investors or BMO to fund the purchases. We do not sell assets to the customer securitization vehicles. We earn fees for providing services related to the securitizations, including liquidity, distribution and financial arrangement fees for supporting the ongoing operations of the vehicles. We have determined that we do not control these entities, as their key relevant activity, the servicing of program assets, does not reside with us.

We provide liquidity facilities to the market-funded vehicles, which may require that we provide additional financing to the vehicles in the event that certain events occur. The total committed and undrawn amount under these liquidity facilities and any undrawn amounts of the BMO funded vehicle at October 31, 2019 was \$6,262 million (\$6,286 million at October 31, 2018).

BMO Managed Funds

We have established a number of funds that we also manage. We assess whether or not we control these funds based on the economic interest we have in the funds, including investments in the funds and management fees earned from the funds, and any investors' rights to remove us as investment manager. Based on our assessment, we have determined that we do not control these funds. Our total interest in unconsolidated BMO managed funds was \$1,728 million at October 31, 2019 (\$1,612 million in 2018), which is included in securities in our Consolidated Balance Sheet.

Other Structured Entities

We purchase and hold investments in a variety of third-party structured entities, including exchange-traded funds, mutual funds, limited partnerships and investment trusts which are recorded in securities in our Consolidated Balance Sheet. We are considered to have an interest in these investments through our holdings and because we may act as a counterparty in certain derivatives contracts. We are not the investment manager or the sponsor of any of these investments. We are generally a passive investor and do not have power over the key decision-making activities of these investments. Our maximum exposure to loss from our investments is limited to the carrying amounts of our investments and any unutilized commitment we have provided.

Sponsored Structured Entities

We may be deemed to be the sponsor of an SE if we are involved in the design, legal set-up or its marketing. We may also be deemed to be the sponsor of an SE if market participants would reasonably associate the entity with us. We do not have an interest in SEs that we have sponsored.

Additional information on our compensation trusts is provided in Note 20.

Note 8: Derivative Instruments

Derivative instruments are financial contracts that derive their value from underlying changes in interest rates, foreign exchange rates or other financial or commodity prices or indices.

Derivative instruments are either regulated exchange-traded contracts or negotiated over-the-counter contracts. We use these instruments for trading purposes, as well as to manage our exposures, mainly to foreign currency and interest rate fluctuations, as part of our asset/liability management program.

Types of Derivatives

Swaps

Swaps are contractual agreements between two parties to exchange a series of cash flows. The various swap agreements that we enter into are as follows:

Interest rate swaps – counterparties generally exchange fixed and floating rate interest payments based on a notional value in a single currency.

Cross-currency swaps – fixed rate interest payments and principal amounts are exchanged in different currencies.

Cross-currency interest rate swaps – fixed and/or floating rate interest payments and principal amounts are exchanged in different currencies.

Commodity swaps – counterparties generally exchange fixed and floating rate payments based on a notional value of a single commodity.

Equity swaps – counterparties exchange the return on an equity security or a group of equity securities for the return based on a fixed or floating interest rate or the return on another equity security or group of equity securities.

Credit default swaps – one counterparty pays the other a fee in exchange for that other counterparty agreeing to make a payment if a credit event occurs, such as bankruptcy or failure to pay.

Total return swaps – 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.

Forwards and Futures

Forwards and futures are contractual agreements to either buy or sell a specified amount of a currency, commodity, interest-rate-sensitive financial instrument or security at a specified price and date in the future.

Forwards are customized contracts transacted in the over-the-counter market. Futures are transacted in standardized amounts on regulated exchanges and are subject to daily cash margining.

Options

Options are contractual agreements that convey to the purchaser the right but not the obligation to either buy or sell a specified amount of a currency, commodity, interest-rate-sensitive financial instrument or security at a fixed future date or at any time within a fixed future period.

For options written by us, we receive a premium from the purchaser for accepting market risk.

For options purchased by us, we pay a premium for the right to exercise the option. Since we have no obligation to exercise the option, our primary exposure to risk is the potential credit risk if the writer of an over-the-counter contract fails to meet the terms of the contract.

Caps, collars and floors are specialized types of written and purchased options. They are contractual agreements in which the writer agrees to pay the purchaser, based on a specified notional amount, the difference between the market rate and the prescribed rate of the cap, collar or floor. The writer receives a premium for selling this instrument.

A swaption is an option granting its owner the right but not the obligation to enter into an underlying swap.

A future option is an option contract in which the underlying instrument is a single futures contract.

The main risks associated with these derivative instruments are related to exposure to movements in interest rates, foreign exchange rates, credit quality, value of the underlying financial instrument or commodity, as applicable, and the possible inability of counterparties to meet the terms of the contracts.

Embedded Derivatives

From time to time, we purchase or issue financial instruments containing embedded derivatives. The embedded derivative in a financial liability is separated from the host contract and carried at fair value if the economic characteristics of the derivative are not closely related to those of the host contract, the terms of the embedded derivative are the same as those of a stand-alone derivative, and the combined contract is not measured at fair value. To the extent that we cannot reliably identify and measure the embedded derivative, the entire contract is carried at fair value, with changes in fair value reflected in income. Embedded derivatives in certain of our equity linked notes are accounted for separately from the host instrument.

Contingent Features

Certain over-the-counter derivative instruments contain provisions that link the amount of collateral we are required to post or pay to our credit ratings (as determined by the major credit rating agencies). If our credit ratings were to be downgraded, certain counterparties to these derivative instruments could demand immediate and ongoing collateralization on derivative liability positions or request immediate payment. The aggregate fair value of all derivative instruments with collateral posting requirements that were in a liability position on October 31, 2019 was \$5,736 million (\$2,860 million in 2018), for which we have posted collateral of \$5,660 million (\$2,963 million in 2018).

Risks Hedged

Interest Rate Risk

We manage interest rate risk through interest rate futures, interest rate swaps and options, which are linked to and adjust the interest rate sensitivity of a specific asset, liability, forecasted transaction or firm commitment, or a specific pool of transactions with similar risk characteristics.

Foreign Currency Risk

We manage foreign currency risk through currency futures, foreign currency options, cross-currency swaps, foreign exchange spot transactions, forward contracts and deposits denominated in foreign currencies.

Equity Price Risk

We manage equity price risk through total return swaps.

Trading Derivatives

Trading derivatives include derivatives entered into with customers to accommodate their risk management needs, market-making to facilitate customer-driven demand for derivatives, derivatives transacted on a limited basis to generate trading income from our principal trading positions, and certain derivatives that we enter into as part of our risk management strategy that do not qualify as hedges for accounting purposes ("economic hedges").

We structure and market derivative products to enable customers to transfer, modify or reduce current or expected exposure to risks.

Principal trading activities include market-making and positioning activities. Market-making involves quoting bid and offer prices to other market participants with the intention of generating revenues based on spread and volume. Positioning activities involve managing market risk positions with the expectation of profiting from favourable movements in prices, rates or indices.

Trading derivatives are recorded at fair value. Realized and unrealized gains and losses are generally recorded in non-interest revenue, trading revenues, in our Consolidated Statement of Income. Unrealized gains and losses on derivatives used to economically hedge certain exposures may be recorded in the Consolidated Statement of Income in the same line as the unrealized gains and losses arising from the exposures. Unrealized gains on trading derivatives are recorded as derivative instrument assets and unrealized losses are recorded as derivative instrument liabilities in our Consolidated Balance Sheet.

We may also economically hedge a portion of our U.S. dollar earnings through forward foreign exchange contracts and/or options to minimize fluctuations in our consolidated net income due to the translation of our U.S. dollar earnings. These contracts are recorded at fair value, with changes in fair value recorded in non-interest revenue, trading revenues, in our Consolidated Statement of Income.

Fair Value of Trading and Hedging Derivatives

Fair value represents point-in-time estimates that may change in subsequent reporting periods due to market conditions or other factors. A discussion of the fair value measurement of derivatives is included in Note 17.

Fair values of our derivative instruments are as follows:

(Canadian \$ in millions)	2019			2018		
	Gross assets	Gross liabilities	Net	Gross assets	Gross liabilities	Net
Trading						
Interest Rate Contracts						
Swaps	7,588	(5,834)	1,754	7,013	(5,637)	1,376
Forward rate agreements	44	(157)	(113)	36	(10)	26
Futures	1	(4)	(3)	2	(3)	(1)
Purchased options	632	-	632	425	-	425
Written options	-	(403)	(403)	-	(273)	(273)
Foreign Exchange Contracts						
Cross-currency swaps	2,394	(1,383)	1,011	2,362	(1,678)	684
Cross-currency interest rate swaps	3,471	(4,950)	(1,479)	4,977	(6,057)	(1,080)
Forward foreign exchange contracts	2,796	(2,379)	417	4,335	(2,817)	1,518
Purchased options	188	-	188	241	-	241
Written options	-	(203)	(203)	-	(228)	(228)
Commodity Contracts						
Swaps	754	(1,273)	(519)	1,559	(1,084)	475
Futures	122	(40)	82	17	-	17
Purchased options	270	-	270	484	-	484
Written options	-	(367)	(367)	-	(372)	(372)
Equity Contracts						
	1,199	(2,999)	(1,800)	2,158	(2,402)	(244)
Credit Contracts						
Purchased	2	(98)	(96)	1	(36)	(35)
Written	47	(4)	43	9	(1)	8
Total fair value – trading derivatives	19,508	(20,094)	(586)	23,619	(20,598)	3,021
Hedging						
Interest Rate Contracts						
Cash flow hedges – swaps	1,393	(121)	1,272	18	(1,261)	(1,243)
Fair value hedges – swaps	799	(1,435)	(636)	701	(668)	33
Total swaps	2,192	(1,556)	636	719	(1,929)	(1,210)
Foreign Exchange Contracts						
Cash flow hedges	420	(1,948)	(1,528)	1,084	(1,074)	10
Total foreign exchange contracts	420	(1,948)	(1,528)	1,084	(1,074)	10
Equity Contracts						
Cash flow hedges	24	-	24	-	(28)	(28)
Total equity contracts	24	-	24	-	(28)	(28)
Total fair value – hedging derivatives (1)	2,636	(3,504)	(868)	1,803	(3,031)	(1,228)
Total fair value – trading and hedging derivatives	22,144	(23,598)	(1,454)	25,422	(23,629)	1,793
Less: impact of master netting agreements	(13,538)	13,538	-	(15,575)	15,575	-
Total	8,606	(10,060)	(1,454)	9,847	(8,054)	1,793

(1) The fair values of hedging derivatives wholly or partially offset the changes in fair values of the related on-balance sheet financial instruments. Certain comparative figures have been reclassified to conform with the current year's presentation.

Assets are shown net of liabilities to customers where we have a legally enforceable right to offset amounts and we intend to settle contracts on a net basis.

Notional Amounts of Trading Derivatives

The notional amounts of our derivatives represent the amount to which a rate or price is applied in order to calculate the amount of cash that must be exchanged under the contract. Notional amounts do not represent assets or liabilities and therefore are not recorded in our Consolidated Balance Sheet.

(Canadian \$ in millions)	2019			2018		
	Exchange traded	Over-the-counter	Total	Exchange traded	Over-the-counter	Total
Interest Rate Contracts						
Swaps	-	4,209,193	4,209,193	-	3,684,763	3,684,763
Forward rate agreements	-	491,437	491,437	-	411,573	411,573
Purchased options	13,737	42,084	55,821	26,629	35,023	61,652
Written options	16,446	49,487	65,933	16,511	48,721	65,232
Futures	225,747	-	225,747	192,482	-	192,482
Total interest rate contracts	255,930	4,792,201	5,048,131	235,622	4,180,080	4,415,702
Foreign Exchange Contracts						
Cross-currency swaps	-	47,977	47,977	-	57,226	57,226
Cross-currency interest rate swaps	-	499,571	499,571	-	449,187	449,187
Forward foreign exchange contracts	-	453,711	453,711	-	463,743	463,743
Purchased options	3,295	37,397	40,692	2,625	21,468	24,093
Written options	2,502	42,075	44,577	1,420	24,018	25,438
Futures	882	-	882	739	-	739
Total foreign exchange contracts	6,679	1,080,731	1,087,410	4,784	1,015,642	1,020,426
Commodity Contracts						
Swaps	-	24,722	24,722	-	24,366	24,366
Purchased options	3,615	6,608	10,223	3,303	6,182	9,485
Written options	5,230	4,371	9,601	4,909	4,233	9,142
Futures	32,422	-	32,422	33,104	-	33,104
Total commodity contracts	41,267	35,701	76,968	41,316	34,781	76,097
Equity Contracts						
	39,952	50,910	90,862	33,687	52,725	86,412
Credit Contracts						
Purchased	-	5,361	5,361	-	3,047	3,047
Written	-	2,068	2,068	-	443	443
Total	343,828	5,966,972	6,310,800	315,409	5,286,718	5,602,127

Derivatives Used in Hedge Accounting

In accordance with our risk management strategy, we enter into various derivative contracts to hedge our interest rate, foreign currency and equity price exposures. In addition, we use deposits to hedge foreign currency exposure in our net investment in foreign operations. To the extent these instruments qualify for hedge accounting, we designate them in accounting hedge relationships. Our structural market risk strategies, including our approach to managing interest rate and foreign exchange risk, are included in the blue-tinted font in the Structural (Non-Trading) Market Risk section of Management's Discussion and Analysis on page 89 of this report. In addition, our exposure to foreign exchange rate risk is discussed in the Foreign Exchange Risk section of Management's Discussion and Analysis on page 90. Our exposure to equity price risk and our approach to managing it are discussed in the "Other Share-Based Compensation, Mid-Term Incentive Plans" section of Note 20.

By using derivatives to hedge exposures to interest rates, foreign currency exchange rates, and equity prices, we are also exposed to the credit risk of the derivative counterparty. We mitigate credit risk by entering into transactions with high-quality counterparties, requiring the counterparties to post collateral, entering into master netting agreements, or settling through centrally cleared counterparties.

In order to qualify as an accounting hedge, the hedging relationship must be designated and formally documented at its inception, detailing the particular risk management objective and strategy for the hedge and the specific asset, liability or cash flow being hedged, as well as how effectiveness is to be assessed. Changes in the fair value of the derivative must be highly effective in offsetting changes in the fair value or changes in the amount of future cash flows of the hedged item. We evaluate hedge effectiveness at the inception of the hedging relationship and on an ongoing basis, retrospectively and prospectively, primarily using a quantitative statistical regression analysis. We consider a hedging relationship highly effective when all of the following criteria are met: correlation between the variables in the regression is at least 0.8; the slope of the regression is within a 0.8 to 1.25 range; and the confidence level of the slope is at least 95%. The practice is different for our net investment hedge, discussed in the Net Investment Hedges section below.

Any ineffectiveness in the hedging relationship is recognized as it arises in non-interest revenue, other, in our Consolidated Statement of Income.

The following table outlines the notional amounts and average rates of derivatives and the carrying amounts of deposits designated as hedging instruments, by term to maturity, hedge type, and risk type, where applicable.

(Canadian \$ in millions, except as noted)	Remaining term to maturity					2019	2018
	Within 1 year	1 to 3 years	3 to 5 years	5 to 10 years	Over 10 years	Total	Total
Cash Flow Hedges							
Interest rate risk – Interest rate swaps							
Notional amount	18,151	27,369	32,852	15,239	–	93,611	73,769
Average fixed interest rate	1.78%	2.06%	2.19%	1.83%	–	2.01%	2.21%
Foreign exchange risk – Cross-currency swaps and foreign exchange forwards (1)							
CAD-USD pair							
Notional amount	5,666	13,671	15,039	5,527	251	40,154	29,119
Average fixed interest rate	1.01%	1.86%	2.48%	1.59%	3.02%	1.95%	1.57%
Average exchange rate: CAD-USD	1.2938	1.3127	1.3121	1.2659	1.3122	1.3034	1.2930
CAD-EUR pair							
Notional amount	4,993	8,464	6,699	–	201	20,357	21,349
Average fixed interest rate	1.98%	2.42%	2.11%	–	2.97%	2.21%	2.11%
Average exchange rate: CAD-EUR	1.4719	1.4994	1.4894	–	1.4870	1.4892	1.4908
Other currency pairs (2)							
Notional amount	1,453	2,272	3,202	922	–	7,849	6,353
Average fixed interest rate	1.86%	2.56%	2.92%	2.54%	–	2.57%	2.59%
Average exchange rate: CAD-Non USD/EUR	1.6026	1.3199	1.1895	1.4539	–	1.3348	1.3430
Equity price risk – Total return swap							
Notional amount	316	–	–	–	–	316	381
Fair Value Hedges							
Interest rate risk – Interest rate swaps							
Notional amount	13,300	32,633	30,708	16,809	17	93,467	73,464
Average fixed interest rate	2.26%	2.18%	2.22%	2.30%	2.36%	2.23%	2.17%
Net Investment Hedges							
Foreign exchange risk							
USD denominated deposit – carrying amount	6,495	–	–	–	–	6,495	6,596
GBP denominated deposit – carrying amount	685	–	–	–	–	685	473

(1) Under certain hedge strategies using cross-currency swaps, a CAD leg is inserted to create two swaps designated as separate hedges (for example, a EURO-USD cross-currency swap split into EURO-CAD and CAD-USD cross-currency swaps). The relevant notional amount is grossed up in this table, as the cross-currency swaps are disclosed by CAD-foreign currency pair.

(2) Includes CAD-AUD, CAD-CHF, CAD-CNH, CAD-GBP or CAD-HKD cross-currency swaps where applicable.

Cash Flow Hedges

Cash flow hedges modify exposure to variability in cash flows for variable interest rate bearing instruments, foreign currency denominated assets and liabilities and certain cash-settled share-based payment grants subject to equity price risk. We use interest rate swaps with or without embedded options, cross-currency swaps, and total return swaps to hedge this variability. We hedge the full amount of foreign exchange risk, but interest rate risk is hedged only to the extent of benchmark interest rates. The benchmark interest rate is a component of interest rate risk that is observable in the relevant financial markets, for example London Interbank Offered Rate (“LIBOR”) or Bankers’ Acceptances (“BA”) rate.

We determine the amount of the exposure to which hedge accounting is applied by assessing the potential impact of changes in interest rates, foreign exchange rates, and equity prices on the future cash flows of floating rate loans and deposits, foreign currency denominated assets and liabilities and certain cash-settled share-based payments. This assessment is performed using analytical techniques, such as simulation, sensitivity analysis, stress testing and gap analysis.

We record interest that we pay or receive on these cash flow hedge derivatives as an adjustment to net interest income in our Consolidated Statement of Income over the life of the hedge.

To the extent that changes in the fair value of the derivative offsets changes in the fair value of the hedged item for the designated hedged risk, they are recorded in other comprehensive income. Hedge ineffectiveness, the portion of the change in fair value of the derivative that does not offset changes in the fair value of the hedged item, is recorded directly in non-interest revenue, other, in our Consolidated Statement of Income as it arises.

For cash flow hedges that are discontinued before the end of the original hedge term, the cumulative unrealized gain or loss recorded in other comprehensive income is amortized to our Consolidated Statement of Income in net interest income for interest rate swaps and in employee compensation for total return swaps as the hedged item is recorded in earnings. The entire unrealized gain or loss is recognized immediately in net interest income in our Consolidated Statement of Income, if the hedged item is sold or settled. In general, we do not terminate our foreign exchange hedges before maturity.

For cash flow hedges, we use a hypothetical derivative to measure the hedged risk of floating rate loans, deposits, foreign currency denominated assets and liabilities, or share-based payment grants. This hypothetical derivative matches the critical terms of the hedged items identically, and it perfectly offsets the hedged cash flow.

In our cash flow hedge relationships, the main sources of ineffectiveness are differences in interest rate indices, tenor and reset/settlement frequencies between the hedging instrument and the hedged item.

Net Investment Hedges

Net investment hedges mitigate our exposure to foreign currency exchange rate fluctuations related to our net investment in foreign operations.

Deposits denominated in foreign currencies are designated as a hedging instrument for a portion of the net investment in foreign operations. The foreign currency translation of our net investment in foreign operations and the effective portion of the corresponding hedging instrument are recorded in unrealized gains (losses) on translation of net foreign operations in other comprehensive income.

The effectiveness of our net investment hedge is determined using the dollar offset method with spot foreign currency rates. As the notional amount of the deposits and the hedged net investment in foreign operations are the same, there is no source of ineffectiveness in these hedging relationships.

For cash flow hedges and net investment hedges, the following tables contain information related to items designated as hedging instruments, hedged items and hedge ineffectiveness for the years ended October 31, 2019 and October 31, 2018.

(Canadian \$ in millions)	Carrying amount of hedging instruments (1)		Hedge ineffectiveness		
	Asset	Liability	Gains (losses) on hedging derivatives used to calculate hedge ineffectiveness	Gains (losses) on hypothetical derivatives used to calculate hedge ineffectiveness	Ineffectiveness recorded in non-interest revenue - other
2019					
Cash flow hedges					
Interest rate risk - Interest rate swaps	1,393	(121)	3,142	(3,118)	15
Foreign exchange risk - Cross-currency swaps and foreign exchange forwards	420	(1,948)	(1,195)	1,195	-
Equity price risk - Total return swaps	24	-	15	(15)	-
	1,837	(2,069)	1,962	(1,938)	15
Net investment hedges					
Foreign exchange risk - Deposit liabilities	-	(7,180)	(17)	17	-
Total	1,837	(9,249)	1,945	(1,921)	15

(1) Represents the unrealized gains (losses) within derivative financial instruments in assets and liabilities, respectively, in the Consolidated Balance Sheet.

(Canadian \$ in millions)	Carrying amount of hedging instruments (1)		Hedge ineffectiveness		
	Asset	Liability	Gains (losses) on hedging derivatives used to calculate hedge ineffectiveness	Gains (losses) on hypothetical derivatives used to calculate hedge ineffectiveness	Ineffectiveness recorded in non-interest revenue - other
2018					
Cash flow hedges					
Interest rate risk - Interest rate swaps	18	(1,261)	(1,685)	1,687	(4)
Foreign exchange risk - Cross-currency swaps and foreign exchange forwards	1,084	(1,074)	(459)	459	-
Equity price risk - Total return swaps	-	(28)	24	(24)	-
	1,102	(2,363)	(2,120)	2,122	(4)
Net investment hedges					
Foreign exchange risk - Deposit liabilities	-	(7,069)	(211)	211	-
Total	1,102	(9,432)	(2,331)	2,333	(4)

(1) Represents the unrealized gains (losses) within derivative financial instruments in assets and liabilities, respectively, in the Consolidated Balance Sheet.

For cash flow hedges and net investment hedges, the following tables contain information related to impacts on the Consolidated Statement of Other Comprehensive Income, on a pre-tax basis for the years ended October 31, 2019 and October 31, 2018.

(Canadian \$ in millions)	2019					
	Balance October 31, 2018	Gains / (losses) recognized in OCI	Amount reclassified to net income as the hedged item affects net income	Balance in cash flow hedge AOCI / net foreign operations AOCI		
				Balance October 31, 2019 (1)	Active hedges	Discontinued hedges
Cash flow hedges						
Interest rate risk	(2,211)	3,127	240	1,156	1,150	6
Foreign exchange risk	751	(1,177)	(18)	(444)	(444)	-
Equity price risk	30	15	(28)	17	17	-
	(1,430)	1,965	194	729	723	6
Net investment hedges						
Foreign exchange risk	(1,791)	(17)	-	(1,808)	(1,808)	-
Total	(3,221)	1,948	194	(1,079)	(1,085)	6

(1) Tax balance related to cash flow hedge AOCI is \$(216) million.

