



Manulife Financial Corporation Consolidated Financial Statements

For the year ended December 31, 2018

Responsibility for Financial Reporting

The accompanying consolidated financial statements of Manulife Financial Corporation are the responsibility of management and have been approved by the Board of Directors. It is also the responsibility of management to ensure that all information in the annual report to shareholders is consistent with these consolidated financial statements.

The consolidated financial statements have been prepared by management in accordance with International Financial Reporting Standards and the accounting requirements of the Office of the Superintendent of Financial Institutions, Canada. When alternative accounting methods exist, or when estimates and judgment are required, management has selected those amounts that present the Company's financial position and results of operations in a manner most appropriate to the circumstances.

Appropriate systems of internal control, policies and procedures have been maintained to ensure that financial information is both relevant and reliable. The systems of internal control are assessed on an ongoing basis by management and the Company's internal audit department.

The actuary appointed by the Board of Directors (the "Appointed Actuary") is responsible for ensuring that assumptions and methods used in the determination of policy liabilities are appropriate to the circumstances and that reserves will be adequate to meet the Company's future obligations under insurance and annuity contracts.

The Board of Directors is responsible for ensuring that management fulfills its responsibility for financial reporting and is ultimately responsible for reviewing and approving the consolidated financial statements. These responsibilities are carried out primarily through an Audit Committee of unrelated and independent directors appointed by the Board of Directors.

The Audit Committee meets periodically with management, the internal auditors, the external auditors and the Appointed Actuary to discuss internal control over the financial reporting process, auditing matters and financial reporting issues. The Audit Committee reviews the consolidated financial statements prepared by management and then recommends them to the Board of Directors for approval. The Audit Committee also recommends to the Board of Directors and shareholders the appointment of external auditors and approval of their fees.

The consolidated financial statements have been audited by the Company's external auditors, Ernst & Young LLP, in accordance with Canadian generally accepted auditing standards and the standards of the Public Company Accounting Oversight Board (United States). Ernst & Young LLP has full and free access to management and the Audit Committee.



Roy Gori
President and Chief Executive Officer



Philip Witherington
Chief Financial Officer

Toronto, Canada

February 13, 2019

Appointed Actuary's Report to the Shareholders

I have valued the policy liabilities and reinsurance recoverables of Manulife Financial Corporation for its Consolidated Statements of Financial Position as at December 31, 2018 and 2017 and their change in the Consolidated Statements of Income for the years then ended in accordance with actuarial practice generally accepted in Canada, including selection of appropriate assumptions and methods.

In my opinion, the amount of policy liabilities net of reinsurance recoverables makes appropriate provision for all policyholder obligations and the consolidated financial statements fairly present the results of the valuation.



Steven Finch
Appointed Actuary

Toronto, Canada

February 13, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of Manulife Financial Corporation

Opinion on the Consolidated Financial Statements

We have audited the consolidated financial statements of Manulife Financial Corporation (the “Company”), which comprise the Consolidated Statements of Financial Position as at December 31, 2018 and 2017, and the Consolidated Statements of Income, Consolidated Statements of Comprehensive Income, Consolidated Statements of Changes in Equity and Consolidated Statements of Cash Flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the consolidated financial position of the Company as at December 31, 2018 and 2017, and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with International Financial Reporting Standards 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 *Auditor’s Responsibilities for the Audit of the Consolidated Financial Statements* section of our report. We are independent of the Company 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.

Other Information

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

- Management’s Discussion and Analysis
- The information, other than the consolidated financial statements and our auditor’s report thereon, in the Annual Report.

Our opinion on the consolidated financial statements does not cover the other information and we do 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 and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated.

We