Balance in cash flow hedge AOCI /
net foreign operations AOCI

(Canadian \$ in millions)	Balance November 1, 2017	Gains / (losses) recognized in OCI	Amount reclassified to net income as the hedged item affects net income	Balance		
				October 31, 2018 (1)	Active hedges	Discontinued hedges
Cash flow hedges						
Interest rate risk	(597)	(1,681)	67	(2,211)	(1,348)	(863)
Foreign exchange risk	298	(3)	456	751	751	-
Equity price risk	72	24	(66)	30	30	-
	(227)	(1,660)	457	(1,430)	(567)	(863)
Net investment hedges						
Foreign exchange risk	(1,580)	(211)	-	(1,791)	(1,791)	-
Total	(1,807)	(1,871)	457	(3,221)	(2,358)	(863)

(1) Tax balance related to cash flow hedge AOCI is \$356 million.

Fair Value Hedges

Fair value hedges modify exposure to changes in a fixed rate instrument's fair value caused by changes in interest rates. These hedges economically convert fixed rate assets and liabilities to floating rate. We use interest rate swaps to hedge interest rate risk, including benchmark interest rates, inherent in fixed rate securities, a portfolio of mortgages, deposits and subordinated debt.

Any fixed rate assets or liabilities that are part of a hedging relationship are adjusted for the change in value of the risk being hedged. To the extent that the change in the fair value of the derivative does not offset changes in the fair value of the hedged item for the risk being hedged, the net amount (hedge ineffectiveness) is recorded directly in non-interest revenue, other, in our Consolidated Statement of Income.

For fair value hedges that are discontinued, we cease adjusting the hedged item. The cumulative fair value adjustment of the hedged item is then amortized to net interest income over the hedged item's remaining term to maturity. If the hedged item is sold or settled, the cumulative fair value adjustment is included in the gain or loss on sale or settlement.

In our fair value hedge relationships, the main sources of ineffectiveness are the counterparty effect and our own credit risk on the fair value of the swap, and the difference in terms such as fixed interest rate or reset/settlement frequency between the swap and the hedged item.

The amounts relating to derivatives designated as fair value hedging instruments, hedged items and hedge ineffectiveness for the years ended October 31, 2019 and October 31, 2018 are as follows:

(Canadian \$ in millions)	2019						2019	
	Carrying amount of hedging derivatives (1)		Hedge ineffectiveness			Accumulated amount of fair value hedge gains (losses) on hedged items		
	Asset	Liability	Gains (losses) on hedging derivatives used to calculate hedge ineffectiveness	Gains (losses) on hedged item used to calculate hedge ineffectiveness	Ineffectiveness recorded in non-interest revenue - other	Carrying amount of the hedged item (2)	Active hedges	Discontinued hedges
Fair value hedge								
Interest rate swaps	799	(1,435)						
Securities and loans	-	-	(2,072)	2,058	(14)	53,672	1,249	8
Deposits and subordinated debt	-	-	1,269	(1,255)	14	(41,277)	(609)	308
Total	799	(1,435)	(803)	803	-	12,395	640	316

(1) Represents the unrealized gains (losses) within derivative financial instruments in assets and liabilities, respectively, in the Consolidated Balance Sheet.

(2) Represents the carrying value on the Consolidated Balance Sheet and includes amortized cost, before allowance for credit losses, plus fair value hedge adjustments, except for FVOCI securities that are carried at fair value.

(Canadian \$ in millions)	2018						2018	
	Carrying amount of hedging derivatives (1)		Hedge ineffectiveness			Accumulated amount of fair value hedge gains (losses) on hedged items		
	Asset	Liability	Gains (losses) on hedging derivatives used to calculate hedge ineffectiveness	Gains (losses) on hedged item used to calculate hedge ineffectiveness	Ineffectiveness recorded in non-interest revenue - other	Carrying amount of the hedged item (2)	Active hedges	Discontinued hedges
Fair value hedge								
Interest rate swaps	701	(668)						
Securities and loans	-	-	850	(843)	7	36,722	(1,160)	-
Deposits and subordinated debt	-	-	(764)	761	(3)	(34,375)	719	436
Total	701	(668)	86	(82)	4	2,347	(441)	436

(1) Represents the unrealized gains (losses) within derivative financial instruments in assets and liabilities, respectively, in the Consolidated Balance Sheet.

(2) Represents the carrying value on the Consolidated Balance Sheet and includes amortized cost, before allowance for credit losses, plus fair value hedge adjustments, except for FVOCI securities that are carried at fair value.

Comparative Information

During 2017, net losses of \$1,161 million related to the effective portion of cash flow hedges were recognized in OCI. A gain of \$188 million related to cash flow hedges was transferred from equity to interest income or interest expense. Net ineffectiveness recognized on cash flow hedges during 2017 was a loss of \$7 million.

Included within non-interest revenue, other, is a fair value loss of \$200 million on derivatives held in qualifying fair value hedging relationships, and a gain of \$193 million representing net increases in the fair value of the hedged item attributable to the hedged risk.

Derivative-Related Market Risk

Derivative instruments are subject to market risk. Market risk arises from the potential for a negative impact on the balance sheet and/or statement of income due to adverse changes in the value of derivative instruments as a result of changes in certain market variables. These variables include interest rates, foreign exchange rates, equity and commodity prices and their implied volatilities, as well as credit spreads, credit migration and default. We strive to limit market risk by employing comprehensive governance and management processes for all market risk-taking activities.

Derivative-Related Credit Risk

Derivative instruments are subject to credit risk arising from the possibility that counterparties may default on their obligations. The credit risk associated with a derivative is normally a small fraction of the notional amount of the derivative instrument. Derivative contracts generally expose us to potential credit loss if changes in market rates affect the counterparty's position unfavourably and the counterparty defaults on payment. The credit risk is represented by the positive fair value of the derivative instrument. We strive to limit credit risk by dealing with counterparties that we believe are creditworthy, and we manage our credit risk for derivatives using the same credit risk process that is applied to loans and other credit assets.

We also pursue opportunities to reduce our exposure to credit losses on derivative instruments, including through collateral and by entering into master netting agreements with counterparties. The credit risk associated with favourable contracts is mitigated by legally enforceable master netting agreements to the extent that unfavourable contracts with the same counterparty must be settled concurrently with favourable contracts.

Exchange-traded derivatives have limited potential for credit exposure, as they are settled net daily with each exchange.

Terms used in the credit risk tables below are as follows:

Replacement cost captures the loss that would occur if a counterparty were to default at the present or at a future time, assuming that the closeout and replacement of transactions occur instantaneously, assuming no recovery on the value of those transactions in bankruptcy.

Credit risk equivalent represents the total replacement cost plus an amount representing the potential future credit exposure adjusted by a multiplier 1.4, as outlined in OSFI's Capital Adequacy Guideline.

Risk-weighted assets represent the credit risk equivalent, weighted on the basis of the creditworthiness of the counterparty, and considering collateral, netting and other credit risk mitigants, as prescribed by OSFI.

(Canadian \$ in millions)

2019

	Replacement cost (1)	Credit risk equivalent (1)	Risk-weighted assets
Interest Rate Contracts			
Over-the-counter			
Swaps	3,233	8,114	2,300
Forward rate agreements	102	1,162	236
Purchased options	11	62	39
Written options	38	154	98
	3,384	9,492	2,673
Exchange traded			
Futures	90	161	3
Purchased options	28	40	1
Written options	3	6	-
	121	207	4
Total interest rate contracts	3,505	9,699	2,677
Foreign Exchange Contracts			
Over-the-counter			
Swaps	1,184	6,248	989
Forward foreign exchange contracts	1,753	7,225	1,260
Purchased options	40	167	46
Written options	10	119	29
	2,987	13,759	2,324
Exchange traded			
Futures	13	20	-
Purchased options	13	24	-
Written options	-	2	-
	26	46	-
Total foreign exchange contracts	3,013	13,805	2,324
Commodity Contracts			
Over-the-counter			
Swaps	213	2,154	629
Purchased options	98	472	125
Written options	116	370	204
	427	2,996	958
Exchange traded			
Futures	393	1,079	22
Purchased options	378	567	11
Written options	1	52	1
	772	1,698	34
Total commodity contracts	1,199	4,694	992
Equity Contracts			
Over-the-counter	197	4,572	1,246
Exchange traded	1,083	2,580	52
Total equity contracts	1,280	7,152	1,298
Credit Contracts			
	277	496	34
Total	9,274	35,846	7,325

(1) In 2019, Replacement Cost and Credit Risk Equivalent are presented after the impact of master netting agreements and calculated using the Standardized Approach Counterparty Risk ("SA-CCR") in accordance with the Capital Adequacy Requirements ("CAR") Guideline issued by OSFI on October 30, 2018, effective for fiscal year 2019. Prior periods have not been restated as they conform with previous OSFI requirements.

(Canadian \$ in millions)	2018		
	Replacement cost (1)	Credit risk equivalent (1)	Risk-weighted assets
Interest Rate Contracts			
Over-the-counter			
Swaps	7,732	9,917	-
Forward rate agreements	36	34	-
Purchased options	409	393	-
	8,177	10,344	704
Exchange traded			
Futures	2	29	-
Purchased options	16	250	-
Written options	-	-	-
	18	279	
Total interest rate contracts	8,195	10,623	704
Foreign Exchange Contracts			
Over-the-counter			
Swaps	8,305	22,741	-
Forward foreign exchange contracts	4,453	8,373	-
Purchased options	225	424	-
	12,983	31,538	2,544
Exchange traded			
Futures	-	8	-
Purchased options	16	36	-
Written options	-	-	-
	16	44	
Total foreign exchange contracts	12,999	31,582	2,544
Commodity Contracts			
Over-the-counter			
Swaps	1,559	4,450	-
Purchased options	335	1,108	-
	1,894	5,558	1,188
Exchange traded			
Futures	17	770	-
Purchased options	149	305	-
Written options	-	-	-
	166	1,075	
Total commodity contracts	2,060	6,633	1,188
Equity Contracts			
Over-the-counter	1,585	4,332	
Exchange traded	573	1,646	
Total equity contracts	2,158	5,978	431
Credit Contracts			
Total derivatives	10	55	83
Total derivatives	25,422	54,871	4,950
Less: impact of master netting agreements	(15,575)	(29,589)	-
Total (2)	9,847	25,282	4,950

(1) In 2019, Replacement Cost and Credit Risk Equivalent are presented after the impact of master netting agreements and calculated using the SA-CCR in accordance with the CAR Guideline issued by OSFI on October 30, 2018, effective for fiscal year 2019. Prior periods have not been restated as they conform with previous OSFI requirements.

(2) The total derivatives and the impact of master netting agreements for replacement cost and credit risk equivalent do not include over-the-counter cleared derivatives with a fair value of \$846 million as at October 31, 2018.

Certain comparative figures have been reclassified to conform with the current year's presentation.

Term to Maturity

Our derivative contracts have varying maturity dates. The remaining contractual terms to maturity for the notional amounts of our derivative contracts are set out below:

(Canadian \$ in millions)	Term to maturity					2019	2018
	Within 1 year	1 to 3 years	3 to 5 years	5 to 10 years	Over 10 years	Total notional amounts	Total notional amounts
Interest Rate Contracts							
Swaps	1,652,793	1,321,286	771,362	510,596	140,235	4,396,272	3,831,997
Forward rate agreements, futures and options	723,117	89,440	15,942	9,446	993	838,938	730,939
Total interest rate contracts	2,375,910	1,410,726	787,304	520,042	141,228	5,235,210	4,562,936
Foreign Exchange Contracts							
Swaps	169,935	187,893	126,074	97,154	23,672	604,728	548,148
Forward foreign exchange contracts	442,750	9,590	1,226	119	26	453,711	472,323
Futures	862	18	2	-	-	882	739
Options	79,719	4,445	636	469	-	85,269	49,531
Total foreign exchange contracts	693,266	201,946	127,938	97,742	23,698	1,144,590	1,070,741
Commodity Contracts							
Swaps	6,374	15,899	2,132	317	-	24,722	24,366
Futures	12,120	16,782	3,096	424	-	32,422	33,104
Options	8,646	10,497	613	68	-	19,824	18,627
Total commodity contracts	27,140	43,178	5,841	809	-	76,968	76,097
Equity Contracts							
	69,854	13,875	5,494	1,636	319	91,178	86,794
Credit Contracts							
	204	444	4,152	2,451	178	7,429	3,490
Total notional amount	3,166,374	1,670,169	930,729	622,680	165,423	6,555,375	5,800,058

Certain comparative figures have been reclassified to conform with the current year's presentation.

Note 9: Premises and Equipment

We record all premises and equipment at cost less accumulated depreciation, and less any accumulated impairment, except land, which is recorded at cost. Buildings, computer equipment and operating system software, other equipment and leasehold improvements are depreciated on a straight-line basis over their estimated useful lives. When the major components of a building have different useful lives, they are accounted for separately and depreciated over each component's estimated useful life. The maximum estimated useful lives we use to depreciate our assets are as follows:

Buildings	10 to 40 years
Computer equipment and operating system software	5 to 7 years
Other equipment	10 years
Leasehold improvements	Lease term to a maximum of 10 years

Depreciation methods, useful lives and the residual values of premises and equipment are reviewed annually for any change in circumstances and are adjusted if appropriate. At each reporting period, we review whether there are any indications that premises and equipment need to be tested for impairment. If there is an indication that an asset may be impaired, we test for impairment by comparing the asset's carrying value to its recoverable amount. The recoverable amount is calculated as the higher of the value in use and the fair value less costs to sell. Value in use is the present value of the future cash flows expected to be derived from the asset. An impairment charge is recorded when the recoverable amount is less than the carrying value. There were no significant write-downs of premises and equipment due to impairment during the years ended October 31, 2019, 2018 and 2017. Gains and losses on disposal are included in non-interest expense, premises and equipment, in our Consolidated Statement of Income.

Net rent expense for premises and equipment reported in non-interest expense, premises and equipment, in our Consolidated Statement of Income for the years ended October 31, 2019, 2018 and 2017 was \$600 million, \$530 million and \$501 million, respectively.

(Canadian \$ in millions)	2019											2018		
	Land	Buildings	Computer equipment	Other equipment	Leasehold improvements	Total	Land	Buildings	Computer equipment	Other equipment	Leasehold improvements	Total		Total
Cost														
Balance at beginning of year	145	1,627	2,229	933	1,514	6,448	174	1,726	1,994	913	1,429	6,236		6,236
Additions	10	86	343	57	124	620	4	66	236	40	87	433		433
Disposals (1)	(45)	(179)	(102)	(15)	(24)	(365)	(32)	(163)	(11)	(27)	(20)	(253)		(253)
Foreign exchange and other	(1)	-	-	(2)	1	(2)	(1)	(2)	10	7	18	32		32
Balance at end of year	109	1,534	2,470	973	1,615	6,701	145	1,627	2,229	933	1,514	6,448		6,448
Accumulated Depreciation and Impairment														
Balance at beginning of year	-	1,016	1,662	704	1,080	4,462	-	1,063	1,465	674	1,001	4,203		4,203
Disposals (1)	-	(114)	(101)	(12)	(20)	(247)	-	(116)	(9)	(24)	(15)	(164)		(164)
Depreciation	-	59	227	51	98	435	-	60	201	48	91	400		400
Foreign exchange and other	-	-	(2)	(1)	(1)	(4)	-	9	5	6	3	23		23
Balance at end of year	-	961	1,786	742	1,157	4,646	-	1,016	1,662	704	1,080	4,462		4,462
Net carrying value	109	573	684	231	458	2,055	145	611	567	229	434	1,986		1,986

(1) Includes fully depreciated assets written off.

Note 10: Acquisitions

The cost of an acquisition is measured at the fair value of the consideration transferred, including contingent consideration. Acquisition-related costs are recognized as an expense in the period in which they are incurred. The identifiable assets acquired and liabilities assumed and contingent consideration are measured at their fair values at the date of acquisition. Goodwill is measured as the excess of the aggregate of the consideration transferred over the net of the fair value of identifiable assets acquired and liabilities assumed. The results of operations of acquired businesses are included in our consolidated financial statements beginning on the date of acquisition.

KGS-Alpha Capital Markets ("KGS")

On September 1, 2018, we completed the acquisition of the business of KGS, a U.S. fixed income broker-dealer specializing in U.S. mortgage and asset-backed securities in the institutional investor market, for cash consideration of US\$304 million (CAD\$397 million). The acquisition was accounted for as a business combination, and the acquired business and corresponding goodwill are included in our Capital Markets reporting segment. During the year ended October 31, 2019, the purchase price decreased to US\$303 million (CAD\$396 million) due to a post-closing adjustment based upon working capital. We also finalized our purchase price allocation and refined the valuation of intangible assets acquired, resulting in an intangible asset value of \$102 million on acquisition and a goodwill balance of \$6 million.

The intangible assets are being amortized over three to fourteen years on an accelerated basis. Goodwill of \$4 million related to this acquisition is deductible for tax purposes.

The fair values of the assets acquired and liabilities assumed at the date of acquisition are as follows:

(Canadian \$ in millions)		KGS
Securities – trading		5,193
Securities borrowed or purchased under resale agreements		5,669
Goodwill and intangible assets		108
Other assets		583
Total assets		11,553
Securities lent or sold under repurchase agreements		9,563
Securities sold but not yet purchased		1,431
Other liabilities		163
Purchase price		396

The purchase price allocation for KGS has been completed.

Note 11: Goodwill and Intangible Assets

Goodwill

When we complete an acquisition, we allocate the purchase price paid to the assets acquired, including identifiable intangible assets, and the liabilities assumed. Any portion of the consideration transferred that is in excess of the fair value of those net assets is considered to be goodwill. Goodwill is not amortized and is instead tested for impairment annually.

In performing the impairment test, we utilize the fair value less costs to sell for each group of CGUs based on discounted cash flow projections. Cash flows were projected for the first 10 years based on actual operating results, expected future business performance and past experience. Beyond 10 years, cash flows were assumed to grow at perpetual annual rates of up to 2.5% (3.0% in 2018). The discount rates we applied in determining the recoverable amounts in 2019 ranged from 8.0% to 11.0% (8.6% to 11.4% in 2018), and were based on our estimate of the cost of capital for each CGU. The cost of capital for each CGU was estimated using the Capital Asset Pricing Model, based on the historical betas of publicly traded peer companies that are comparable to the CGU.

There were no write-downs of goodwill due to impairment during the years ended October 31, 2019, 2018 and 2017.

The key assumptions described above may change as market and economic conditions change. However, we estimate that reasonably possible changes in these assumptions are not expected to cause the recoverable amounts of our CGUs to decline below their carrying amounts.

A continuity of our goodwill by group of CGUs for the years ended October 31, 2019 and 2018 is as follows:

(Canadian \$ in millions)	Personal and Commercial Banking			Traditional Wealth Management		Insurance	Wealth Management	BMO Capital Markets	Total
	Canadian P&C	U.S. P&C	Total	Total	Total	Total	Total		
Balance – October 31, 2017	97	3,719	3,816	2,137	2	2,139	289	6,244	
Acquisitions (disposals) during the year	-	-	-	-	-	-	54	54	
Foreign exchange and other (1)	-	78	78	(8)	-	(8)	5	75	
Balance – October 31, 2018	97	3,797	3,894	2,129	2	2,131	348	6,373	
Acquisitions (disposals) during the year	-	-	-	-	-	-	-	-	
Foreign exchange and other (1)	-	(1)	(1)	16	-	16	(48)	(33)	
Balance – October 31, 2019	97 (2)	3,796 (3)	3,893	2,145 (4)	2 (5)	2,147	300 (6)	6,340	

(1) Other changes in goodwill included the effects of translating goodwill denominated in foreign currencies into Canadian dollars and purchase accounting adjustments related to prior-year purchases.

(2) Relates primarily to bcpbank Canada, Diners Club, Aver Media LP and GE Transportation Finance.

(3) Relates primarily to First National Bank & Trust, Ozaukee Bank, Merchants and Manufacturers Bancorporation, Inc., Diners Club, AMCORE, M&I and GE Transportation Finance.

(4) Relates to BMO Nesbitt Burns Inc., Guardian Group of Funds Ltd., Pyrford International Limited, LGM Investments Limited, M&I, myCFO, Inc., Stoker Ostler Wealth Advisors, Inc., CTC Consulting LLC, AWMB and F&C Asset Management plc.

(5) Relates to AIG.

(6) Relates to Gerard Klauer Mattison, BMO Nesbitt Burns Inc., Paloma Securities L.L.C., M&I, Greene Holcomb Fisher and KGS.

Intangible Assets

Intangible assets related to our acquisitions are initially recorded at their fair value at the acquisition date and subsequently at cost less accumulated amortization. Software is recorded at cost less accumulated amortization. Amortization expense is recorded in amortization of intangible assets in our Consolidated Statement of Income. The following table presents the changes in the balance of these intangible assets:

(Canadian \$ in millions)	Customer relationships	Core deposits	Branch distribution networks	Software – amortizing (1)	Software under development	Other	Total
Cost as at October 31, 2017	654	931	187	3,696	398	376	6,242
Additions (disposals)	35	–	–	422	94	12	563
Foreign exchange and other	(1)	20	4	9	4	(4)	32
Cost as at October 31, 2018	688	951	191	4,127	496	384	6,837
Additions (disposals)	–	–	–	718	(91)	30	657
Foreign exchange and other	72	–	–	(9)	(3)	33	93
Cost as at October 31, 2019	760	951	191	4,836	402	447	7,587

(1) Includes \$679 million of internally generated software (\$416 as at October 31, 2018).

The following table presents the accumulated amortization of our intangible assets:

(Canadian \$ in millions)	Customer relationships	Core deposits	Branch distribution networks	Software – amortizing	Software under development	Other	Total
Accumulated amortization at October 31, 2017	431	762	187	2,618	–	85	4,083
Amortization	46	51	–	387	–	19	503
Disposals	–	–	–	(20)	–	–	(20)
Foreign exchange and other	(2)	17	4	(15)	–	(5)	(1)
Accumulated amortization at October 31, 2018	475	830	191	2,970	–	99	4,565
Amortization	60	48	–	395	–	51	554
Disposals	–	–	–	(11)	–	–	(11)
Foreign exchange and other	16	–	–	7	–	32	55
Accumulated amortization at October 31, 2019	551	878	191	3,361	–	182	5,163
Carrying value at October 31, 2019	209	73	–	1,475	402	265	2,424
Carrying value at October 31, 2018	213	121	–	1,157	496	285	2,272

Intangible assets are amortized to income over the period during which we believe the assets will benefit us, on either a straight-line or an accelerated basis, over a period not to exceed 15 years. We have \$168 million as at October 31, 2019 (\$165 million as at October 31, 2018) in intangible assets with indefinite lives that relate primarily to fund management contracts.

The useful lives of intangible assets are reviewed annually for any changes in circumstances. We test definite-life intangible assets for impairment when events or changes in circumstances indicate that their carrying value may not be recoverable. Indefinite-life intangible assets are tested annually for impairment. If any intangible assets are determined to be impaired, we write them down to their recoverable amount, the higher of value in use and fair value less costs to sell.

There were write-downs of software-related intangible assets of \$10 million during the year ended October 31, 2019 (\$13 million in 2018 and \$5 million in 2017).

Note 12: Other Assets

Customers' Liability under Acceptances

Acceptances represent a form of negotiable short-term debt that is issued by our customers, which we guarantee for a fee. The fees earned are recorded in lending fees in our Consolidated Statement of Income over the term of the acceptance. The amount potentially due under acceptances is recorded in other liabilities on our Consolidated Balance Sheet. We record the bank's equivalent claim against our customers in the event of a call on these commitments in other assets on our Consolidated Balance Sheet.

Other

The components of other within other assets are as follows:

(Canadian \$ in millions)	2019	2018
Accounts receivable, prepaid expenses and other items	2,905	2,781
Accrued interest receivable	1,755	1,461
Bank owned life insurance policies	4,242	4,154
Leased vehicles	870	937
Cash collateral	3,517	2,019
Due from clients, dealers and brokers	177	236
Insurance-related assets	1,163	822
Other employee future benefits assets (Note 21)	46	–
Pension asset (Note 21)	186	664
Precious metals (1)	1,719	1,603
Total	16,580	14,677

(1) Precious metals are recorded at their fair value based on quoted prices in active markets.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policies (Note 1).

Note 13: Deposits

(Canadian \$ in millions)	Payable on demand				Payable after notice	Payable on a fixed date (3)		Total		
	Interest bearing		Non-interest bearing			2019	2018	2019	2018	
	2019	2018	2019	2018		2019	2018	2019	2018	
Deposits by:										
Banks (1)	1,996	1,450	1,530	1,400	1,017	526	19,273	24,531	23,816	27,907
Business and government	29,083	25,266	33,853	33,984	85,022	67,026	195,199	185,901	343,157	312,177
Individuals	3,361	3,476	23,084	21,345	94,304	90,233	80,421	65,790	201,170	180,844
Total (2) (4)	34,440	30,192	58,467	56,729	180,343	157,785	294,893	276,222	568,143	520,928
Booked in:										
Canada	27,338	21,735	49,911	47,231	90,630	82,091	181,835	160,069	349,714	311,126
United States	6,043	7,395	8,531	9,477	88,604	74,476	86,368	86,805	189,546	178,153
Other countries	1,059	1,062	25	21	1,109	1,218	26,690	29,348	28,883	31,649
Total	34,440	30,192	58,467	56,729	180,343	157,785	294,893	276,222	568,143	520,928

(1) Includes regulated and central banks.

(2) Includes structured notes designated at fair value through profit or loss.

(3) Includes \$16,248 million of senior unsecured debt as at October 31, 2019 subject to the Bank Recapitalization (Bail-In) regime (\$37 million as at October 31, 2018). The Bail-In regime provides certain statutory powers to the Canada Deposit Insurance Corporation, including the ability to convert specified eligible shares and liabilities into common shares if the bank becomes non-viable.

(4) As at October 31, 2019 and 2018, total deposits payable on a fixed date included \$25,438 million and \$29,673 million, respectively, of federal funds purchased, commercial paper issued and other deposit liabilities. Included in deposits as at October 31, 2019 and 2018 are \$279,860 million and \$259,747 million, respectively, of deposits denominated in U.S. dollars, and \$36,680 million and \$37,427 million, respectively, of deposits denominated in other foreign currencies.

Certain comparative figures have been reclassified to conform with the current year's presentation.

Deposits payable on demand are comprised primarily of our customers' chequing accounts, some of which we pay interest on. Our customers need not notify us prior to withdrawing money from their chequing accounts.

Deposits payable after notice are comprised primarily of our customers' savings accounts, on which we pay interest. Deposits payable on a fixed date are comprised of:

- Various investment instruments purchased by our customers to earn interest over a fixed period, such as term deposits and guaranteed investment certificates. The terms of these deposits can vary from one day to 10 years.
- Federal funds purchased, which are overnight borrowings of other banks' excess reserve funds at the United States Federal Reserve Bank. As at October 31, 2019, we had borrowed \$59 million of federal funds (\$55 million in 2018).
- Commercial paper, which totalled \$9,495 million as at October 31, 2019 (\$9,121 million in 2018).
- Covered bonds, which totalled \$25,465 million as at October 31, 2019 (\$25,045 million in 2018).

The following table presents the maturity schedule for our deposits payable on a fixed date:

(Canadian \$ in millions)	2019	2018
Within 1 year	183,952	162,666
1 to 2 years	34,401	34,154
2 to 3 years	23,855	26,107
3 to 4 years	21,735	16,708
4 to 5 years	16,959	22,196
Over 5 years	13,991	14,391
Total (1)	294,893	276,222

(1) Includes \$273,657 million of deposits, each greater than one hundred thousand dollars, of which \$167,294 million were booked in Canada, \$79,682 million were booked in the United States and \$26,681 million were booked in other countries (\$246,685 million, \$145,574 million, \$71,770 million and \$29,341 million, respectively, in 2018). Of the \$167,294 million of deposits booked in Canada, \$73,027 million mature in less than three months, \$4,312 million mature in three to six months, \$22,814 million mature in six to twelve months and \$67,141 million mature after 12 months (\$145,574 million, \$55,190 million, \$3,836 million, \$12,909 million and \$73,639 million, respectively, in 2018). We have unencumbered liquid assets of \$249,650 million to support these and other deposit liabilities (\$242,612 million in 2018).

Certain comparative figures have been reclassified to conform with the current year's presentation.

Most of our structured note liabilities included in deposits have been designated at fair value through profit or loss, which aligns the accounting result with the way the portfolio is managed. The fair value and notional amount due at contractual maturity of these notes as at October 31, 2019 were \$15,829 million and \$15,431 million, respectively (\$14,186 million and \$15,088 million, respectively, in 2018). The change in fair value of these structured notes was recorded as a decrease of \$1,414 million in non-interest revenue, trading revenues, and an increase of \$114 million before tax was recorded in other comprehensive income related to changes in our own credit spread for the year ended October 31, 2019 (an increase of \$1,038 million recorded in non-interest revenue, trading revenues, and a decrease of \$28 million related to changes in our own credit spread in 2018). The impact of changes in our own credit spread is measured based on movements in our own credit spread year over year.

The cumulative change in fair value related to changes in our own credit spread that has been recognized in other comprehensive income since the notes were designated at fair value to October 31, 2019 was an unrealized loss of approximately \$141 million (unrealized loss of \$255 million in 2018).

Note 14: Other Liabilities

Acceptances

Acceptances represent a form of negotiable short-term debt that is issued by our customers, which we guarantee for a fee. The fees earned are recorded in lending fees in our Consolidated Statement of Income over the term of the acceptance. The amount potentially due under acceptances is recorded in other liabilities on our Consolidated Balance Sheet. We record the bank's equivalent claim against our customers in the event of a call on these commitments in other assets on our Consolidated Balance Sheet.

Securities Lending and Borrowing

Securities lending and borrowing transactions are generally collateralized by securities or cash. Cash advanced or received as collateral is recorded in other assets or other liabilities, respectively. Interest earned on cash collateral is recorded in interest, dividend and fee income in our Consolidated Statement of Income, and interest expense on cash collateral is recorded in interest expense, other liabilities, in our Consolidated Statement of Income. The transfer of the securities to counterparties is only reflected in our Consolidated Balance Sheet if the risks and rewards of ownership have also been transferred. Securities borrowed are not recognized in our Consolidated Balance Sheet unless they are then sold to third parties, in which case the obligation to return the securities is recorded at fair value in securities sold but not yet purchased, with any gains or losses recorded in non-interest revenue, trading revenues.

Securities Sold But Not Yet Purchased

Securities sold but not yet purchased represent our obligations to deliver securities that we did not own at the time of sale. These obligations are recorded at their fair value. Adjustments to the fair value as at the balance sheet date and gains and losses on the settlement of these obligations are recorded in trading revenues in our Consolidated Statement of Income.

Securitization and Structured Entities' Liabilities

Securitization and structured entities' liabilities include notes issued by our consolidated bank securitization vehicles and liabilities associated with the securitization of our Canadian mortgage loans as part of the Canada Mortgage Bond program, the National Housing Act Mortgage-Backed Securities program and our own programs. Additional information on our securitization programs and associated liabilities is provided in Notes 6 and 7. These liabilities are initially measured at fair value plus any directly attributable costs and are subsequently measured at amortized cost. The interest expense related to these liabilities is recorded in interest expense, other liabilities, in our Consolidated Statement of Income.

Other

The components of other within other liabilities are as follows:

(Canadian \$ in millions)	2019	2018
Accounts payable, accrued expenses and other items	8,613	8,152
Accrued interest payable	1,693	1,385
Cash collateral	5,128	5,466
Insurance-related liabilities	11,581	9,585
Liabilities of subsidiaries, other than deposits	7,934	9,283
Other employee future benefits liability (Note 21)	1,125	960
Payable to brokers, dealers and clients	2,204	1,898
Pension liability (Note 21)	329	256
Total	38,607	36,985

Certain comparative figures have been reclassified to conform with the current year's presentation.

Insurance-Related Liabilities

We are engaged in insurance businesses related to life and health insurance, annuities and reinsurance.

We designate the obligation related to certain investment contracts in our insurance business at fair value through profit or loss, which eliminates a measurement inconsistency that would otherwise arise from measuring the investment contract liabilities and offsetting changes in the fair value of the investments supporting them on a different basis. The fair value of these investment contract liabilities as at October 31, 2019 of \$1,043 million (\$800 million as at October 31, 2018) is recorded in other liabilities in our Consolidated Balance Sheet. The change in fair value of these investment contract liabilities resulted in an increase of \$119 million in insurance claims, commissions and changes in policy benefit liabilities for the year ended October 31, 2019 (decrease of \$28 million in 2018). For the year ended October 31, 2019, a loss of \$12 million was recorded in other comprehensive income related to changes in our own credit spread (loss of \$2 million in 2018). The impact of changes in our own credit spread is measured based on movements in our own credit spread year over year. Changes in the fair value of investments backing these investment contract liabilities are recorded in non-interest revenue, insurance revenue. The cumulative change in fair value related to changes in our own credit spread that has been recognized in other comprehensive income since the investment contracts were designated at fair value to October 31, 2019 was an unrealized loss of approximately \$33 million (\$21 million in 2018).

Insurance claims and policy benefit liabilities represent current claims and estimates of future insurance policy benefit liabilities. Liabilities for life insurance contracts are determined using the Canadian Asset Liability Method, which incorporates best-estimate assumptions for mortality, morbidity, policy lapses, surrenders, future investment yields, policy dividends, administration costs and margins for adverse deviation. These assumptions are reviewed at least annually and updated to reflect actual experience and market conditions.

A reconciliation of the change in insurance-related liabilities is as follows:

(Canadian \$ in millions)	2019	2018
Insurance-related liabilities, beginning of year	9,585	8,959
Increase (decrease) in life insurance policy benefit liabilities from:		
New business	706	742
In-force policies	906	(400)
Changes in actuarial assumptions and methodology	23	3
Net increase in life insurance policy benefit liabilities	1,635	345
Change in other insurance-related liabilities	361	281
Insurance-related liabilities, end of year	11,581	9,585

Reinsurance

In the ordinary course of business, our insurance subsidiaries reinsure risks to other insurance and reinsurance companies in order to provide greater diversification, limit loss exposure to large risks, and provide additional capacity for future growth. These ceding reinsurance arrangements do not relieve our insurance subsidiaries of their direct obligation to the insured parties. We evaluate the financial condition of the reinsurers and monitor their credit ratings to minimize our exposure to losses from reinsurer insolvency.

Reinsurance premiums ceded are recorded net against direct premium income and are included in non-interest revenue, insurance revenue, in our Consolidated Statement of Income for the years ended October 31, 2019, 2018 and 2017, as shown in the table below:

(Canadian \$ in millions)	2019	2018	2017
Direct premium income	1,944	1,976	1,750
Ceded premiums	(158)	(148)	(157)
	1,786	1,828	1,593

Note 15: Subordinated Debt

Subordinated debt represents our direct unsecured obligations to our debt holders, in the form of notes and debentures, and forms part of our regulatory capital. Subordinated debt is recorded at amortized cost using the effective interest rate method. Where appropriate, we enter into fair value hedges to hedge the risks caused by changes in interest rates (see Note 8). The rights of the holders of our notes and debentures are subordinate to the claims of depositors and certain other creditors. We require approval from OSFI before we can redeem any part of our subordinated debt.

The face values, terms to maturity and carrying values of our subordinated debt are as follows:

(Canadian \$ in millions, except as noted)	Face value	Maturity date	Interest rate (%)	Redeemable at our option	2019 Total	2018 Total
Debentures Series 20	150	December 2025 to 2040	8.25	Not redeemable	145	143
Series H Medium-Term Notes, First Tranche (8)	1,000	September 2024	3.12	September 2019 (1)	-	1,003
Series H Medium-Term Notes, Second Tranche (8)	1,000	December 2025	3.34	December 2020 (2)	983	916
Series I Medium-Term Notes, First Tranche (8)	1,250	June 2026	3.32	June 2021 (3)	1,230	1,222
Series I Medium-Term Notes, Second Tranche (8)	850	June 2027	2.57	June 2022 (4)	820	813
3.803% Subordinated Notes due 2032 (8)	US 1,250	December 2032	3.80	December 2027 (5)	1,646	1,573
4.338% Subordinated Notes due 2028 (8)	US 850	October 2028	4.34	October 2023 (6)	1,180	1,112
Series J Medium-Term Notes, First Tranche (8)(9)	1,000	September 2029	2.88	September 2024 (7)	991	-
Total (10)					6,995	6,782

- (1) All \$1,000 million Series H Medium-Term Notes, First Tranche were redeemed on September 19, 2019 for 100% of the principal amount, plus accrued and unpaid interest to, but excluding, the redemption date.
- (2) Redeemable at the greater of par and the Canada Yield Price prior to December 8, 2020, and redeemable at par together with accrued and unpaid interest to, but excluding, their redemption date commencing December 8, 2020.
- (3) Redeemable at the greater of par and the Canada Yield Price prior to June 1, 2021, and redeemable at par together with accrued and unpaid interest to, but excluding, their redemption date commencing June 1, 2021.
- (4) Redeemable at the greater of par and the Canada Yield Price prior to June 1, 2022, and redeemable at par together with accrued and unpaid interest to, but excluding, their redemption date commencing June 1, 2022.
- (5) Redeemable at par on December 15, 2027 together with accrued and unpaid interest to, but excluding, the redemption date.
- (6) Redeemable at par on October 5, 2023 together with accrued and unpaid interest to, but excluding, the redemption date.
- (7) Redeemable at par on September 17, 2024 together with accrued and unpaid interest to, but excluding, the redemption date.
- (8) These notes include a non-viability contingent capital provision, which is necessary for notes issued after a certain date to qualify as regulatory capital under Basel III. As such, they are convertible into a variable number of our common shares if OSFI announces that the bank is, or is about to become, non-viable or if a federal or provincial government in Canada publicly announces that the bank has accepted or agreed to accept a capital injection, or equivalent support, to avoid non-viability. In such an event, each note is convertible into common shares pursuant to an automatic conversion formula with a multiplier 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 TSX. The number of common 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 applying the multiplier.
- (9) On September 16, 2019, we issued \$1,000 million of Series J Medium — Term Notes, First Tranche.
- (10) Certain amounts of subordinated debt were issued at a premium or discount and include fair value hedge adjustments, which together decreased their carrying value as at October 31, 2019 by \$20 million (decreased by \$233 million in 2018); see Note 8 for further details for hedge adjustments. The carrying value is also adjusted for our subordinated debt holdings, held for market making purposes.

The aggregate remaining maturities of our subordinated debt, based on the maturity dates under the terms of issue, can be found in the blue-tinted font in the Contractual Maturities of Assets and Liabilities and Off-Balance Sheet Commitments section of Management's Discussion and Analysis on pages 98 to 99 of this report.

Note 16: Equity

Preferred and Common Shares Outstanding and Other Equity Instruments

(Canadian \$ in millions, except as noted)

	2019			2018		
	Number of shares	Amount	Dividends declared per share	Number of shares	Amount	Dividends declared per share
Preferred Shares – Classified as Equity						
Class B – Series 16 (1)	-	-	-	-	-	0.64
Class B – Series 17 (2)	-	-	-	-	-	0.52
Class B – Series 25	9,425,607	236	0.45	9,425,607	236	0.45
Class B – Series 26	2,174,393	54	0.70	2,174,393	54	0.59
Class B – Series 27	20,000,000	500	0.98	20,000,000	500	1.00
Class B – Series 29	16,000,000	400	0.96	16,000,000	400	0.98
Class B – Series 31	12,000,000	300	0.95	12,000,000	300	0.95
Class B – Series 33	8,000,000	200	0.95	8,000,000	200	0.95
Class B – Series 35	6,000,000	150	1.25	6,000,000	150	1.25
Class B – Series 36	600,000	600	58.50	600,000	600	58.50
Class B – Series 38	24,000,000	600	1.21	24,000,000	600	1.21
Class B – Series 40	20,000,000	500	1.13	20,000,000	500	1.13
Class B – Series 42	16,000,000	400	1.10	16,000,000	400	1.10
Class B – Series 44 (3)	16,000,000	400	1.44	16,000,000	400	-
Class B – Series 46 (4)	14,000,000	350	0.77	-	-	-
Preferred Shares – Classified as Equity		4,690			4,340	
Other Equity Instruments (5)		658			-	
Preferred Shares and Other Equity Instruments		5,348			4,340	
Common Shares						
Balance at beginning of year	639,329,625	12,929		647,816,318	13,032	
Issued under the Shareholder Dividend Reinvestment and Share Purchase Plan	-	-		-	-	
Issued/cancelled under the Stock Option Plan and other stock-based compensation plans (Note 20)	902,651	62		1,513,307	99	
Repurchased for cancellation	(1,000,000)	(20)		(10,000,000)	(202)	
Balance at End of Year	639,232,276	12,971	4.06	639,329,625	12,929	3.78

- (1) On August 25, 2018, we redeemed all 6,267,391 Non-Cumulative Perpetual Class B Preferred Shares, Series 16, at a price of \$25.00 cash per share plus all declared and unpaid dividends. Dividends declared for the year ended October 31, 2018 were \$0.64 per share and 6,267,391 shares were outstanding at the time of the dividend declaration.
- (2) On August 25, 2018, we redeemed all 5,732,609 Non-Cumulative Perpetual Class B Preferred Shares, Series 17, at a price of \$25.00 cash per share plus all declared and unpaid dividends. Dividends declared for the year ended October 31, 2018 were \$0.52 per share and 5,732,609 shares were outstanding at the time of the dividend declaration.
- (3) On September 17, 2018, we issued 16 million Non-Cumulative 5-Year Rate Reset Class B Preferred Shares, Series 44, at a price of \$25.00 cash per share for gross proceeds of \$400 million.
- (4) On April 17, 2019, we issued 14 million Non-Cumulative 5-Year Rate Reset Class B Preferred Shares, Series 46, at a price of \$25.00 cash per share for gross proceeds of \$350 million.
- (5) On July 30, 2019, we issued US\$500 million 4.800% Additional Tier 1 Capital Notes.

Preferred Share Rights and Privileges

(Canadian \$, except as noted)

	Redemption amount	Quarterly non-cumulative dividend (1)	Reset premium	Date redeemable / convertible	Convertible to
Class B – Series 25	25.00	\$0.112813 (2)	1.15%	August 25, 2021 (3)(4)	Class B – Series 26 (8)
Class B – Series 26	25.00	Floating (7)	1.15%	August 25, 2021 (3)(5)	Class B – Series 25 (8)
Class B – Series 27	25.00	\$ 0.24075 (2)	2.33%	May 25, 2024 (3)(4)	Class B – Series 28 (8)(9)
Class B – Series 29	25.00	\$ 0.2265 (2)	2.24%	August 25, 2024 (3)(4)	Class B – Series 30 (8)(9)
Class B – Series 31	25.00	\$ 0.2375 (2)	2.22%	November 25, 2019 (3)(4)	Class B – Series 32 (8)(9)
Class B – Series 33	25.00	\$ 0.2375 (2)	2.71%	August 25, 2020 (3)(4)	Class B – Series 34 (8)(9)
Class B – Series 35	25.00	\$ 0.3125	Does not reset	August 25, 2020 (6)	Not convertible (9)
Class B – Series 36	1,000.00	\$ 14.6250 (2)	4.97%	November 25, 2020 (3)(4)	Class B – Series 37 (8)(9)
Class B – Series 38	25.00	\$0.303125 (2)	4.06%	February 25, 2022 (3)(4)	Class B – Series 39 (8)(9)
Class B – Series 40	25.00	\$ 0.28125 (2)	3.33%	May 25, 2022 (3)(4)	Class B – Series 41 (8)(9)
Class B – Series 42	25.00	\$ 0.2750 (2)	3.17%	August 25, 2022 (3)(4)	Class B – Series 43 (8)(9)
Class B – Series 44	25.00	\$0.303125 (2)	2.68%	November 25, 2023 (3)(4)	Class B – Series 45 (8)(9)
Class B – Series 46	25.00	\$ 0.31875 (2)	3.51%	May 25, 2024 (3)(4)	Class B – Series 47 (8)(9)

- (1) Non-cumulative dividends are payable quarterly as and when declared by the Board of Directors.
- (2) The dividend rate will reset on the date redeemable and every five years thereafter at a rate equal to the 5-year Government of Canada bond yield plus the reset premium noted. If converted to a floating rate series, the rate will be set as, and when declared, at the 3-month Government of Canada treasury bill yield plus the reset premium noted.
- (3) Redeemable on the date noted and every five years thereafter.
- (4) Convertible on the date noted and every five years thereafter if not redeemed. If converted, the shares will become floating rate preferred shares.
- (5) Convertible on the date noted and every five years thereafter if not redeemed. If converted, the shares will become fixed rate preferred shares.
- (6) Series 35 is subject to a redemption premium if redeemed prior to August 25, 2024.
- (7) Floating rate will be set as, and when declared, at the 3-month Government of Canada treasury bill yield plus a reset premium.
- (8) If converted, the holders have the option to convert back to the original preferred shares on subsequent redemption dates.
- (9) The shares issued include a non-viability contingent capital provision, which is necessary for the shares to qualify as regulatory capital under Basel III. Refer to the Non-Viability Contingent Capital paragraph below for details.

On September 27, 2019, we announced that we did not intend to exercise our right to redeem the currently outstanding Non-Cumulative 5-Year Rate Reset Class B Preferred Shares Series 31 ("Preferred Shares Series 31") on November 25, 2019. As a result, subject to certain conditions, the holders of Preferred Shares Series 31 had the right, at their option, by November 12, 2019, to convert any or all of their Preferred Shares Series 31 on a one-for-one basis into Non-Cumulative Floating Rate Class B Preferred Shares Series 32 ("Preferred Shares Series 32"). During the conversion period, which ran from October 28, 2019 to November 12, 2019, 69,570 Preferred Shares Series 31 were tendered for conversion into Preferred Shares Series 32, which is less than the minimum 1,000,000 required to give effect to the conversion, as described in the Preferred Shares Series 31 prospectus supplement dated July 23, 2014. As a result, no Preferred Shares Series 32 were issued and holders of Preferred Shares Series 31 retained their shares. The dividend rate for the Preferred Shares Series 31 for the five-year period commencing on November 25, 2019, and ending on November 24, 2024, will be 3.851%.

On June 27, 2019, we announced that we did not intend to exercise our right to redeem the currently outstanding Non-Cumulative 5-Year Rate Reset Class B Preferred Shares Series 29 ("Preferred Shares Series 29") on August 25, 2019. As a result, subject to certain conditions, the holders of Preferred Shares Series 29 had the right, at their option, by August 12, 2019, to convert any or all of their Preferred Shares Series 29 on a one-for-one basis into Non-Cumulative Floating Rate Class B Preferred Shares Series 30 ("Preferred Shares Series 30"). During the conversion period, which ran from July 26, 2019 to August 12, 2019, 223,098 Preferred Shares Series 29 were tendered for conversion into Preferred Shares Series 30, which is less than the minimum 1,000,000 required to give effect to the conversion, as described in the Preferred Shares Series 29 prospectus supplement dated May 30, 2014. As a result, no Preferred Shares Series 30 were issued and holders of Preferred Shares Series 29 retained their shares. The dividend rate for the Preferred Shares Series 29 for the five-year period commencing on August 25, 2019, and ending on August 24, 2024, will be 3.624%.

On April 17, 2019, we issued 14 million Non-Cumulative 5-Year Rate Reset Class B Preferred Shares Series 46 (Non-Viability Contingent Capital ("NVCC")), at a price of \$25 per share, for gross proceeds of \$350 million. For the initial five-year period to the earliest redemption date of May 25, 2024, the shares pay quarterly cash dividends, if declared, at a rate of 5.1% per annum. 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 a premium of 3.51%. Holders have the option to convert their shares into an equal number of Non-Cumulative Floating Rate Class B Preferred Shares Series 47 ("Preferred Shares Series 47"), subject to certain conditions, on the earliest redemption date and every fifth year thereafter. Holders of Preferred Shares Series 47 will be entitled to receive non-cumulative preferential floating rate quarterly dividends, as and when declared, equal to the 3-month Government of Canada Treasury Bill yield plus 3.51%.

On March 29, 2019, we announced that we did not intend to exercise our right to redeem the currently outstanding Non-Cumulative 5-Year Rate Reset Class B Preferred Shares Series 27 ("Preferred Shares Series 27") on May 25, 2019. As a result, subject to certain conditions, the holders of Preferred Shares Series 27 had the right, at their option, by May 10, 2019, to convert any or all of their Preferred Shares Series 27 on a one-for-one basis into Non-Cumulative Floating Rate Class B Preferred Shares Series 28 ("Preferred Shares Series 28"). During the conversion period, which ran from April 25, 2019 to May 10, 2019, 412,564 Preferred Shares Series 27 were tendered for conversion into Preferred Shares Series 28, which is less than the minimum 1,000,000 required to give effect to the conversion, as described in the Preferred Shares Series 27 prospectus supplement dated April 16, 2014. As a result, no Preferred Shares Series 28 were issued and holders of Preferred Shares Series 27 retained their shares. The dividend rate for the Preferred Shares Series 27 for the five-year period commencing on May 25, 2019, and ending on May 24, 2024, will be 3.852%.

Other Equity Instruments

On July 30, 2019, we issued US\$500 million 4.800% Additional Tier 1 Capital Notes (Non-Viability Contingent Capital ("NVCC")) ("notes"), which are classified as equity and form part of our additional Tier 1 non-viability contingent capital. The notes are compound financial instruments that have both equity and liability features. On the date of issuance, we assigned an insignificant value to the liability component of the notes and, as a result, the full amount of proceeds has been classified as equity. Semi-annual distributions on the notes will be recorded when payable. The rights of the holders of our notes are subordinate to the claims of the depositors and certain other creditors, but rank above our common and preferred shares.

(Canadian \$, in millions, except as noted)					2019	2018
	Face value	Interest rate (%)	Redeemable at our option	Convertible to	Total	Total
4.800% Additional Tier 1 Capital Notes	US\$500	4.800 (1)	August 2024 (2)	Variable number of common shares (3)	658	-
Total					658	-

(1) Non-cumulative interest is payable semi-annually in arrears, at the bank's discretion.

(2) The notes are redeemable at a redemption price equal to 100% of the principal amount plus any accrued and unpaid interest, in whole or in part, at our option on any interest payment date on or after the first interest reset date in 2024 or following certain regulatory or tax events. The bank may, at any time, purchase the notes at any price in the open market.

(3) The notes issued include a non-viability contingent capital provision, which is necessary for the notes to qualify as regulatory capital under Basel III. Refer to the Non-Viability Contingent Capital paragraph below for details.

Authorized Share Capital

We classify financial instruments that we issue as financial liabilities, equity instruments or compound instruments. Financial instruments that will be settled by a variable number of our common shares upon conversion by the holders are classified as liabilities on our Consolidated Balance Sheet. Dividends and interest payments on financial liabilities are classified as interest expense in our Consolidated Statement of Income. Financial instruments are classified as equity instruments when there is no contractual obligation to transfer cash or other financial assets. Further, issued instruments that are not mandatorily redeemable, or that are not convertible into a variable number of our common shares at the holder's option, are classified as equity and presented in share capital. Dividend payments on equity instruments are recognized as a reduction in equity.

Common Shares

We are authorized by our shareholders to issue an unlimited number of our common shares, without par value, for unlimited consideration. Our common shares are not redeemable or convertible. Dividends are declared by our Board of Directors at their discretion. Historically, the Board of Directors has declared dividends on a quarterly basis and the amount can vary from quarter to quarter.

Preferred Shares

We are authorized by our shareholders to issue an unlimited number of Class A Preferred Shares and Class B Preferred Shares, without par value, in series, for unlimited consideration. Class B Preferred Shares may be issued in a foreign currency.

Treasury Shares

When we purchase our common shares as part of our trading business, we record the cost of those shares as a reduction in shareholders' equity. If those shares are resold at a price higher than their cost, the premium is recorded as an increase in contributed surplus. If those shares are resold at a price below their cost, the discount is recorded as a reduction first to contributed surplus and then to retained earnings for any amount in excess of the total contributed surplus related to treasury shares.

Non-Viability Contingent Capital

Class B – Series 27, Class B – Series 29, Class B – Series 31, Class B – Series 33, Class B – Series 35, Class B – Series 36, Class B – Series 38, Class B – Series 40, Class B – Series 42, Class B – Series 44 and Class B – Series 46 preferred share issues and the other equity instruments include a non-viability contingent capital provision, which is necessary for them to qualify as regulatory capital under Basel III. As such, they are convertible into a variable number of our common shares if OSFI announces that the bank is, or is about to become, non-viable or if a federal or provincial government in Canada publicly announces that the bank has accepted, or agreed to accept, a capital injection, or equivalent support, to avoid non-viability. In such an event, each preferred share or other equity instrument is convertible into common shares pursuant to an automatic conversion formula 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 TSX. The number of common shares issued is determined by dividing the value of the preferred share or other equity instrument issuance (including declared and unpaid dividends on such preferred share or other equity instrument issuance) by the conversion price and then applying the multiplier.

Normal Course Issuer Bid

We renewed our normal course issuer bid ("NCIB"), effective June 3, 2019 for one year. Under this NCIB, we may purchase up to 15 million of our common shares for cancellation. The timing and amount of purchases under the NCIB are subject to management discretion based on factors such as market conditions and capital levels. The bank will consult with OSFI before making purchases under the NCIB.

During the year ended October 31, 2019, we purchased for cancellation 1 million of our common shares (10 million in 2018).

Share Redemption and Dividend Restrictions

OSFI must approve any plan to redeem any of our preferred share issues or other equity instruments for cash.

We are prohibited from declaring dividends on our preferred or common shares when we would be, as a result of paying such a dividend, in contravention of the capital adequacy, liquidity or any other regulatory directive issued under the *Bank Act (Canada)*. In addition, common share dividends cannot be paid unless all dividends declared and payable on our preferred shares have been paid or sufficient funds have been set aside to do so.

In addition, if the bank does not pay the interest in full on the Additional Tier 1 Capital Notes, the bank will not declare dividends on its common shares or preferred shares or redeem, purchase or otherwise retire such shares until the month commencing after the bank resumes full interest payments on the Additional Tier 1 Capital Notes.

Currently, these limitations do not restrict the payment of dividends on common or preferred shares.

Shareholder Dividend Reinvestment and Share Purchase Plan

We offer a Dividend Reinvestment and Share Purchase Plan ("DRIP") for our shareholders. Participation in the plan is optional. Under the terms of the DRIP, cash dividends on common shares are reinvested to purchase additional common shares. Shareholders also have the opportunity to make optional cash payments to acquire additional common shares.

For dividends paid in fiscal 2019 and 2018, common shares to supply the DRIP were purchased in the open market.

During the year ended October 31, 2019, we did not issue any common shares from treasury (nil in 2018) and purchased 2,198,109 common shares in the open market (1,995,353 in 2018) for delivery to shareholders under the DRIP.

Potential Share Issuances

As at October 31, 2019, we had reserved 39,947,147 common shares (39,947,147 in 2018) for potential issuance in respect of the DRIP. We have also reserved 6,108,307 common shares (6,095,201 in 2018) for the potential exercise of stock options, as further described in Note 20.

Capital Trust Securities

On December 31, 2018, BMO Capital Trust II redeemed all of its issued and outstanding BMO Tier 1 Notes – Series A at a redemption amount equal to \$1,000 for an aggregate redemption of \$450 million, plus accrued and unpaid interest to but excluding the redemption date.

Note 17: Fair Value of Financial Instruments and Trading-Related Revenue

We record trading assets and liabilities, derivatives, certain equity and debt securities and securities sold but not yet purchased at fair value, and other non-trading assets and liabilities at amortized cost less allowances or write-downs for impairment. The fair values presented in this note are based upon the amounts estimated for individual assets and liabilities and do not include an estimate of the fair value of any of the legal entities or underlying operations that comprise our business. For certain portfolios of financial instruments where we manage exposures to similar and offsetting risks, fair value is determined on the basis of our net exposure to that risk.

Fair value represents the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between willing market participants at the measurement date. The fair value amounts disclosed represent point-in-time estimates that may change in subsequent reporting periods due to changes in market conditions or other factors. Some financial instruments are not typically exchangeable or exchanged and therefore it is difficult to determine their fair value. Where there is no quoted market price, we determine fair value using management's best estimates based on a range of valuation techniques and assumptions; since these involve uncertainties, the fair values may not be realized in an actual sale or immediate settlement of the asset or liability.

Governance Over the Determination of Fair Value

Senior executive oversight of our valuation processes is provided through various valuation and risk committees. In order to ensure that all financial instruments carried at fair value are reasonably measured for risk management and financial reporting purposes, we have established governance structures and controls, such as model validation and approval, independent price verification (“IPV”) and profit or loss attribution analysis (“PAA”), consistent with industry practice. These controls are applied independently of the relevant operating groups.

We establish valuation methodologies for each financial instrument that is required to be measured at fair value. The application of valuation models for products or portfolios is subject to independent approval to ensure only validated models are used. The impact of known limitations of models and data inputs is also monitored on an ongoing basis. IPV is a process that regularly and independently verifies the accuracy and appropriateness of market prices or model inputs used in the valuation of financial instruments. This process assesses fair values using a variety of different approaches to verify and validate the valuations. PAA is a daily process carried out by management to identify and explain changes in fair value positions across all operating lines of business within BMO Capital Markets. This process works in concert with other processes to ensure that the fair values being reported are reasonable and appropriate.

Securities

For traded securities, quoted market value is considered to be fair value. Quoted market value is based on bid or ask prices, depending on which is the most appropriate to measure fair value. Securities for which no active market exists are valued using all reasonably available market information. Our fair value methodologies are described below.

Government Securities

The fair value of government issued or guaranteed debt securities in active markets is determined by reference to recent transaction prices, broker quotes or third-party vendor prices. The fair value of securities that are not traded in an active market is modelled using implied yields derived from the prices of similar actively traded government securities and observable spreads. Market inputs to the model include coupon, maturity and duration.

Mortgage-Backed Securities and Collateralized Mortgage Obligations

The fair value of mortgage-backed securities and collateralized mortgage obligations is determined using prices obtained from independent third-party vendors, broker quotes and relevant market indices, as applicable. If such prices are not available, fair value is determined using cash flow models that make maximum use of observable market inputs or benchmark prices for similar instruments. Valuation assumptions for mortgage-backed securities and collateralized mortgage obligations include discount rates, expected prepayments, credit spreads and recoveries.

Corporate Debt Securities

The fair value of corporate debt securities is determined using prices observed in the most recent transactions. When observable price quotations are not available, fair value is determined based on discounted cash flow models using discounting curves and spreads obtained from independent dealers, brokers and multi-contributor pricing sources.

Trading Loans

The fair value of trading loans is determined by referring to current market prices for the same or similar instruments.

Corporate Equity Securities

The fair value of corporate equity securities is based on quoted prices in active markets, where available. Where quoted prices in active markets are not readily available, fair value is determined using either quoted market prices for similar securities or using valuation techniques, which include discounted cash flow analysis and earnings multiples.

Privately Issued Securities

Privately issued debt and equity securities are valued using prices observed in recent market transactions, where available. Otherwise, fair value is derived from valuation models using a market or income approach. These models consider various factors, including projected cash flows, earnings, revenue and other third-party evidence, as available. The fair value of limited partnership investments is based on net asset values published by third-party fund managers.

Prices from brokers and multi-contributor pricing sources are corroborated as part of our independent review process, which may include using valuation techniques or obtaining consensus or composite prices from other pricing services. We validate the estimates of fair value by independently obtaining multiple quotes for external market prices and input values. We review the approach taken by third-party vendors to ensure that vendors employ a valuation model that maximizes the use of observable inputs such as benchmark yields, bid-ask spreads, underlying collateral, weighted-average terms to maturity and prepayment rate assumptions. Fair value estimates from internal valuation techniques are verified, where possible, by reference to prices obtained from third-party vendors.

Loans

In determining the fair value of our fixed rate performing loans, other than credit card loans, we discount the remaining contractual cash flows, adjusted for estimated prepayment, at market interest rates currently offered for loans with similar terms and risks. For credit card performing loans, fair value is considered to be equal to carrying value, due to their short-term nature.

For floating rate performing loans, changes in interest rates have minimal impact on fair value since interest rates are repriced or reset frequently. On that basis, fair value is assumed to be equal to carrying value.

The fair value of loans is not adjusted for the value of any credit protection purchased to mitigate credit risk.

Derivative Instruments

A number of valuation techniques are employed to estimate fair value, including discounted cash flow analysis, the Black-Scholes model, Monte Carlo simulation and other accepted market models. These independently validated models incorporate current market data for interest rates, foreign currency exchange rates, equity and commodity prices and indices, credit spreads, recovery rates, corresponding market volatility levels, spot prices, correlation levels and other market-based pricing factors. Option implied volatilities, an input into many valuation models, are either obtained directly from market sources or calculated from market prices. Multi-contributor pricing sources are used wherever possible.

In determining the fair value of complex and customized derivatives, we consider all reasonably available information, including dealer and broker quotations, multi-contributor pricing sources and any relevant observable market inputs. Our model calculates fair value based on inputs specific to the type of contract, which may include stock prices, correlation for multiple assets, interest rates, foreign currency exchange rates, yield curves and volatilities.

We calculate a credit valuation adjustment (“CVA”) to recognize the bilateral risk that either counterparty to a given derivative may not ultimately be able to fulfill its obligations. The CVA is derived from market-observed credit spreads or proxy credit spreads and our assessment of the net counterparty credit risk exposure, taking into account credit mitigants such as collateral, master netting agreements and novation to central counterparties. We also calculate a funding valuation adjustment (“FVA”) to recognize the implicit funding costs associated with over-the-counter derivative positions. The FVA is determined by reference to market funding spreads.

Deposits

In determining the fair value of our deposits, we incorporate the following assumptions:

- For fixed rate, fixed maturity deposits, we discount the remaining contractual cash flows related to these deposits, adjusted for expected redemptions, at market interest rates currently offered for deposits with similar terms and risks. The fair value of our senior note liabilities and covered bonds is determined by referring to current market prices for similar instruments or using valuation techniques, such as discounted cash flow models that use market interest rate yield curves and funding spreads.
- For fixed rate deposits with no defined maturities, we consider fair value to equal carrying value, since carrying value is equivalent to the amount payable on the reporting date.
- For floating rate deposits, changes in interest rates have minimal impact on fair value, since deposits reprice to market frequently. On that basis, fair value is considered to equal carrying value.

Certain of our structured note liabilities that have coupons or repayment terms linked to the performance of interest rates, foreign currencies, commodities or equity securities have been designated at fair value through profit or loss. The fair value of these structured notes is estimated using internally validated valuation models and incorporates observable market prices for identical or comparable securities, as well as other inputs, such as interest rate yield curves, option volatilities and foreign exchange rates, where appropriate. Where observable prices or inputs are not available, management judgment is required to determine the fair value by assessing other relevant sources of information, such as historical data and proxy information from similar transactions.

Securities Sold But Not Yet Purchased

The fair value of these obligations is based on the fair value of the underlying securities, which can be equity or debt securities. As these obligations are fully collateralized, the method used to determine fair value would be the same as that used for the relevant underlying equity or debt securities.

Securitization and Structured Entities’ Liabilities

The determination of the fair value of our securitization and structured entities’ liabilities is based on quoted market prices or quoted market prices for similar financial instruments, where available. Where quoted prices are not available, fair value is determined using valuation techniques, such as discounted cash flow models that maximize the use of observable inputs.

Subordinated Debt

The fair value of our subordinated debt is determined by referring to current market prices for the same or similar instruments.

Financial Instruments with a Carrying Value Approximating Fair Value

Short-term and Other Financial Instruments

Carrying value is considered to be a reasonable estimate of fair value for our cash and cash equivalents.

The carrying value of certain financial assets and liabilities, such as interest bearing deposits with banks, securities borrowed or purchased under resale agreements, customers’ liability under acceptances, other assets, acceptances, securities lent or sold under repurchase agreements and other liabilities, is a reasonable estimate of fair value due to their short-term nature or because they are frequently repriced to current market rates.

Certain assets, including premises and equipment, goodwill and intangible assets, as well as shareholders’ equity, are not financial instruments and therefore no fair value has been determined for these items.

Fair Value Hierarchy

We use a fair value hierarchy to categorize financial instruments according to the inputs we use in valuation techniques to measure fair value.

Fair Value of Financial Instruments Not Carried at Fair Value on the Balance Sheet

Set out in the following tables are the fair values of financial instruments not carried at fair value on our Consolidated Balance Sheet.

(Canadian \$ in millions)

	2019				
	Carrying value	Fair value	Valued using quoted market prices	Valued using models (with observable inputs)	Valued using models (without observable inputs)
Securities					
Amortized cost	24,472	24,622	13,612	11,010	-
Loans (1)					
Residential mortgages	123,676	124,093	-	124,093	-
Consumer instalment and other personal	67,200	67,516	-	67,516	-
Credit cards	8,623	8,623	-	8,623	-
Business and government (2)	224,442	225,145	-	225,145	-
	423,941	425,377	-	425,377	-
Deposits (3)	552,314	553,444	-	553,444	-
Securitization and structured entities' liabilities	27,159	27,342	-	27,342	-
Subordinated debt	6,995	7,223	-	7,223	-

(1) Carrying value of loans is net of allowance.

(2) Excludes \$2,156 million of loans classified as FVTPL and \$22 million of loans classified as FVOCI.

(3) Excludes \$15,829 million of structured note liabilities designated at FVTPL and accounted for at fair value.

This table excludes certain financial instruments with a carrying value approximating fair value, such as cash and cash equivalents, interest bearing deposits with banks, securities borrowed or purchased under resale agreements, customers' liability under acceptances, other assets, acceptances, securities lent or sold under repurchase agreements and other liabilities.

(Canadian \$ in millions)

	2018				
	Carrying value	Fair value	Valued using quoted market prices	Valued using models (with observable inputs)	Valued using models (without observable inputs)
Securities					
Amortized cost	6,485	6,288	429	5,795	64
Loans (1)					
Residential mortgages	119,544	118,609	-	118,609	-
Consumer instalment and other personal	62,687	62,618	-	62,618	-
Credit cards	8,099	8,099	-	8,099	-
Business and government (2)	192,225	191,989	-	191,989	-
	382,555	381,315	-	381,315	-
Deposits (3)	506,742	506,581	-	506,581	-
Securitization and structured entities' liabilities	25,051	24,838	-	24,838	-
Subordinated debt	6,782	6,834	-	6,834	-

(1) Carrying value of loans is net of allowance.

(2) Excludes \$1,450 million of loans classified as FVTPL.

(3) Excludes \$14,186 million of structured note liabilities designated at FVTPL and accounted for at fair value.

This table excludes certain financial instruments with a carrying value approximating fair value, such as cash and cash equivalents, interest bearing deposits with banks, securities borrowed or purchased under resale agreements, customers' liability under acceptances, other assets, acceptances, securities lent or sold under repurchase agreements and other liabilities.

Valuation Techniques and Significant Inputs

We determine the fair value of publicly traded fixed maturity debt and equity securities using quoted prices in active markets (Level 1) when these are available. When quoted prices in active markets are not available, we determine the fair value of financial instruments using models such as discounted cash flows, with observable market data for inputs, such as yield and prepayment rates or broker quotes and other third-party vendor quotes (Level 2). Fair value may also be determined using models where significant market inputs are not observable due to inactive markets or minimal market activity (Level 3). We maximize the use of observable market inputs to the extent possible.

Our Level 2 trading securities are primarily valued using discounted cash flow models with observable spreads or broker quotes. The fair value of Level 2 FVOCI securities is determined using discounted cash flow models with observable spreads or third-party vendor quotes. Level 2 structured note liabilities are valued using models with observable market information. Level 2 derivative assets and liabilities are valued using industry-standard models and observable market information.

The extent of our use of actively quoted market prices (Level 1), internal models using observable market information as inputs (Level 2) and models without observable market information as inputs (Level 3) in the valuation of securities, business and government loans classified as FVTPL, fair value liabilities, derivative assets and derivative liabilities is presented in the following table:

(Canadian \$ in millions)	2019				2018			
	Valued using quoted market prices	Valued using models (with observable inputs)	Valued using models (without observable inputs)	Total	Valued using quoted market prices	Valued using models (with observable inputs)	Valued using models (without observable inputs)	Total
Trading Securities								
Issued or guaranteed by:								
Canadian federal government	6,959	1,371	-	8,330	9,107	1,213	-	10,320
Canadian provincial and municipal governments	3,871	3,656	-	7,527	4,013	4,689	-	8,702
U.S. federal government	8,001	762	-	8,763	9,465	52	-	9,517
U.S. states, municipalities and agencies	48	626	-	674	78	1,138	-	1,216
Other governments	888	697	-	1,585	1,210	201	-	1,411
NHA MBS and U.S. agency MBS and CMO	14	10,494	538	11,046	60	8,869	255	9,184
Corporate debt	2,620	5,091	7	7,718	2,973	6,218	7	9,198
Trading loans	-	103	-	103	-	199	-	199
Corporate equity	40,155	2	-	40,157	49,946	4	-	49,950
	62,556	22,802	545	85,903	76,852	22,583	262	99,697
FVTPL Securities								
Issued or guaranteed by:								
Canadian federal government	410	107	-	517	328	103	-	431
Canadian provincial and municipal governments	364	915	-	1,279	219	727	-	946
U.S. federal government	-	48	-	48	69	-	-	69
Other governments	-	49	-	49	-	-	-	-
NHA MBS and U.S. agency MBS and CMO	-	5	-	5	-	7	-	7
Corporate debt	146	8,071	-	8,217	178	6,643	-	6,821
Corporate equity	1,536	69	1,984	3,589	1,378	134	1,825	3,337
	2,456	9,264	1,984	13,704	2,172	7,614	1,825	11,611
FVOCI Securities								
Issued or guaranteed by:								
Canadian federal government	11,168	776	-	11,944	11,978	827	-	12,805
Canadian provincial and municipal governments	3,798	2,214	-	6,012	3,315	3,547	-	6,862
U.S. federal government	15,068	907	-	15,975	16,823	-	-	16,823
U.S. states, municipalities and agencies	1	4,159	1	4,161	14	3,640	1	3,655
Other governments	4,396	2,939	-	7,335	3,143	1,647	-	4,790
NHA MBS and U.S. agency MBS and CMO	-	14,000	-	14,000	-	13,687	-	13,687
Corporate debt	2,205	2,802	-	5,007	1,959	1,797	-	3,756
Corporate equity	-	-	81	81	-	-	62	62
	36,636	27,797	82	64,515	37,232	25,145	63	62,440
Business and Government Loans								
	-	442	1,736	2,178	-	-	1,450	1,450
Fair Value Liabilities								
Securities sold but not yet purchased	22,393	3,860	-	26,253	26,336	2,468	-	28,804
Structured note liabilities and other note liabilities	-	15,829	-	15,829	-	14,186	-	14,186
Annuity liabilities	-	1,043	-	1,043	-	800	-	800
	22,393	20,732	-	43,125	26,336	17,454	-	43,790
Derivative Assets								
Interest rate contracts	14	10,443	-	10,457	18	8,177	-	8,195
Foreign exchange contracts	7	9,262	-	9,269	16	12,983	-	12,999
Commodity contracts	329	817	-	1,146	166	1,894	-	2,060
Equity contracts	226	997	-	1,223	286	1,872	-	2,158
Credit default swaps	-	49	-	49	-	10	-	10
	576	21,568	-	22,144	486	24,936	-	25,422
Derivative Liabilities								
Interest rate contracts	11	7,943	-	7,954	14	7,838	-	7,852
Foreign exchange contracts	20	10,843	-	10,863	2	11,852	-	11,854
Commodity contracts	218	1,462	-	1,680	295	1,161	-	1,456
Equity contracts	103	2,896	-	2,999	246	2,183	1	2,430
Credit default swaps	-	101	1	102	-	36	1	37
	352	23,245	1	23,598	557	23,070	2	23,629

Quantitative Information about Level 3 Fair Value Measurements

The table below presents the fair values of our significant Level 3 financial instruments, the valuation techniques used to determine their fair values and the value ranges of significant unobservable inputs used in the valuations. We have not applied any other reasonably possible alternative assumption to the significant Level 3 categories of private equity investments, as the net asset values are provided by the investment or fund managers.

As at October 31, 2019 (Canadian \$ in millions, except as noted)	Reporting line in fair value hierarchy table	Fair value of assets	Valuation techniques	Significant unobservable inputs	Range of input values (1)	
					Low	High
Private equity (2)	Corporate equity	1,984	Net asset value EV/EBITDA	Net asset value Multiple	na 5x	na 16x
Loans (3)	Business and government loans	1,736	Discounted cash flows	Discount margin	70 bps	115 bps
NHA MBS and U.S. agency MBS and CMO	NHA MBS and U.S. agency MBS and CMO	538	Discounted cash flows Market comparable	Prepayment rate Comparability adjustment (4)	2% (5.91)	30% 8.57

(1) The low and high input values represent the highest and lowest actual level of 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 specific underlying instruments within each 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.

(2) Included in private equity is \$829 million of Federal Reserve Bank and U.S. Federal Home Loan Bank shares that we carry at cost, which approximates fair value, and hold to meet regulatory requirements.

(3) The impact of assuming a 10 basis point increase or decrease in discount margin for business and government loans is \$3 million.

(4) Range of input values represents price per security adjustment.

na - not applicable

Significant Unobservable Inputs in Level 3 Instrument Valuations

Net Asset Value

Net asset value represents the estimated value of a security based on valuations received from the investment or fund manager. The valuation of certain private equity securities is based on the economic benefit we derive from our investment.

EV/EBITDA Multiple

The fair value of private equity and merchant banking investments is derived by calculating an enterprise value ("EV") using the EV/EBITDA multiple and then proceeding through a waterfall of the company's capital structure to determine the value of the assets or securities we hold. The EV/EBITDA multiple is determined using judgment in considering factors such as multiples for comparable listed companies, recent transactions and company-specific factors, as well as liquidity discounts that account for the lack of active trading in these assets and securities.

Discount Margin

Loan and corporate debt yield is the interest rate used to discount expected future cash flows in the valuation model. The discount margin is the difference between an instrument's yield and a benchmark instrument's yield. Benchmark instruments, such as government bonds, have high credit quality ratings and similar maturities. The discount margin therefore represents a market return that accounts for uncertainty in future cash flows. Generally, a higher or lower discount margin will result in a lower or higher fair value.

Discounted Cash Flow

Discounted cash flow models are used to fair value our NHA MBS and U.S. agency MBS and CMOs. The cash flow model includes assumptions related to conditional prepayment rates, constant default rates and percentage loss on default.

Market Comparable Pricing

Market comparable pricing is used to evaluate the fair value of NHA MBS and U.S. agency MBS and CMOs. This technique involves sourcing prices from third parties for similar instruments and applying adjustments to reflect recent transaction prices and instrument specific characteristics.

Significant Transfers

Our policy is to record transfers of assets and liabilities between fair value hierarchy levels at their fair values as at the end of each reporting period, consistent with the date of the determination of fair value. Transfers between the various fair value hierarchy levels reflect changes in the availability of quoted market prices or observable market inputs that result from changes in market conditions. The following is a discussion of the significant transfers between Level 1, Level 2 and Level 3 balances for the year ended October 31, 2019.

During the year ended October 31, 2019, we refined our judgment of whether quoted prices for fixed income securities were obtained from markets that were active or not in the determination of whether a security should be classified as Level 1 or Level 2, with the result that certain securities were transferred to Level 2 in the year. During the year ended October 31, 2019, \$5,831 million of trading securities, \$715 million of FVTPL securities, \$11,014 million of FVOCI securities and \$9,973 million of securities sold but not yet purchased (\$2,578 million of trading securities, \$714 million of FVTPL securities, \$2,266 million of FVOCI securities and \$3,971 million of securities sold but not yet purchased respectively, in 2018) were transferred from Level 1 to Level 2 due to our refined approach and reduced observability of the inputs used to value these securities. During the year ended October 31, 2019, \$7,985 million of trading securities, \$808 million of FVTPL securities, \$7,309 million of FVOCI securities and \$7,898 million of securities sold but not yet purchased (\$4,122 million of trading securities, \$742 million of FVTPL securities, \$4,044 million of FVOCI securities and \$4,210 million of securities sold but not yet purchased respectively, in 2018) were transferred from Level 2 to Level 1 due to increased availability of quoted prices in active markets.

During the year ended October 31, 2019, \$159 million (\$nil in 2018) of trading securities were transferred from Level 2 to Level 3 due to changes in the market observability of inputs used in pricing these securities, and \$87 million (\$nil in 2018) were transferred from Level 3 to Level 2 due to the availability of observable price inputs used to value these securities.

Changes in Level 3 Fair Value Measurements

The tables below present a reconciliation of all changes in Level 3 financial instruments during the years ended October 31, 2019 and 2018, including realized and unrealized gains (losses) included in earnings and other comprehensive income.

For the year ended October 31, 2019 (Canadian \$ in millions)	Change in fair value								Fair value as at October 31, 2019	Change in unrealized gains (losses) recorded in income for instruments still held (3)
	Balance October 31, 2018	Included in earnings	Included in other compre- hensive income (1)	Purchases	Sales (2)	Maturities/ Settlement	Transfers into Level 3	Transfers out of Level 3		
Trading Securities										
NHA MBS and U.S. agency MBS and CMO	255	(46)	1	654	(399)	-	159	(86)	538	(16)
Corporate debt	7	-	-	44	(43)	-	-	(1)	7	-
Total trading securities	262	(46)	1	698	(442)	-	159	(87)	545	(16)
FVTPL Securities										
Corporate debt	-	-	-	-	-	-	-	-	-	-
Corporate equity	1,825	21	(2)	421	(280)	(1)	-	-	1,984	58
Total FVTPL securities	1,825	21	(2)	421	(280)	(1)	-	-	1,984	58
FVOCI Securities										
Issued or guaranteed by:										
U.S. states, municipalities and agencies										
	1	-	-	-	-	-	-	-	1	na
Corporate debt	-	-	-	-	-	-	-	-	-	na
Corporate equity	62	-	2	17	-	-	-	-	81	na
Total FVOCI securities	63	-	2	17	-	-	-	-	82	na
Business and Government Loans	1,450	7	8	1,410	-	(1,139)	-	-	1,736	-
Fair Value Liabilities										
Securities sold but not yet purchased	-	-	-	(7)	7	-	-	-	-	-
Total fair value liabilities	-	-	-	(7)	7	-	-	-	-	-
Derivative Liabilities										
Equity contracts	1	-	-	-	-	-	-	(1)	-	-
Credit default swaps	1	-	-	-	-	-	1	(1)	1	-
Total derivative liabilities	2	-	-	-	-	-	1	(2)	1	-

(1) Foreign exchange translation on trading securities held by foreign subsidiaries is included in other comprehensive income, net foreign operations.

(2) Includes proceeds recovered on securities sold but not yet purchased.

(3) Changes in unrealized gains (losses) on FVTPL securities still held on October 31, 2019 are included in earnings for the year.

na - not applicable

For the year ended October 31, 2018 (Canadian \$ in millions)	Change in fair value							Fair value as at October 31, 2018	Change in unrealized gains (losses) recorded in income for instruments still held (2)	
	Balance November 1, 2017	Included in earnings	Included in other compre- hensive income (1)	Purchases	Sales	Maturities/ Settlement	Transfers into Level 3			Transfers out of Level 3
Trading Securities										
NHA MBS and U.S. agency MBS and CMO	-	(1)	4	306	(54)	-	-	-	255	(5)
Corporate debt	-	-	-	7	-	-	-	-	7	-
Total trading securities	-	(1)	4	313	(54)	-	-	-	262	(5)
FVTPL Securities										
Corporate debt	73	-	(4)	5	-	-	-	(74)	-	-
Corporate equity	1,701	12	31	307	(161)	(2)	-	(63)	1,825	5
Total FVTPL securities	1,774	12	27	312	(161)	(2)	-	(137)	1,825	5
FVOCI Securities										
Issued or guaranteed by:										
U.S. states, municipalities and agencies	1	-	-	-	-	-	-	-	1	na
Corporate debt	2	-	-	-	-	(2)	-	-	-	na
Corporate equity	-	-	-	62	-	-	-	-	62	na
Total FVOCI securities	3	-	-	62	-	(2)	-	-	63	na
Business and Government Loans	2,372	(2)	24	604	-	(1,548)	-	-	1,450	-
Derivative Liabilities										
Equity contracts	-	-	-	-	-	-	1	-	1	-
Credit default swaps	-	-	-	-	-	-	1	-	1	-
Total derivative liabilities	-	-	-	-	-	-	2	-	2	-

(1) Foreign exchange translation on trading securities held by foreign subsidiaries is included in other comprehensive income, net foreign operations.

(2) Changes in unrealized gains (losses) on trading securities, derivative assets and derivative liabilities still held on October 31, 2018 are included in earnings for the year.

na - not applicable

Trading-Related Revenue

Trading assets and liabilities, including derivatives, securities and financial instruments designated at fair value through profit or loss, are measured at fair value, with gains and losses recognized in trading revenues, non-interest revenue, in the Consolidated Statement of Income. Trading-related revenue includes net interest income and non-interest revenue and excludes underwriting fees and commissions on securities transactions, which are shown separately in the Consolidated Statement of Income. Net interest income arises from interest and dividends related to trading assets and liabilities and is reported net of interest expense associated with funding these assets and liabilities in the following table.

(Canadian \$ in millions)	2019	2018	2017
Interest rates	700	437	480
Foreign exchange	401	377	369
Equities	269	449	239
Commodities	145	63	84
Other	6	95	39
Total trading revenue	1,521	1,421	1,211
Reported as:			
Net interest income	1,223	716	1,127
Non-interest revenue - trading revenue	298	705	84
Total trading revenue	1,521	1,421	1,211

certain comparative figures have been reclassified to conform with the current year's presentation.

Note 18: Offsetting of Financial Assets and Financial Liabilities

Financial assets and financial liabilities are offset and the net amount is reported in our Consolidated Balance Sheet when there is a legally enforceable right to offset the recognized amounts and there is an intention to settle on a net basis, or realize the asset and settle the liability simultaneously. The following table presents the amounts that have been offset in our Consolidated Balance Sheet, including securities purchased under resale agreements, securities sold under repurchase agreements and derivative instruments, generally under a market settlement mechanism (e.g. an exchange or clearing house) where simultaneous net settlement can be achieved to eliminate credit and liquidity risk between counterparties. Also presented are amounts not offset in the Consolidated Balance Sheet related to transactions where a master netting agreement or similar arrangement is in place with a right to offset the amounts only in the event of default, insolvency or bankruptcy, or where the offset criteria are otherwise not met.

(Canadian \$ in millions)							2019
	Gross amounts	Amounts offset in the balance sheet	Net amounts presented in the balance sheet	Amounts not offset in the balance sheet			Net amount (3)
				Impact of master netting agreements	Securities received/pledged as collateral (1)(2)	Cash collateral	
Financial Assets							
Securities borrowed or purchased under resale agreements	104,949	945	104,004	9,919	93,062	82	941
Derivative instruments	22,423	279	22,144	13,538	1,740	2,750	4,116
	127,372	1,224	126,148	23,457	94,802	2,832	5,057
Financial Liabilities							
Derivative instruments	23,877	279	23,598	13,538	1,940	2,971	5,149
Securities lent or sold under repurchase agreements	87,601	945	86,656	9,919	76,501	4	232
	111,478	1,224	110,254	23,457	78,441	2,975	5,381

(Canadian \$ in millions)							2018
	Gross amounts	Amounts offset in the balance sheet	Net amounts presented in the balance sheet	Amounts not offset in the balance sheet			Net amount (3)
				Impact of master netting agreements	Securities received/pledged as collateral (1)(2)	Cash collateral	
Financial Assets							
Securities borrowed or purchased under resale agreements	86,635	1,584	85,051	13,516	70,479	-	1,056
Derivative instruments	25,721	299	25,422	15,575	505	3,576	5,766
	112,356	1,883	110,473	29,091	70,984	3,576	6,822
Financial Liabilities							
Derivative instruments	23,928	299	23,629	15,575	600	1,492	5,962
Securities lent or sold under repurchase agreements	68,268	1,584	66,684	13,516	52,910	-	258
	92,196	1,883	90,313	29,091	53,510	1,492	6,220

(1) Financial assets received/pledged as collateral are disclosed at fair value and are limited to the net balance sheet exposure (i.e. any over-collateralization is excluded from the table).

(2) Certain amounts of collateral are restricted from being sold or repledged except in the event of default or the occurrence of other predetermined events.

(3) Not intended to represent our actual exposure to credit risk.

Certain comparative figures have been reclassified to conform with the current year's presentation.

Note 19: Capital Management

Our objective is to maintain a strong capital position in a cost-effective structure that: is appropriate given our target regulatory capital ratios and internal assessment of required economic capital; underpins our operating groups' business strategies; supports depositor, investor and regulator confidence, while building long-term shareholder value; and is consistent with our target credit ratings.

Our approach includes establishing limits, targets and performance measures that are used to manage balance sheet positions, risk levels and capital requirements, as well as issuing and redeeming capital instruments to achieve a cost-effective capital structure.

Regulatory capital requirements and risk-weighted assets for the consolidated entity are determined in accordance with OSFI's Capital Adequacy Requirements Guideline.

Common Equity Tier 1 ("CET1") capital is the most permanent form of capital. It is comprised of common shareholders' equity less deductions for goodwill, intangible assets and certain other items. Tier 1 capital is primarily comprised of CET1, preferred shares and other equity instruments, less regulatory deductions.

Tier 2 capital is primarily comprised of subordinated debentures and may include certain loan loss allowances, less regulatory deductions. Total capital includes Tier 1 and Tier 2 capital. Details of the components of our capital position are presented in Notes 11, 12, 15 and 16.

CET1 Capital Ratio, Tier 1 Capital Ratio, Total Capital Ratio and Leverage Ratio are the primary regulatory capital measures.

- The CET1 Capital Ratio is defined as CET1 capital divided by CET1 capital risk-weighted assets.
- The Tier 1 Capital Ratio is defined as Tier 1 capital divided by Tier 1 capital risk-weighted assets.
- The Total Capital Ratio is defined as Total capital divided by Total capital risk-weighted assets.
- The Leverage Ratio is defined as Tier 1 capital divided by the sum of on-balance sheet items and specified off-balance sheet items, net of specified adjustments (leverage exposures).

As at October 31, 2019, we met OSFI's required target capital ratios, which include a 2.5% Capital Conservation Buffer, a 1.0% Common Equity Tier 1 Surcharge for domestic systemically important banks, a Countercyclical Buffer and a 2.0% Domestic Stability Buffer.

Regulatory Capital Measures, Risk-Weighted Assets and Leverage Exposures

(Canadian \$ in millions, except as noted)	2019	2018
Common Equity Tier 1 Capital	36,071	32,721
Tier 1 Capital	41,201	37,220
Total Capital	48,340	44,116
Common Equity Tier 1 Capital Risk-Weighted Assets	317,029	289,237
Tier 1 Capital Risk-Weighted Assets	317,029	289,420
Total Capital Risk-Weighted Assets	317,029	289,604
Leverage Exposures	956,493	876,106
Common Equity Tier 1 Capital Ratio	11.4%	11.3%
Tier 1 Capital Ratio	13.0%	12.9%
Total Capital Ratio	15.2%	15.2%
Leverage Ratio	4.3%	4.2%

Note 20: Employee Compensation – Share-Based Compensation

Stock Option Plan

We maintain a Stock Option Plan for designated officers and employees. Options are granted at an exercise price equal to the closing price of our common shares on the day before the grant date. Stock options granted on or after December 2013 vest in equal tranches of 50% on the third and fourth anniversaries of their grant date. Options granted prior to December 2013 vest in tranches over a four-year period starting from their grant date. Each tranche is treated as a separate award with a different vesting period. In general, options expire 10 years from their grant date.

We determine the fair value of stock options on their grant date and record this amount as compensation expense over the period that the stock options vest, with a corresponding increase to contributed surplus. When these stock options are exercised, we issue shares and record the amount of proceeds, together with the amount recorded in contributed surplus, in share capital. The estimated grant date fair value of stock options granted to employees who are eligible to retire is expensed at the date of grant.

The following table summarizes information about our Stock Option Plan:

(Canadian \$, except as noted)	2019		2018		2017	
	Number of stock options	Weighted-average exercise price (1)	Number of stock options	Weighted-average exercise price (1)	Number of stock options	Weighted-average exercise price (1)
Outstanding at beginning of year	6,095,201	72.19	7,525,296	72.05	9,805,299	77.41
Granted	931,047	89.90	705,398	100.63	723,431	96.90
Exercised	902,651	60.21	1,513,307	58.40	2,233,801	57.80
Forfeited/cancelled	4,756	98.96	152,417	86.85	13,243	66.89
Expired	10,534	103.79	469,769	153.40	756,390	195.02
Outstanding at end of year	6,108,307	76.59	6,095,201	72.19	7,525,296	72.05
Exercisable at end of year	3,507,803	64.57	3,782,481	61.39	4,584,375	67.42
Available for grant	2,487,645		3,405,239		3,811,157	

(1) The weighted-average exercise prices reflect the conversion of foreign currency denominated options at the exchange rate as at October 31, 2019, October 31, 2018 and October 31, 2017, respectively. For foreign currency denominated options exercised or expired during the year, the weighted-average exercise prices are translated using the exchange rates as at the settlement date and expiry date, respectively.

Employee compensation expense related to this plan for the years ended October 31, 2019, 2018 and 2017 was \$9 million, \$7 million and \$8 million before tax, respectively (\$8 million, \$7 million and \$7 million after tax, respectively).

The intrinsic value of a stock option grant is the difference between the current market price of our common shares and the strike price of the option. The aggregate intrinsic value of stock options outstanding at October 31, 2019, 2018 and 2017 was \$130 million, \$162 million and \$232 million, respectively. The aggregate intrinsic value of stock options exercisable at October 31, 2019, 2018 and 2017 was \$116 million, \$140 million and \$174 million, respectively.

Options outstanding and exercisable at October 31, 2019 by range of exercise price were as follows:

(Canadian \$, except as noted)

Range of exercise prices	Options outstanding			Options exercisable		
	Number of stock options	Weighted-average remaining contractual life (years)	Weighted-average exercise price (2)	Number of stock options	Weighted-average remaining contractual life (years)	Weighted-average exercise price (2)
\$50.01 to \$60.00	1,229,196	1.7	56.42	1,229,196	1.7	56.42
\$60.01 to \$70.00	1,535,630	3.7	64.71	1,535,630	3.7	64.71
\$70.01 to \$80.00	1,082,146	5.7	77.59	741,659	5.5	77.75
\$80.01 to \$90.00	928,566	9.1	89.89	753	0.5	81.77
\$90.01 and over (1)	1,332,769	7.6	98.81	565	0.5	99.02

(1) Certain options were issued as part of the acquisition of M&I.

(2) The weighted-average exercise prices reflect the conversion of foreign currency denominated options at the exchange rate as at October 31, 2019.

The following table summarizes additional information about our Stock Option Plan:

(Canadian \$ in millions, except as noted)

	2019	2018	2017
Unrecognized compensation cost for non-vested stock option awards	6	5	5
Weighted-average period over which this cost will be recognized (in years)	2.6	2.6	2.7
Total intrinsic value of stock options exercised	36	67	90
Cash proceeds from stock options exercised	54	88	129
Weighted-average share price for stock options exercised (in dollars)	99.84	102.55	98.05

The fair value of options granted was estimated using a binomial option pricing model. The weighted-average fair value of options granted during the years ended October 31, 2019, 2018 and 2017 was \$10.23, \$11.30 and \$11.62, respectively. To determine the fair value of the stock option tranches on the grant date, the following ranges of values were used for each option pricing assumption:

	2019	2018	2017
Expected dividend yield	5.7%	4.1%	4.3%
Expected share price volatility	20.0% – 20.1%	17.0% – 17.3%	18.4% – 18.8%
Risk-free rate of return	2.5%	2.1%	1.7% – 1.8%
Expected period until exercise (in years)	6.5 – 7.0	6.5 – 7.0	6.5 – 7.0

Changes to the input assumptions can result in different fair value estimates.

Expected dividend yield is based on market expectations of future dividends on our common shares. Expected share price volatility is determined based on the market consensus implied volatility for traded options on our common shares. The risk-free rate is based on the yields of a Canadian swap curve with maturities similar to the expected period until exercise of the options. The weighted-average exercise price on the grant date for the years ended October 31, 2019, 2018 and 2017 was \$89.90, \$100.63 and \$96.90, respectively.

Other Share-Based Compensation

Share Purchase Plans

We offer various employee share purchase plans. The largest of these plans provides employees with the option of directing a portion of their gross salary toward the purchase of our common shares. We match 50% of employee contributions up to 6% of their individual gross salary to a maximum of \$100,000. Our contributions during the first two years vest after two years of participation in the plan, with subsequent contributions vesting immediately. The shares held in the employee share purchase plan are purchased on the open market and are considered outstanding for purposes of computing earnings per share. The dividends earned on our common shares held by the plan are used to purchase additional common shares on the open market.

We account for our contributions as employee compensation expense when they are contributed to the plan.

Employee compensation expense related to these plans for the years ended October 31, 2019, 2018 and 2017 was \$54 million, \$51 million and \$53 million, respectively. There were 18.0 million, 17.8 million and 18.3 million common shares held in these plans for the years ended October 31, 2019, 2018 and 2017, respectively.

Compensation Trusts

We sponsor various share ownership arrangements, certain of which are administered through trusts into which our matching contributions are paid. We are not required to consolidate our compensation trusts. The assets held by the trusts are not included in our consolidated financial statements.

Total assets held under our share ownership arrangements amounted to \$1,752 million as at October 31, 2019 (\$1,752 million in 2018).

Mid-Term Incentive Plans

We offer mid-term incentive plans for executives and certain senior employees. Payment amounts are adjusted to reflect reinvested dividends and changes in the market value of our common shares. Depending on the plan, the recipient receives either a single cash payment at the end of the three-year period of the plan, or cash payments over the three years of the plan. As the awards are cash settled, they are recorded as liabilities. Amounts payable under such awards are recorded as compensation expense over the vesting period. Amounts related to units granted to employees who are eligible to retire are expensed at the time of grant. Subsequent changes in the fair value of the liability are recorded in compensation expense in the period in which they arise.

Mid-term incentive plan units granted during the years ended October 31, 2019, 2018 and 2017 totalled 6.3 million, 5.9 million and 5.9 million, respectively.

Prior to 2015, we entered into agreements with third parties to assume our liabilities related to a portion of units granted for a fixed up-front payment. For units subject to such arrangements, we no longer have any obligation for future cash payments and as a result no liability is recorded

related to these awards. All cash payments made under such arrangements are deferred in the Consolidated Balance Sheet as other assets and are recognized on a straight-line basis over the vesting period. Subsequent changes in the market value of our common shares do not affect the amount of compensation expense related to these awards. During the year ended October 31, 2017, all remaining deferred compensation related to these arrangements was recognized.

Employee compensation expense related to plans where we entered into agreements with third parties for the years ended October 31, 2019, 2018 and 2017 was \$nil, \$nil and \$(7) million before tax, respectively (\$nil, \$nil and \$(5) million after tax, respectively).

Mid-term incentive plan units for which we did not enter into agreements with third parties for the years ended October 31, 2019, 2018 and 2017 totalled 6.3 million, 5.9 million and 5.9 million units, respectively. The grant date fair value of these awards as at October 31, 2019, 2018 and 2017 was \$616 million, \$581 million and \$515 million, respectively, for which we recorded employee compensation expense of \$610 million, \$595 million and \$703 million before tax, respectively (\$448 million, \$437 million and \$516 million after tax, respectively). We hedge the impact of the change in market value of our common shares by entering into total return swaps. We also enter into foreign currency swaps to manage the foreign exchange translation from our U.S. businesses. Gains on total return swaps and foreign currency swaps recognized for the years ended October 31, 2019, 2018 and 2017 were \$20 million, \$51 million and \$183 million, respectively, resulting in net employee compensation expense of \$590 million, \$544 million and \$520 million, respectively.

A total of 17.2 million, 17.1 million and 17.0 million mid-term incentive plan units were outstanding as at October 31, 2019, 2018 and 2017, respectively, and the intrinsic value of those awards which had vested was \$1,251 million, \$1,269 million and \$1,253 million, respectively. Cash payments made in relation to these liabilities were \$642 million, \$598 million and \$343 million, respectively.

Deferred Incentive Plans

We offer deferred incentive plans for members of our Board of Directors, executives and key employees in BMO Capital Markets and Wealth Management. Under these plans, fees, annual incentive payments and/or commissions can be deferred as share units of our common shares. These share units are either fully vested on the grant date or vest at the end of three years. The value of these share units is adjusted to reflect reinvested dividends and changes in the market value of our common shares.

Deferred incentive plan payments are paid in cash upon the participant's departure from the bank.

Employee compensation expense for these plans is recorded in the year the fees, incentive payments and/or commissions are earned. Changes in the amount of the incentive plan payments as a result of dividends and share price movements are recorded as increases or decreases in employee compensation expense in the period of the change.

Deferred incentive plan units granted during the years ended October 31, 2019, 2018 and 2017 totalled 0.3 million, 0.3 million and 0.3 million, respectively, and the grant date fair value of these units was \$32 million, \$33 million and \$32 million, respectively.

Liabilities related to these plans are recorded in other liabilities in our Consolidated Balance Sheet and totalled \$478 million and \$485 million as at October 31, 2019 and 2018, respectively. Payments made under these plans for the years ended October 31, 2019, 2018 and 2017 were \$59 million, \$60 million and \$32 million, respectively.

Employee compensation expense related to these plans for the years ended October 31, 2019, 2018 and 2017 was \$17 million, \$27 million and \$91 million before tax, respectively (\$12 million, \$20 million and \$67 million after tax, respectively). We have entered into derivative instruments to hedge our exposure related to these plans. Changes in the fair value of these derivatives are recorded as employee compensation expense in the period in which they arise. Gains on these derivatives recognized for the years ended October 31, 2019, 2018 and 2017 were \$4 million, \$8 million and \$78 million before tax, respectively. These gains resulted in net employee compensation expense for the years ended October 31, 2019, 2018 and 2017 of \$13 million, \$19 million and \$13 million before tax, respectively (\$10 million, \$14 million and \$10 million after tax, respectively).

A total of 4.8 million, 4.9 million and 5.0 million deferred incentive plan units were outstanding as at October 31, 2019, 2018 and 2017, respectively.

Note 21: Employee Compensation – Pension and Other Employee Future Benefits

Pension and Other Employee Future Benefit Plans

We sponsor a number of arrangements globally that provide pension and other employee future benefits to our retired and current employees. The largest of these arrangements, by defined benefit obligation, are the primary defined benefit pension plans for employees in Canada and the United States and the primary other employee future benefit plan for employees in Canada.

Pension arrangements include defined benefit pension plans, as well as supplementary arrangements that provide pension benefits in excess of statutory limits. Generally, under these plans we provide retirement benefits based on an employee's years of service and average annual earnings over a period of time prior to retirement. Our pension and other employee future benefit expenses, recorded in employee compensation expense, mainly comprise the current service cost plus or minus the interest on net defined benefit assets or liabilities. In addition, we provide defined contribution pension plans to employees in some of our subsidiaries. The costs of these plans, recorded in employee compensation expense, are equal to our contributions to the plans.

During the year ended October 31, 2018, we announced changes to our other employee future benefit plan for Canadian employees that will become mandatory for new retirees beginning January 1, 2021. Plan changes include an increase in the service requirement for eligibility and flexible benefits with employer premium caps. In 2018, we recorded a \$277 million benefit from the remeasurement of the benefit liability in non-interest expense, employee compensation, in our Consolidated Statement of Income.

We also provide other employee future benefits, including health and dental care benefits and life insurance, for eligible current and retired employees.

Short-term employee benefits, such as salaries, paid absences, bonuses and other benefits, are accounted for on an accrual basis over the period in which the employees provide the related services.

Investment Policy

The defined benefit pension plans are administered under a defined governance structure, with oversight resting with the Board of Directors.

The plans are managed under a framework that considers both assets and liabilities in the development of an investment policy and in managing risk. Over the past several years, we have implemented a liability-driven investment strategy for the primary Canadian plan to enhance risk-adjusted returns while reducing the plan's surplus volatility. This strategy has reduced the impact of the plan on our regulatory capital.

The plans invest in asset classes that include equities, fixed income and alternative strategies, under established investment guidelines. Plan assets are diversified across asset classes and by geographic exposure. They are managed by asset management firms that are responsible for the selection of investment securities. Derivative instruments are permitted under policy guidelines and are generally used to hedge foreign currency exposures, manage interest rate exposures or replicate the return of an asset.

Asset Allocations

The asset allocation ranges and weighted-average actual asset allocations of our primary pension plans, based on fair market values at October 31, are as follows:

	Pension benefit plans		
	Target range 2019	Actual 2019	Actual 2018
Equities	20% – 50%	32%	37%
Fixed income investments	25% – 55%	51%	46%
Alternative strategies	15% – 45%	17%	17%

Our pension and other employee future benefit plan assets are measured at fair value on a recurring basis.

Risk Management

The defined benefit pension plans are exposed to various risks, including market risk (interest rate, equity and foreign currency risks), credit risk, operational risk, surplus risk and longevity risk. We follow a number of approaches to monitor and actively manage these risks, including:

- monitoring surplus-at-risk, which measures a plan's risk in an asset-liability framework;
- stress testing and scenario analyses to evaluate the volatility of the plans' financial positions and any potential impact on the bank;
- hedging of currency exposures and interest rate risk within policy limits;
- controls related to asset mix allocations, geographic allocations, portfolio duration, credit quality of debt securities, sector guidelines, issuer/counterparty limits and others; and
- ongoing monitoring of exposures, performance and risk levels.

Pension and Other Employee Future Benefit Liabilities

Our actuaries perform valuations of our defined benefit obligations for pension and other employee future benefits as at October 31 of each year using the projected unit credit method based on management's assumptions about discount rates, rates of compensation increase, retirement age, mortality and health care cost trend rates.

The discount rates for the primary Canadian and U.S. pension and other employee future benefit plans were selected based on the yields of high-quality AA rated corporate bonds with terms matching the plans' cash flows.

The fair value of plan assets is deducted from the defined benefit obligation to determine the net defined benefit asset or liability. For defined benefit pension plans that are in a net defined benefit asset position, the recognized asset is limited to the present value of economic benefits available in the form of future refunds from the plan or reductions in future contributions to the plan (the "asset ceiling"). Changes in the asset ceiling are recognized in other comprehensive income. Components of the change in our net defined benefit assets or liabilities and our pension and other employee future benefit expense are as follows:

Current service cost represents benefits earned in the current year. The cost is determined with reference to the current workforce and the amount of benefits to which employees will be entitled upon retirement, based on the provisions of our benefit plans.

Interest on net defined benefit asset or liability represents the increase in the net defined benefit asset or liability that results from the passage of time and is determined by applying the discount rate to the net defined benefit asset or liability.

Actuarial gains and losses may arise in two ways. First, each year our actuaries recalculate the defined benefit obligations and compare them to those estimated as at the previous year end. Any differences that result from changes in demographic and economic assumptions or from plan member experience being different from management's expectations at the previous year end are considered actuarial gains or losses. Second, actuarial gains and losses arise when there are differences between the discount rate and actual returns on plan assets. Actuarial gains and losses are recognized immediately in other comprehensive income as they occur and are not subsequently reclassified to income in future periods.

Plan amendments are changes in our defined benefit obligations that result from changes to provisions of the plans. The effects of plan amendments are recognized immediately in income when a plan is amended.

Settlements occur when defined benefit obligations for plan participants are settled, usually through lump sum cash payments, and as a result we no longer have any obligation to provide such participants with benefit payments in the future.

Funding of Pension and Other Employee Future Benefit Plans

We fund our defined benefit pension plans in Canada and the United States in accordance with statutory requirements, and the assets in these plans are used to pay benefits to retirees and other employees. Some groups of employees are also eligible to make voluntary contributions in order to receive enhanced benefits. Our supplementary pension plan in Canada is funded, while the supplementary pension plan in the U.S. is unfunded.

Our other employee future benefit plans in Canada and the United States are either funded or unfunded. Benefit payments related to these plans are paid either through the respective plan or directly by us.

We measure the fair value of plan assets for our plans in Canada and the United States as at October 31. In addition to actuarial valuations for accounting purposes, we are required to prepare valuations for determining our minimum funding requirements for our pension arrangements in

accordance with the relevant statutory framework (our “funding valuation”). An annual funding valuation is performed for our plans in Canada and the United States. The most recent funding valuation for our primary Canadian pension plan was performed as at October 31, 2019 and the most recent funding valuation for our primary U.S. pension plan was performed as at January 1, 2019.

A summary of plan information for the past three years is as follows:

(Canadian \$ in millions)	Pension benefit plans			Other employee future benefit plans		
	2019	2018	2017	2019	2018	2017
Defined benefit obligation	9,866	8,311	8,846	1,254	1,113	1,460
Fair value of plan assets	9,723	8,719	8,990	175	153	157
Surplus (deficit) and net defined benefit asset (liability)	(143)	408	144	(1,079)	(960)	(1,303)
Surplus (deficit) is comprised of:						
Funded or partially funded plans	36	573	339	46	37	28
Unfunded plans	(179)	(165)	(195)	(1,125)	(997)	(1,331)
Surplus (deficit) and net defined benefit asset (liability)	(143)	408	144	(1,079)	(960)	(1,303)

Pension and Other Employee Future Benefit Expenses

Pension and other employee future benefit expenses are determined as follows:

(Canadian \$ in millions)	Pension benefit plans			Other employee future benefit plans		
	2019	2018	2017	2019	2018	2017
Annual benefits expense						
Current service cost	193	210	254	9	26	32
Net interest (income) expense on net defined benefit (asset) liability	(20)	(10)	7	37	45	47
Past service cost (income)	(5)	7	-	-	(277)	-
Administrative expenses	5	5	5	-	-	-
Remeasurement of other long-term benefits	-	-	-	6	(10)	(6)
Benefits expense	173	212	266	52	(216)	73
Canada and Quebec pension plan expense	82	76	75	-	-	-
Defined contribution expense	170	153	123	-	-	-
Total annual pension and other employee future benefit expenses recognized in the Consolidated Statement of Income	425	441	464	52	(216)	73

Weighted-Average Assumptions

	Pension benefit plans			Other employee future benefit plans		
	2019	2018	2017	2019	2018	2017
Defined Benefit Expenses						
Discount rate at beginning of year (3)(4)	4.0%	3.5%	3.4%	4.1%	3.6%	3.6%
Rate of compensation increase	2.4%	2.4%	2.8%	2.0%	2.0%	2.4%
Assumed overall health care cost trend rate	na	na	na	4.9% (1)	4.9% (1)	5.2% (2)
Defined Benefit Obligation						
Discount rate at end of year	3.0%	4.0%	3.5%	3.0%	4.1%	3.6%
Rate of compensation increase	2.1%	2.4%	2.4%	2.0%	2.0%	2.0%
Assumed overall health care cost trend rate	na	na	na	4.9% (1)	4.9% (1)	5.2% (2)

(1) Trending to 4.1% in 2040 and remaining at that level thereafter.

(2) Trending to 4.5% in 2031 and remaining at that level thereafter.

(3) The pension benefit current service cost was calculated using a separate discount rate of 4.10%, 3.70% and 3.68% for 2019, 2018 and 2017, respectively.

(4) The other employee future benefit plans current service cost was calculated using a separate discount rate of 4.20%, 3.76% and 3.78% for 2019, 2018 and 2017, respectively.

na – not applicable

Assumptions regarding future mortality are based on published statistics and mortality tables calibrated to plan experience, when applicable. The current life expectancies underlying the amounts of the defined benefit obligations for our primary plans are as follows:

(Years)	Canada		United States	
	2019	2018	2019	2018
Life expectancy for those currently age 65				
Males	23.7	23.7	21.7	21.9
Females	24.1	24.0	23.0	23.4
Life expectancy at age 65 for those currently age 45				
Males	24.7	24.6	22.8	23.1
Females	25.0	25.0	24.2	24.5

Changes in the estimated financial positions of our defined benefit pension plans and other employee future benefit plans are as follows:

(Canadian \$ in millions, except as noted)	Pension benefit plans		Other employee future benefit plans	
	2019	2018	2019	2018
Defined benefit obligation				
Defined benefit obligation at beginning of year	8,311	8,846	1,113	1,460
U.S. plan merger (1)	46	-	-	-
Current service cost	193	210	9	26
Past service cost (income)	(5)	7	-	(277)
Interest cost	324	299	44	51
Benefits paid	(456)	(492)	(53)	(43)
Employee contributions	17	15	5	5
Actuarial (gains) losses due to:				
Changes in demographic assumptions	(9)	(50)	(22)	(31)
Changes in financial assumptions	1,345	(562)	161	(77)
Plan member experience	92	16	(3)	(4)
Foreign exchange and other	8	22	-	3
Defined benefit obligation at end of year	9,866	8,311	1,254	1,113
Wholly or partially funded defined benefit obligation	9,687	8,146	129	116
Unfunded defined benefit obligation	179	165	1,125	997
Total defined benefit obligation	9,866	8,311	1,254	1,113
Fair value of plan assets				
Fair value of plan assets at beginning of year	8,719	8,990	153	157
U.S. plan merger (1)	43	-	-	-
Interest income	344	309	7	6
Return on plan assets (excluding interest income)	795	(323)	23	(10)
Employer contributions	256	213	40	35
Employee contributions	17	15	5	5
Benefits paid	(456)	(492)	(53)	(43)
Administrative expenses	(5)	(5)	-	-
Foreign exchange and other	10	12	-	3
Fair value of plan assets at end of year	9,723	8,719	175	153
Surplus (deficit) and net defined benefit asset (liability) at end of year	(143)	408	(1,079)	(960)
Recorded in:				
Other assets	186	664	46	-
Other liabilities	(329)	(256)	(1,125)	(960)
Surplus (deficit) and net defined benefit asset (liability) at end of year	(143)	408	(1,079)	(960)
Actuarial gains (losses) recognized in other comprehensive income				
Net actuarial gains (losses) on plan assets	795	(323)	23	(10)
Actuarial gains (losses) on defined benefit obligation due to:				
Changes in demographic assumptions	9	50	21	30
Changes in financial assumptions	(1,345)	562	(153)	72
Plan member experience	(92)	(16)	3	1
Foreign exchange and other	(9)	6	-	-
Actuarial gains (losses) recognized in other comprehensive income for the year	(642)	279	(106)	93

(1) In 2019, the benefit obligation and assets related to employees formerly included in a multi-employer plan, which was accounted for as a defined contribution plan, merged with the U.S. defined benefit pension plan. The impact of the merger was recognized as a remeasurement of the U.S. defined benefit pension plan.

Our pension and other employee future benefit plan assets are measured at fair value on a recurring basis. The fair values of plan assets held by our primary plans as at October 31 are as follows:

(Canadian \$ in millions)	2019			2018		
	Quoted	Unquoted	Total	Quoted	Unquoted	Total
Cash and money market funds	156	6	162	114	-	114
Securities issued or guaranteed by:						
Canadian federal government	1	57	58	108	41	149
Canadian provincial and municipal governments	334	368	702	219	309	528
U.S. federal government	345	-	345	297	-	297
U.S. states, municipalities and agencies	-	-	-	-	12	12
Pooled funds	1,450	3,204	4,654	1,591	2,715	4,306
Derivative instruments	-	8	8	1	(14)	(13)
Corporate debt	-	1,354	1,354	6	1,055	1,061
Corporate equity	1,219	-	1,219	1,105	-	1,105
	3,505	4,997	8,502	3,441	4,118	7,559

No plan assets are directly invested in the bank's or related parties' securities as at October 31, 2019 and 2018. As at October 31, 2019, our primary Canadian plan indirectly held, through pooled funds, approximately \$10 million (\$15 million in 2018) of our common shares and fixed income securities. The plans do not hold any property we occupy or other assets we use.

The plans paid \$3 million in the year ended October 31, 2019 (\$4 million in 2018) to the bank and certain of our subsidiaries for investment management, record-keeping, custodial and administrative services rendered.

Sensitivity of Assumptions

Key weighted-average assumptions used in measuring the defined benefit obligations for our primary plans are outlined in the following table. The sensitivity analysis provided in the table should be used with caution, as it is hypothetical and the impact of changes in each key assumption may not be linear. The sensitivities to changes in each key variable have been calculated independently of the impact of changes in other key variables. Actual experience may result in simultaneous changes in a number of key assumptions, which would amplify or reduce certain sensitivities.

(Canadian \$ in millions, except as noted)	Defined benefit obligation	
	Pension benefit plans	Other employee future benefit plans
Discount rate (%)	3.0	3.0
Impact of: 1% increase (\$)	(1,041)	(122)
1% decrease (\$)	1,324	153
Rate of compensation increase (%)	2.1	2.0
Impact of: 0.25% increase (\$)	51	– (1)
0.25% decrease (\$)	(49)	– (1)
Mortality		
Impact of: 1 year shorter life expectancy (\$)	(185)	(28)
1 year longer life expectancy (\$)	182	29
Assumed overall health care cost trend rate (%)	na	4.9 (2)
Impact of: 1% increase (\$)	na	49
1% decrease (\$)	na	(51)

(1) The change in this assumption is immaterial.

(2) Trending to 4.1% in 2040 and remaining at that level thereafter.

na – not applicable

Maturity Profile

The duration of the defined benefit obligation for our primary plans is as follows:

(Years)	2019	2018
Canadian pension plans	15.2	14.0
U.S. pension plans	7.9	7.2
Canadian other employee future benefit plans	14.5	14.3

Cash Flows

Cash payments we made during the year in connection with our employee future benefit plans are as follows:

(Canadian \$ in millions)	Pension benefit plans			Other employee future benefit plans		
	2019	2018	2017	2019	2018	2017
Contributions to defined benefit plans	203	154	187	–	–	–
Contributions to defined contribution plans	170	153	123	–	–	–
Benefits paid directly to pensioners	53	59	32	40	35	40
	426	366	342	40	35	40

Our best estimate of the contributions and benefits paid directly to pensioners we expect to make for the year ending October 31, 2020 is approximately \$277 million to our defined benefit pension plans and \$43 million to our other employee future benefit plans. Benefit payments for fiscal 2020 are estimated to be \$536 million.

Note 22: Income Taxes

We report our provision for income taxes in our Consolidated Statement of Income based upon transactions recorded in our consolidated financial statements regardless of when they are recognized for income tax purposes, with the exception of repatriation of retained earnings from our subsidiaries, as noted below.

In addition, we record an income tax expense or benefit in other comprehensive income or directly in equity when the taxes relate to amounts recorded in other comprehensive income or equity. For example, income tax expense (recovery) on hedging gains (losses) related to our net investment in foreign operations is recorded in our Consolidated Statement of Comprehensive Income as part of net gains (losses) on translation of net foreign operations.

Current tax is the amount of income tax recoverable (payable) in respect of the taxable loss (profit) for a period. Deferred tax is recognized on temporary differences between the carrying amounts of assets and liabilities for accounting and tax purposes. Deferred income tax assets and liabilities are measured at the tax rates expected to apply when temporary differences reverse. Changes in deferred income tax assets and liabilities related to a change in tax rates are recorded in income in the period the tax rate is substantively enacted, except to the extent that the tax arises from a transaction or event which is recognized either in other comprehensive income or directly in equity. Current and deferred taxes are offset only when they are levied by the same tax authority, on the same entity or group of entities, and when there is a legal right to offset.

Included in deferred income tax assets is \$26 million (\$42 million in 2018) related to Canadian tax loss carryforwards that will expire in 2037, \$289 million (\$962 million in 2018) related to both U.S. tax loss carryforwards and tax credits that will expire in various amounts in U.S. taxation years from 2020 through 2039 and \$19 million (\$17 million in 2018) related to United Kingdom (U.K.) tax loss carryforwards that are available for use indefinitely against relevant profits generated in the U.K. On the evidence available, including management projections of income, we believe that it is probable there will be sufficient taxable income generated by our business operations to support these deferred tax assets. The amount of tax on temporary differences, unused tax losses and unused tax credits for which no deferred tax asset is recognized in our Consolidated Balance Sheet as at October 31, 2019 is \$127 million (\$132 million in 2018), of which \$3 million (\$8 million in 2018) is scheduled to expire within five years. Deferred tax assets have not been recognized in respect of these items because it is not probable that these assets will be realized.

Income that we earn through our foreign subsidiaries is generally taxed in the foreign country in which they operate. Income that we earn through our foreign branches is also generally taxed in the foreign country in which they operate. Canada also taxes the income we earn through foreign branches and a credit is allowed for certain foreign taxes paid on such income. Repatriation of earnings from certain foreign subsidiaries would require us to pay tax on certain of these earnings. As repatriation of such earnings is not planned in the foreseeable future, we have not recorded a related deferred income tax liability. The taxable temporary differences associated with the repatriation of earnings from investments in certain subsidiaries, branches, associates and interests in joint ventures for which deferred tax liabilities have not been recognized totalled \$15 billion as at October 31, 2019 (\$13 billion in 2018).

Provision for Income Taxes

(Canadian \$ in millions)	2019	2018	2017
Consolidated Statement of Income			
Current			
Provision for income taxes for the current period	1,198	1,340	1,159
Adjustments in respect of current tax for prior periods	(14)	20	18
Deferred			
Origination and reversal of temporary differences	327	268	171
Effect of changes in tax rates	3	425	(2)
Previously unrecognized tax loss, tax credit or temporary difference for a prior period	-	(92)	(54)
	1,514	1,961	1,292
Other Comprehensive Income and Equity			
Income tax expense (recovery) related to:			
Unrealized gains (losses) on FVOCI debt securities (1)	140	(69)	21
Reclassification to earnings of (gains) on FVOCI debt securities (1)	(26)	(23)	(36)
Gains (losses) on derivatives designated as cash flow hedges	521	(432)	(322)
Reclassification to earnings of losses on derivatives designated as cash flow hedges	51	121	21
Hedging of unrealized (gains) losses on translation of net foreign operations	(4)	(56)	8
Gains (losses) on remeasurement of pension and other employee future benefit plans	(196)	111	157
Gains (Losses) on remeasurement of own credit risk on financial liabilities designated at fair value	27	(6)	(53)
Unrealized gains on FVOCI equity securities	1	-	na
Share-based compensation	-	10	(12)
	514	(344)	(216)
Total provision for income taxes	2,028	1,617	1,076

(1) Fiscal 2017 represents available-for-sale securities (Note 3).

na - not applicable due to IFRS 9 adoption.

Certain comparative figures have been reclassified to conform with the current year's presentation.

Components of Total Provision for Income Taxes

(Canadian \$ in millions)	2019	2018	2017
Canada: Current income taxes			
Federal	791	501	470
Provincial	465	299	272
	1,256	800	742
Canada: Deferred income taxes			
Federal	(113)	(44)	(2)
Provincial	(66)	(27)	-
	(179)	(71)	(2)
Total Canadian	1,077	729	740
Foreign: Current income taxes	308	233	186
Deferred income taxes	643	655	150
Total foreign	951	888	336
Total provision for income taxes	2,028	1,617	1,076

Certain comparative figures have been reclassified to conform with the current year's presentation.

Set out below is a reconciliation of our statutory tax rates and income taxes that would be payable at these rates to the effective income tax rates and provision for income taxes that we have recorded in our Consolidated Statement of Income:

(Canadian \$ in millions, except as noted)	2019		2018		2017	
Combined Canadian federal and provincial income taxes at the statutory tax rate	1,934	26.6%	1,972	26.6%	1,764	26.6%
Increase (decrease) resulting from:						
Tax-exempt income from securities	(220)	(3.0)	(226)	(3.0)	(409)	(6.2)
Foreign operations subject to different tax rates	(158)	(2.2)	(110)	(1.5)	22	0.3
Change in tax rate for deferred income taxes	3	-	425	5.7	(2)	-
Previously unrecognized tax loss, tax credit or temporary difference for a prior period	-	-	(92)	(1.2)	(54)	(0.8)
Income attributable to investments in associates and joint ventures	(37)	(0.5)	(39)	(0.5)	(103)	(1.5)
Adjustments in respect of current tax for prior periods	(14)	(0.2)	20	0.3	18	0.2
Other	6	0.1	11	0.1	56	0.9
Provision for income taxes in the Consolidated Statement of Income and effective tax rate	1,514	20.8%	1,961	26.5%	1,292	19.5%

Components of Deferred Income Tax Balances

(Canadian \$ in millions)	Net asset, October 31, 2018	Benefit (expense) to income statement	Benefit (expense) to equity	Translation and other	Net asset, October 31, 2019
Deferred Income Tax Asset (Liability) (1)					
Allowance for credit losses	484	23	-	4	511
Employee future benefits	282	12	31	-	325
Deferred compensation benefits	494	(12)	-	1	483
Other comprehensive income	195	-	(331)	(7)	(143)
Tax loss carryforwards	606	(462)	-	1	145
Tax credits	415	(228)	-	2	189
Premises and equipment	(515)	234	-	(1)	(282)
Pension benefits	(121)	(18)	166	-	27
Goodwill and intangible assets	(201)	(14)	-	(2)	(217)
Securities	38	12	-	-	50
Other	288	123	-	9	420
Total	1,965	(330)	(134)	7	1,508

(Canadian \$ in millions)	Net asset, November 1, 2017 (2)	Benefit (expense) to income statement	Benefit (expense) to equity	Translation and other	Net asset, October 31, 2018
Deferred Income Tax Asset (Liability) (1)					
Allowance for credit losses	684	(150)	-	(50)	484
Employee future benefits	416	(111)	(23)	-	282
Deferred compensation benefits	545	(50)	-	(1)	494
Other comprehensive income	50	-	138	7	195
Tax loss carryforwards	1,233	(628)	-	1	606
Tax credits	454	(39)	-	-	415
Premises and equipment	(664)	148	-	1	(515)
Pension benefits	(52)	19	(88)	-	(121)
Goodwill and intangible assets	(261)	60	-	-	(201)
Securities	21	17	-	-	38
Other	180	133	(10)	(15)	288
Total	2,606	(601)	17	(57)	1,965

(1) Deferred tax assets of \$1,568 million and \$2,039 million and deferred tax liabilities of \$60 million and \$74 million as at October 31, 2019 and 2018, respectively, are presented on the balance sheet net by legal jurisdiction.

(2) Includes IFRS 9 adoption (refer to Note 28).

Certain comparative figures have been reclassified to conform with the current year's presentation.

In fiscal 2019, we were reassessed by the Canada Revenue Agency ("CRA") for additional income taxes and interest in an amount of approximately \$250 million in respect of certain 2014 Canadian corporate dividends. In prior fiscal years, we were reassessed for additional income taxes and interest of approximately \$361 million, for certain 2011 to 2013 Canadian corporate dividends. In its reassessments, the CRA denied dividend deductions on the basis that the dividends were received as part of a "dividend rental arrangement." The tax rules raised by the CRA in the reassessments were prospectively addressed in the 2015 and 2018 Canadian federal budgets. In the future, we expect to be reassessed for significant income tax for similar activities in 2015 and subsequent years. We remain of the view that our tax filing positions were appropriate and intend to challenge any reassessment.

On December 22, 2017, the U.S. government enacted new tax legislation that became effective on January 1, 2018. Under the new legislation, our U.S. net deferred tax asset was revalued by \$483 million because of the lower income tax rate. The \$483 million revaluation is comprised of a \$425 million income tax expense recorded in our Consolidated Statement of Income, and a \$58 million income tax charge recorded in other comprehensive income and equity for the year ended October 31, 2018.

Note 23: Earnings Per Share

Basic earnings per share is calculated by dividing net income attributable to equity holders of the bank, after deducting dividends on preferred shares and distributions on other equity instruments, by the daily average number of fully paid common shares outstanding throughout the year.

Diluted earnings per share is calculated in the same manner, with further adjustments made to reflect the dilutive impact of instruments convertible into our common shares.

The following table presents our basic and diluted earnings per share:

Basic Earnings Per Common Share (Canadian \$ in millions, except as noted)	2019	2018	2017
Net income attributable to equity holders of the bank	5,758	5,453	5,337
Dividends on preferred shares and distributions on other equity instruments	(211)	(184)	(184)
Net income available to common shareholders	5,547	5,269	5,153
Weighted-average number of common shares outstanding (in thousands)	638,881	642,930	649,650
Basic earnings per common share (Canadian \$)	8.68	8.19	7.93
Diluted Earnings Per Common Share			
Net income available to common shareholders adjusted for impact of dilutive instruments	5,547	5,269	5,153
Weighted-average number of common shares outstanding (in thousands)	638,881	642,930	649,650
Effect of dilutive instruments			
Stock options potentially exercisable (1)	5,326	5,876	6,859
Common shares potentially repurchased	(3,847)	(3,893)	(4,548)
Weighted-average number of diluted common shares outstanding (in thousands)	640,360	644,913	651,961
Diluted earnings per common share (Canadian \$)	8.66	8.17	7.90

(1) In computing diluted earnings per share, we excluded average stock options outstanding of 1,177,152, 1,101,938 and 1,330,564 with weighted-average exercise prices of \$101.83, \$127.45 and \$182.70 for the years ended October 31, 2019, 2018 and 2017, respectively, as the average share price for the period did not exceed the exercise price.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Note 24: Commitments, Guarantees, Pledged Assets, Provisions and Contingent Liabilities

In the normal course of business, we enter into a variety of contracts under which we may be required to make payments to reimburse a counterparty for a loss if a third party does not perform according to the terms of a contract or does not make payments when due under the terms of a debt instrument, and contracts under which we provide indirect guarantees of the indebtedness of another party, all of which are considered guarantees.

Guarantees that qualify as derivatives are accounted for in accordance with the policy for derivative instruments (see Note 8). For guarantees that do not qualify as derivatives, the liability is initially recorded at fair value, which is generally the fee received. Subsequently, guarantees are recorded at the higher of the initial fair value, less amortization to recognize any fee income earned over the period, and our best estimate of the amount required to settle the obligation. Any change in the liability is reported in our Consolidated Statement of Income.

We enter into a variety of commitments, including off-balance sheet credit instruments, such as backstop liquidity facilities, securities lending, letters of credit, credit default swaps and commitments to extend credit, as a method of meeting the financial needs of our customers. These commitments include contracts where we may be required to make payments to a counterparty, based on changes in the value of an asset, liability or equity security that the counterparty holds, due to changes in an underlying interest rate, foreign exchange rate or other variable. The contractual amount of our commitments represents our maximum undiscounted potential exposure, before possible recoveries under recourse and collateral provisions. Collateral requirements for these instruments are consistent with our collateral requirements for loans.

A large majority of these commitments expire without being drawn upon. As a result, the total contractual amounts may not be representative of the funding likely to be required for these commitments.

We strive to limit credit risk by dealing only with counterparties that we believe are creditworthy, and we manage our credit risk for these instruments using the same credit risk process that is applied to loans and other credit assets.

The maximum amount payable related to our various commitments is as follows:

(Canadian \$ in millions)	2019	2018
Financial Guarantees		
Standby letters of credit	21,395	18,458
Credit default swaps (1)	2,068	443
Other Credit Instruments		
Backstop liquidity facilities	5,550	5,627
Securities lending	4,102	4,939
Documentary and commercial letters of credit	1,272	1,263
Commitments to extend credit (2)	158,533	137,995
Other commitments	5,181	8,935
Total	198,101	177,660

(1) The fair value of the related derivatives included in our Consolidated Balance Sheet was \$43 million as at October 31, 2019 (\$8 million in 2018).

(2) Commitments to extend credit exclude personal lines of credit and credit cards that are unconditionally cancellable at our discretion.

Financial Guarantees

Standby letters of credit represent our obligation to make payments to third parties on behalf of customers if they are unable to make the required payments or meet other contractual requirements. The majority have a term of one year or less. Collateral requirements for standby letters of credit and guarantees are consistent with our collateral requirements for loans. Standby letters of credit and guarantees include our guarantee of a subsidiary's debt directly provided to a third party.

Written credit default swaps require us to compensate a counterparty following the occurrence of a credit event in relation to a specified reference obligation, such as a bond or a loan. The terms of these contracts range from less than one year to 10 years. Refer to Note 8 for details.

Other Credit Instruments

Backstop liquidity facilities are provided to asset-backed commercial paper ("ABCP") programs administered by either us or third parties as an alternative source of financing when ABCP markets cannot be accessed. The terms of the backstop liquidity facilities do not require us to advance money to these programs in the event of insolvency of the borrower and generally do not require us to advance money against non-performing or defaulted assets. The average term of these liquidity facilities is approximately 2 years.

We lend eligible customers' securities to third-party borrowers who have been evaluated for credit risk using the same credit risk process that is applied to loans and other credit assets. In connection with these activities, we may provide indemnification to clients against losses resulting from the failure of the borrower to return loaned securities when due. All borrowings are fully collateralized with cash or marketable securities. As securities are loaned, we require borrowers to maintain collateral that is equal to or in excess of 100% of the fair value of the securities borrowed. The collateral is revalued on a daily basis.

Documentary and commercial letters of credit represent our agreement to honour drafts presented by a third party upon completion of specific activities.

Commitments to extend credit represent our commitment to our customers to grant them credit in the form of loans or other financings for specific amounts and maturities, subject to their meeting certain conditions.

Other commitments include commitments to fund external private equity funds and investments in equity and debt securities at market value at the time the commitments are drawn. In addition, 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.

Indemnification Agreements

In the normal course of operations, we enter into various agreements that provide general indemnifications. These indemnifications typically occur in connection with sales of assets, securities offerings, service contracts, membership agreements, clearing arrangements, derivative contracts and leasing transactions. Based on historical experience, we expect the risk of loss to be remote.

Exchange and Clearinghouse Guarantees

We are a member of several securities and futures exchanges and central counterparties. Membership in certain of these organizations may require us to pay a pro rata share of the losses incurred by the organization in the event of default of another member. It is difficult to estimate our maximum exposure under these membership agreements, since this would require an assessment of future claims that may be made against us that have not yet occurred. Based on historical experience, we expect the risk of loss to be remote.

Pledged Assets

In the normal course of business, we pledge assets as security for various liabilities that we incur.

The following tables summarize our pledged assets and collateral, and the activities to which they relate:

(Canadian \$ in millions)	2019	2018
Bank Assets		
Cash and securities (1)		
Issued or guaranteed by the Government of Canada	5,633	7,784
Issued or guaranteed by a Canadian province, municipality or school corporation	5,465	7,143
Other	75,076	60,812
Mortgages, securities borrowed or purchased under resale agreements and other	125,035	115,256
	211,209	190,995

(Canadian \$ in millions)	2019	2018
Assets pledged in relation to:		
Central counterparties, payment systems and depositories	2,098	2,403
Bank of Canada	467	525
Foreign governments and central banks	3	3
Obligations related to securities sold under repurchase agreements	73,696	54,606
Securities borrowing and lending	48,892	50,388
Derivatives transactions	9,614	6,120
Securitization	30,120	28,710
Covered bonds	27,208	26,721
Other	19,111	21,519
Total pledged assets and collateral (1)	211,209	190,995

(1) Excludes cash pledged with central banks disclosed as restricted cash in Note 2.

Collateral

When entering into trading activities, such as purchases under resale agreements, securities borrowing and lending activities or financing for certain derivative transactions, we require our counterparties to provide us with collateral that will protect us from losses in the event of their default. Collateral transactions (received or pledged) are typically conducted under terms that are usual and customary in standard trading activities. If there is no default, the securities or their equivalents must be returned to, or returned by, the counterparty at the end of the contract.

The fair value of counterparty collateral that we are permitted to sell or repledge (in the absence of default by the owner of the collateral) was \$163,929 million as at October 31, 2019 (\$123,782 million as at October 31, 2018). The fair value of collateral that we have sold or repledged was \$101,665 million as at October 31, 2019 (\$82,392 million as at October 31, 2018).

Lease Commitments

We have entered into a number of non-cancellable leases for premises and equipment. Our computer and software leases are typically fixed for one term and our premises leases have various renewal options and rights. Our total contractual rental commitments as at October 31, 2019 were \$3,800 million. The commitments for each of the next five years and thereafter are \$389 million for 2020, \$361 million for 2021, \$337 million for 2022, \$305 million for 2023, \$289 million for 2024 and \$2,119 million thereafter. Included in these amounts are commitments related to 1,165 leased branch locations as at October 31, 2019.

Provisions and Contingent Liabilities

Provisions are recognized when we have a legal or constructive obligation as a result of past events, such as contractual commitments, legal or other obligations for which we can reliably estimate the obligation, and it is probable we will be required to settle the obligation. We recognize as a provision our best estimate of the amount required to settle the obligations as of the balance sheet date, taking into account the risks and uncertainties surrounding the obligations. Provisions are recorded in other liabilities on the Consolidated Balance Sheet. Contingent liabilities are potential obligations arising from past events, the existence of which will only be confirmed by the occurrence or non-occurrence of one or more future events not wholly within our control, and are not included in the table below.

Restructuring Charges

Provisions for restructuring charges as at October 31, 2019 are \$603 million (\$176 million as at October 31, 2018), which includes \$484 million related to severance and a small amount of real estate-related costs, to continue to improve efficiency, including accelerating delivery against key bank-wide initiatives focused on digitization, organizational redesign and simplification of the way we do our business. This represents our best estimate of the amount that will ultimately be paid out.

Legal Proceedings

The bank and its subsidiaries are party to legal proceedings, including regulatory investigations, in the ordinary course of business. While there is inherent difficulty in predicting the outcome of these proceedings, management does not expect the outcome of any of these proceedings, individually or in the aggregate, to have a material adverse effect on the consolidated financial position or the results of operations of the bank.

Changes in the provision balance during the year were as follows:

(Canadian \$ in millions)	2019	2018
Balance at beginning of year	284	170
Additional provisions/increase in provisions	666	375
Provisions utilized	(251)	(250)
Amounts reversed	(32)	(11)
Foreign exchange and other	13	-
Balance at end of year (1)	680	284

(1) Balance includes severance obligations, restructuring charges and legal provisions.

Note 25: Operating and Geographic Segmentation

Operating Groups

We conduct our business through three operating groups, each of which has a distinct mandate. We determine our operating groups based on our management structure and therefore these groups, and the results attributed to them, may not be comparable with those of other financial services companies. We evaluate the performance of our groups using reported and adjusted measures, such as net income, revenue growth, return on equity, and non-interest expense-to-revenue (productivity) ratio, as well as operating leverage.

Effective with the adoption of IFRS 9, we allocate the provision for credit losses on performing loans and the related allowance to operating groups. In 2017 and prior years, the collective provision and allowance were held in Corporate Services.

Personal and Commercial Banking

Personal and Commercial Banking ("P&C") is comprised of two operating segments: Canadian Personal and Commercial Banking and U.S. Personal and Commercial Banking.

Canadian Personal and Commercial Banking

Canadian Personal and Commercial Banking ("Canadian P&C") provides a full range of financial products and services to eight million customers. Personal Banking provides financial solutions for everyday banking, financing, investing, credit card and creditor insurance needs. Commercial Banking provides our small business and commercial banking customers with a broad suite of integrated commercial and capital markets products, as well as financial advisory services.

U.S. Personal and Commercial Banking

U.S. Personal and Commercial Banking (“U.S. P&C”) offers a broad range of products and services. Our retail and small and mid-sized business banking customers are served through our branches, contact centres, online and mobile banking platforms, and automated banking machines across eight states. Our commercial banking customers are offered in-depth specific industry knowledge, as well as strategic capital markets solutions.

BMO Wealth Management

BMO’s group of wealth management businesses serves a full range of client segments, from mainstream to ultra high net worth and institutional, with a broad offering of wealth management products and services, including insurance products. Wealth Management (“BMO WM”) is a global business with an active presence in markets across Canada, the United States, EMEA and Asia.

BMO Capital Markets

BMO Capital Markets (“BMO CM”) is a North American-based financial services provider offering a complete range of products and services to corporate, institutional and government clients. Through our Investment and Corporate Banking and Global Markets lines of business, we operate in 33 locations around the world, including 19 offices in North America.

Corporate Services

Corporate Services consists of Corporate Units and Technology and Operations (“T&O”). Corporate Units provide enterprise-wide expertise, governance and support in a variety of areas, including strategic planning, risk management, finance, legal and regulatory compliance, human resources, communications, marketing, real estate, procurement, data and analytics, and innovation. T&O manages, maintains and provides governance of information technology, cyber security and operations services for the bank.

The costs of these Corporate Units and T&O services are largely transferred to the three operating groups (P&C, BMO WM and BMO CM), with any remaining amounts retained in Corporate Services results. As such, Corporate Services results largely reflect the impact of residual treasury-related activities, the elimination of taxable equivalent adjustments, residual unallocated expenses and certain acquisition integration costs and restructuring costs.

Basis of Presentation

The results of these operating groups are based on our internal financial reporting systems. The accounting policies used in these segments are generally consistent with those followed in the preparation of our consolidated financial statements, as disclosed in Note 1 and throughout the consolidated financial statements. Income taxes presented below may not be reflective of taxes paid in each jurisdiction in which we operate. Income taxes are generally applied to each segment based on a statutory tax rate and may be adjusted for items and activities specific to each segment. A notable accounting measurement difference is the taxable equivalent basis adjustment, as described below.

Periodically, certain business lines and units within the business lines are transferred between client and corporate support groups to more closely align our organizational structure with our strategic priorities. In addition, revenue and expense allocations are updated to more accurately align with current experience. Results for prior periods are restated to conform with the current year’s presentation.

Taxable Equivalent Basis

We analyze revenue on a taxable equivalent basis (“teb”) at the operating group level. Revenue and the provision for income taxes are increased on tax-exempt securities to an equivalent before-tax basis to facilitate comparisons of income between taxable and tax-exempt sources. The offset to the groups’ teb adjustments is reflected in Corporate Services revenue and provision for income taxes. The teb adjustment for the year ended October 31, 2019 was \$296 million (\$313 million in 2018 and \$567 million in 2017).

Inter-Group Allocations

Various estimates and allocation methodologies are used in the preparation of the operating groups’ financial information. Overhead expenses are allocated to operating groups using allocation formulas applied on a consistent basis. Operating group net interest income reflects internal funding charges and credits on the groups’ assets, liabilities and capital, at market rates, taking into account relevant terms and currency considerations. The offset of the net impact of these charges and credits is reflected in Corporate Services. These inter-group allocations are also applied to the geographic segmentation.

Our results and average assets, grouped by operating segment, are as follows:

(Canadian \$ in millions)	Canadian P&C	U.S. P&C	Wealth Management	BMO CM	Corporate Services (1)	Total
2019						
Net interest income (2)	5,878	4,218	935	2,394	(537)	12,888
Non-interest revenue	2,128	1,162	6,727	2,340	238	12,595
Total Revenue	8,006	5,380	7,662	4,734	(299)	25,483
Provision for (recovery of) credit losses on impaired loans	544	160	2	52	(7)	751
Provision for (recovery of) credit losses on performing loans	63	37	(2)	28	(5)	121
Total provision for (recovery of) credit losses	607	197	-	80	(12)	872
Insurance claims, commissions and changes in policy benefit liabilities	-	-	2,709	-	-	2,709
Depreciation and amortization	338	456	262	149	-	1,205
Non-interest expense	3,516	2,683	3,260	3,112	854	13,425
Income (loss) before taxes and non-controlling interest in subsidiaries	3,545	2,044	1,431	1,393	(1,141)	7,272
Provision for (recovery of) income taxes	919	433	371	307	(516)	1,514
Reported net income (loss)	2,626	1,611	1,060	1,086	(625)	5,758
Average Assets	237,995	126,584	40,951	342,347	85,375	833,252
2018						
Net interest income (2)	5,541	3,843	826	1,784	(556)	11,438
Non-interest revenue	2,069	1,096	5,475	2,579	248	11,467
Total Revenue	7,610	4,939	6,301	4,363	(308)	22,905
Provision for (recovery of) credit losses on impaired loans	466	258	6	(17)	(13)	700
Provision for (recovery of) credit losses on performing loans	3	(38)	-	(1)	(2)	(38)
Total provision for (recovery of) credit losses	469	220	6	(18)	(15)	662
Insurance claims, commissions and changes in policy benefit liabilities	-	-	1,352	-	-	1,352
Depreciation and amortization	317	454	231	125	-	1,127
Non-interest expense	3,393	2,514	3,284	2,734	425	12,350
Income (loss) before taxes and non-controlling interest in subsidiaries	3,431	1,751	1,428	1,522	(718)	7,414
Provision for (recovery of) income taxes	882	357	356	366	-	1,961
Reported net income (loss)	2,549	1,394	1,072	1,156	(718)	5,453
Average Assets	224,554	110,351	35,913	307,087	76,390	754,295
2017						
Net interest income (2)	5,261	3,551	722	2,501	(760)	11,275
Non-interest revenue	2,079	1,005	5,496	2,075	177	10,832
Total Revenue	7,340	4,556	6,218	4,576	(583)	22,107
Provision for (recovery of) credit losses (3)	483	289	8	44	(78)	746
Insurance claims, commissions and changes in policy benefit liabilities	-	-	1,538	-	-	1,538
Depreciation and amortization	308	433	242	120	-	1,103
Non-interest expense	3,226	2,458	3,113	2,666	626	12,089
Income (loss) before taxes and non-controlling interest in subsidiaries	3,323	1,376	1,317	1,746	(1,131)	6,631
Provision for (recovery of) income taxes	823	358	350	471	(710)	1,292
Reported net income (loss)	2,500	1,018	967	1,275	(421)	5,339
Non-controlling interest in subsidiaries	-	-	2	-	-	2
Net Income (loss) attributable to equity holders of the bank	2,500	1,018	965	1,275	(421)	5,337
Average Assets	217,685	104,209	32,562	302,518	65,652	722,626

(1) Corporate Services includes Technology and Operations.

(2) Operating groups report on a taxable equivalent basis – see Basis of Presentation section.

(3) 2017 has not been restated to reflect the adoption of IFRS 9.

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Geographic Information

We operate primarily in Canada and the United States, but we also have operations in the U.K., Europe, the Caribbean and Asia, which are grouped in other countries in the table below. We allocate our results by geographic region based on the location of the unit responsible for managing the related assets, liabilities, revenues and expenses.

Our results and average assets, grouped by geographic region, are as follows:

(Canadian \$ in millions)	Canada	United States	Other countries	Total
2019				
Total Revenue	15,134	8,282	2,067	25,483
Income before taxes	4,324	2,367	581	7,272
Reported net income	3,391	1,903	464	5,758
Average Assets	469,032	316,983	47,237	833,252
(Canadian \$ in millions)	Canada	United States	Other countries	Total
2018				
Total Revenue	13,632	7,273	2,000	22,905
Income before taxes	4,840	1,871	703	7,414
Reported net income	3,797	1,100	556	5,453
Average Assets	441,376	277,764	35,155	754,295
(Canadian \$ in millions)	Canada	United States	Other countries	Total
2017				
Total Revenue	13,365	7,015	1,727	22,107
Income before taxes and non-controlling interest in subsidiaries	4,589	1,580	462	6,631
Reported net income	3,816	1,200	323	5,339
Average Assets	430,570	264,473	27,583	722,626

Certain comparative figures have been reclassified to conform with the current year's presentation and for changes in accounting policy (Note 1).

Note 26: Significant Subsidiaries

As at October 31, 2019, the bank, either directly or indirectly through its subsidiaries, controls the following significant operating subsidiaries.

Significant subsidiaries (1)(2)	Head or principal office	Book value of shares owned by the bank (Canadian \$ in millions)
Bank of Montreal Capital Markets (Holdings) Limited and subsidiaries, including:	London, England	364
BMO Capital Markets Limited	London, England	
Pyrford International Limited	London, England	
Bank of Montreal (China) Co. Ltd.	Beijing, China	449
Bank of Montreal Europe plc (3)	Dublin, Ireland	1,042
Bank of Montreal Holding Inc. and subsidiaries, including:	Toronto, Canada	31,175
Bank of Montreal Mortgage Corporation	Calgary, Canada	
BMO Mortgage Corp.	Vancouver, Canada	
BMO Investments Limited	Hamilton, Bermuda	
BMO Reinsurance Limited	St. Michaels, Barbados	
BMO Nesbitt Burns Holdings Corporation	Toronto, Canada	
BMO Nesbitt Burns Inc.	Toronto, Canada	
BMO Investments Inc.	Toronto, Canada	
BMO InvestorLine Inc.	Toronto, Canada	
BMO Financial Corp. and subsidiaries, including:	Chicago, United States	23,396
BMO Asset Management Corp. and subsidiaries	Chicago, United States	
BMO Capital Markets Corp.	New York, United States	
BMO Family Office, LLC (4)	Palo Alto, United States	
BMO Harris Bank National Association and subsidiaries, including:	Chicago, United States	
BMO Harris Investment Company LLC	Las Vegas, United States	
BMO Harris Financial Advisors, Inc.	Chicago, United States	
BMO Harris Financing, Inc. and subsidiaries	Chicago, United States	
BMO Global Asset Management (Europe) Limited and subsidiaries, including:	London, England	677
BMO Asset Management (Holdings) plc and subsidiaries	London, England	
BMO Life Insurance Company and subsidiaries, including:	Toronto, Canada	1,285
BMO Life Holdings (Canada), ULC	Halifax, Canada	
BMO Life Assurance Company	Toronto, Canada	
BMO Trust Company	Toronto, Canada	774
BMO Trustee Asia Limited	Hong Kong, China	2
LGM (Bermuda) Limited and subsidiaries, including:	Hamilton, Bermuda	154
BMO Global Asset Management (Asia) Limited	Hong Kong, China	
LGM Investments Limited	London, England	

(1) Each subsidiary is incorporated or organized under the laws of the state or country in which the principal office is situated, except for BMO Financial Corp., BMO Asset Management Corp., BMO Capital Markets Corp., BMO Harris Financial Advisors, Inc., BMO Harris Financing, Inc., and BMO Family Office, LLC, which are incorporated under the laws of the state of Delaware, United States. BMO Asset Management (Holdings) plc is incorporated under the laws of Scotland.

(2) Unless otherwise noted, the bank, either directly or indirectly through its subsidiaries, owns 100% of the outstanding voting shares of each subsidiary.

(3) Effective September 2, 2019, Bank of Montreal Ireland Public Limited Company changed its name to Bank of Montreal Europe Public Limited Company.

(4) Effective January 1, 2019, CTC MyCFO, LLC changed its name to BMO Family Office, LLC.

Significant Restrictions

Our ability to transfer funds between our subsidiaries may be restricted by statutory, contractual, capital and regulatory requirements. Restrictions include:

- Assets pledged as security for various liabilities we incur. Refer to Note 24 for details.
- Assets of our consolidated structured entities that are held for the benefit of the note holders. Refer to Note 7 for details.
- Assets held by our insurance subsidiaries. Refer to Note 12 for details.
- Regulatory and statutory requirements that reflect capital and liquidity requirements.
- Funds required to be held with central banks. Refer to Note 2 for details.

Note 27: Related Party Transactions

Related parties include subsidiaries, associates, joint ventures, employee future benefit plans and key management personnel and their close family members. Close family members include spouses, common-law partners and dependent minors. Transactions with our subsidiaries are eliminated on consolidation, and are not disclosed as related party transactions.

Key Management Personnel Compensation

Key management personnel is defined as those persons having authority and responsibility for planning, directing and/or controlling the activities of an entity, being the members of our Board of Directors ("directors") and certain senior executives.

The following table presents the compensation of our key management personnel:

(Canadian \$ in millions)	2019	2018	2017
Base salary and incentives	22	21	23
Post-employment benefits	2	2	1
Share-based payments (1)	43	31	38
Total key management personnel compensation	67	54	62

(1) Amounts included in share-based payments are the fair values of awards granted in the year.

We offer senior executives market interest rates on credit card balances, a fee-based subsidy on annual credit card fees, and a select suite of customer loan and mortgage products at rates normally accorded to preferred customers. At October 31, 2019, loans to key management personnel totalled \$21 million (\$16 million in 2018). We have no provision for credit losses related to these amounts as at October 31, 2019 and 2018.

Directors receive a specified amount of their annual retainer in deferred stock units. Until a director's shareholdings (including deferred stock units) are eight times greater than their annual retainer, they are required to take 100% of their annual retainer and other fees in the form of either our common shares or deferred stock units. They may elect to receive the remainder of such retainer fees and other remuneration in cash, common shares or deferred stock units.

Directors of our wholly owned subsidiary, BMO Financial Corp., are required to take a specified minimum amount of their annual retainer and other fees in the form of deferred stock units.

Joint Ventures and Associates

We provide banking services to our joint ventures and associates on the same terms offered to our customers for these services.

The following table presents the carrying amount 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:

(Canadian \$ in millions)	Joint ventures		Associates	
	2019	2018	2019	2018
Carrying amount	343	231	501	471
Share of net income	99	107	52	60

We do not have any joint ventures or associates that are individually material to our consolidated financial statements.

The following table presents transactions with our joint ventures and associates:

(Canadian \$ in millions)	2019	2018
Loans	169	195
Deposits	106	114
Fees paid for services received	69	71
Guarantees and commitments	76	65

Note 28: Transition to IFRS 9

The following table shows the pre-transition IAS 39 and corresponding IFRS 9 classification and measurement categories, and reconciles the IAS 39 and IFRS 9 carrying amounts for loans, securities and other financial assets as at November 1, 2017 as a result of adopting IFRS 9. There were no changes to the measurement basis of other financial asset categories or any financial liabilities.

(Canadian \$ in millions)	IAS 39 measurement category	IFRS 9 measurement category	IAS 39 carrying amount	Reclassification	Remeasurement	IFRS 9 carrying amount
Financial Assets						
Securities						
	Trading	Trading	99,069	(8,534)	-	90,535
		FVTPL	-	8,534	-	8,534
	Available-for-sale	na	54,075	(54,075)	-	-
		FVOCI	-	51,909	-	51,909
		FVTPL	-	2,081	-	2,081
		Amortized cost	-	85	-	85
	Held-to-maturity	Amortized cost	9,094	-	(2)	9,092
	Other	Other	960	(333)	-	627
		FVTPL	-	333	-	333
Total Securities			163,198	-	(2)	163,196
Loans						
Residential mortgages	Amortized cost	Amortized cost	115,258	-	-	115,258
Consumer instalment and other	Amortized cost	Amortized cost	61,944	-	-	61,944
Credit cards	Amortized cost	Amortized cost	8,071	-	-	8,071
Business and government	Amortized cost	Amortized cost	175,067	(2,372)	-	172,695
		FVTPL	-	2,372	-	2,372
Total Loans			360,340	-	-	360,340
Allowance for credit losses			(1,833)	-	154	(1,679)
			358,507	-	154	358,661
Remaining financial assets (1)			127,706	-	(6)	127,700
Financial Liabilities						
Allowance for credit losses on off-balance sheet exposures			163	-	76	239
Total pre-tax impact of IFRS 9 adoption			na	-	70	na
Total after-tax Accumulated Other Comprehensive Income			3,066	(55)	-	3,011
Total after-tax Retained Earnings (2)(3)			23,709	55	44	23,808
Total after-tax Equity			44,354	-	44	44,398

(1) Represents cash and cash equivalents, interest bearing deposits with banks, securities borrowed or purchased under resale agreements and other assets. Remeasurement represents the impact of the impairment provisions of IFRS 9 on these remaining financial assets.

(2) Reclassification amount represents the after-tax impact (\$105 million pre-tax) that resulted from the reclassification of equity securities from available-for-sale under IAS 39 to fair value through profit or loss under IFRS 9.

(3) Remeasurement represents the after-tax impact (\$70 million pre-tax) of the adoption of the impairment provisions of IFRS 9.

na - not applicable due to IFRS 9 adoption.

The securities balances by measurement category following the adoption of IFRS 9 as at November 1, 2017 were:

(Canadian \$ in millions)	November 1, 2017
Trading	90,535
FVTPL	10,948
FVOCI	51,909
Amortized cost	9,177
Other	627
Total	163,196

The primary impact as a result of adopting the classification and measurement provisions of IFRS 9 relates to securities held by the bank.

On transition, our existing held-to-maturity securities continued to qualify for amortized cost treatment, as they are held with the intent to collect contractual cash flows and those cash flows represent solely payments of principal and interest.

Our available-for-sale portfolio was reclassified based on the result of the business model and contractual cash flow tests. All available-for-sale securities that represented equity instruments were reclassified as fair value through profit or loss. Available-for-sale securities that represented investments in debt instruments were generally classified as fair value through other comprehensive income. Certain available-for-sale debt securities were classified as fair value through profit or loss, as their contractual cash flows did not represent solely payments of principal and interest. Certain available-for-sale debt securities were classified as amortized cost, as they are held with the intent to collect contractual cash flows and those cash flows represent solely payments of principal and interest. On transition, investments held in our merchant banking business are classified as fair value through profit or loss and no longer require designation under the fair value option.

Our lending portfolios continue to be recorded at amortized cost, with the exception of certain business and government loans with contractual cash flows that did not represent solely payments of principal and interest, and were classified as fair value through profit or loss.

The following table illustrates the impact of transition to IFRS 9 on the allowance for credit losses as of November 1, 2017.

(Canadian \$ in millions)	IAS 39 collective allowance	IAS 39 specific allowance	IAS 39 allowance	Remeasurement	IFRS 9 allowance	IFRS 9 Stage 1	IFRS 9 Stage 2	IFRS 9 Stage 3
Loans								
Residential mortgages	69	24	93	(20)	73	16	33	24
Consumer instalment and other	343	136	479	71	550	70	344	136
Credit cards	243	-	243	41	284	63	221	-
Business and government	785	233	1,018	(246)	772	205	334	233
Total allowance for credit losses	1,440	393	1,833	(154)	1,679	354	932	393
Allowance for credit losses on remaining financial assets (1)	-	-	-	8	8	7	1	-
Allowance for credit losses on off-balance sheet exposures	136	27	163	76	239	89	123	27
Total	1,576	420	1,996	(70)	1,926	450	1,056	420

(1) Represents cash and cash equivalents, interest bearing deposits with banks, securities, securities borrowed or purchased under resale agreements and other assets.

Accounting Policies for Financial Instruments under IAS 39, *Financial Instruments: Recognition and Measurement*

The following accounting policies apply to comparative information for 2017 in our consolidated financial statements as we did not restate prior periods on adoption of IFRS 9.

Classification and Measurement of Securities

Securities are divided into four types: trading securities designated at FVTPL, available-for-sale securities, held-to-maturity securities and other securities.

Trading securities are securities that we purchase for resale over a short period of time. We classify trading securities and securities designated under the fair value option at fair value through profit or loss.

We record the transaction costs, gains and losses realized on disposal and unrealized gains and losses due to changes in fair value in our Consolidated Statement of Income in trading revenues. Securities designated at FVTPL are financial instruments that are accounted for at fair value, with changes in fair value recorded in income provided they meet certain criteria.

Available-for-sale securities consist of debt and equity securities that may be sold in response to or in anticipation of changes in interest rates and resulting prepayment risk, changes in credit risk, changes in foreign currency risk, changes in funding sources or terms, or in order to meet liquidity needs.

Available-for-sale securities are initially recorded at fair value plus transaction costs. They are subsequently measured at fair value, with unrealized gains and losses recorded in unrealized gains (losses) on available-for-sale securities in our Consolidated Statement of Comprehensive Income until the security is sold. Gains and losses on disposal and impairment losses (recoveries) are recorded in our Consolidated Statement of Income in non-interest revenue, securities gains, other than trading. Interest income earned and dividends received on available-for-sale securities are recorded in our Consolidated Statement of Income in interest, dividend and fee income, securities.

Held-to-maturity securities are debt securities that we have the intention and ability to hold to maturity and that do not meet the definition of a loan. These securities are initially recorded at fair value plus transaction costs and subsequently measured at amortized cost using the effective interest method. Impairment losses are recorded in our Consolidated Statement of Income in securities gains (losses), other than trading. Interest income earned and amortization of premiums or discounts on these debt securities are recorded in our Consolidated Statement of Income in interest, dividend and fee income, securities.

Other securities are investments in companies where we exert significant influence over operating, investing and financing decisions (generally companies in which we own between 20% and 50% of the voting shares). We account for these other securities using the equity method of accounting. Other securities also include certain securities held by our merchant banking business.

Impairment of Securities

We review held-to-maturity, available-for-sale and other securities at each quarter-end reporting period to identify and evaluate investments that show indications of possible impairment.

For held-to-maturity, available-for-sale and other securities, impairment losses are recognized if there is objective evidence of impairment as a result of an event that reduces the estimated future cash flows from the security and the impact can be reliably estimated.

We do not record impairment write-downs on debt securities when impairment is due to changes in market interest rates if future contractual cash flows associated with the debt security are still expected to be recovered.

The impairment loss on available-for-sale securities is the difference between the security's amortized cost and its current fair value, less any previously recognized impairment losses. If there is objective evidence of impairment, a write-down is transferred from our Consolidated Statement of Comprehensive Income, unrealized gains (losses) on available-for-sale securities, to our Consolidated Statement of Income in securities gains, other than trading.

The impairment loss on held-to-maturity securities is the difference between a security's carrying amount and the present value of its estimated future cash flows discounted at the original effective interest rate. If there is objective evidence of impairment, a write-down is recorded in our Consolidated Statement of Income in securities gains, other than trading.

For available-for-sale debt securities, a previous impairment loss is reversed through net income if an event occurs after the impairment was recognized that can be objectively attributed to an increase in fair value, to a maximum of the original impairment charge. For available-for-sale equity securities, previous impairment losses are not reversed through net income, and any subsequent increases in fair value are recorded in other comprehensive income. Reversals of impairment losses on held-to-maturity securities are recorded to a maximum of the amortized cost of the investment before the original impairment charge.

Loans

Loans are initially measured at fair value plus directly attributable costs, and are subsequently measured at amortized cost using the effective interest method. The effective interest method allocates interest income over the expected term of the loan by applying the effective interest rate to the carrying amount of the loan. The effective interest rate is defined as the rate that exactly discounts future cash receipts through the expected term of the loan to the net carrying amount of the loan. Under the effective interest method, the amount recognized in interest, dividend and fee income, loans, varies over the term of the loan based on the principal outstanding.

Allowance for Credit Losses

The allowance for credit losses adjusts the value of loans to reflect their estimated realizable value. In assessing their estimated realizable value, we must rely on estimates and exercise judgment regarding matters for which the ultimate outcome is unknown. These include economic factors, developments affecting companies in particular industries, and specific issues with respect to single borrowers. Changes in circumstances may cause future assessments of credit risk to be materially different from current assessments, which could result in an increase or decrease in the allowance for credit losses.

The allowance is comprised of a specific allowance and a collective allowance.

Specific Allowance

These allowances are recorded for individually identified impaired loans to reduce their carrying value to the expected recoverable amount. We review our loans on an ongoing basis to assess whether any loans should be classified as impaired and whether an allowance or write-off should be recorded (excluding credit card loans, which are classified as impaired and written off when principal or interest payments are 180 days past due, as discussed under Impaired Loans). The review of individually significant problem loans is conducted at least quarterly by the account managers, each of whom assesses the ultimate collectability and estimated recoveries for a specific loan based on all events and conditions that are relevant to the loan. This assessment is then reviewed and approved by an independent credit officer.

Individually Significant Impaired Loans

To determine the amount we expect to recover from an individually significant impaired loan, we use the value of the estimated future cash flows discounted at the loan's original effective interest rate. The determination of estimated future cash flows of a collateralized impaired loan reflects the expected realization of the underlying security, net of expected costs and any amounts legally required to be paid to the borrower. Security can vary by type of loan and may include cash, securities, real estate properties, accounts receivable, guarantees, inventory or other capital assets.

Individually Insignificant Impaired Loans

Residential mortgages, consumer instalment and other personal loans are individually insignificant and may be individually assessed or collectively assessed for losses at the time of impairment, taking into account historical loss experience.

Collective Allowance

We maintain a collective allowance in order to cover impairment in the existing portfolio for loans that have not yet been individually identified as impaired. Our approach to establishing and maintaining the collective allowance is based on the requirements of IAS 39, considering guidelines issued by OSFI.

The collective allowance methodology incorporates both quantitative and qualitative factors to determine an appropriate level for the collective allowance. For the purpose of calculating the collective allowance, we group loans on the basis of similarities in credit risk characteristics. The loss factors for groups of loans are determined based on a minimum of five years of historical data and a one-year loss emergence period, except for credit cards, where a seven-month loss emergence period is used. The loss factors are back-tested and calibrated on a regular basis to ensure that they continue to reflect our best estimate of losses that have been incurred but not yet identified, on an individual basis, within the pools of loans. Historical loss experience data is also reviewed in the determination of loss factors. Qualitative factors are based on current observable data, such as current macroeconomic and business conditions, portfolio-specific considerations and model risk factors.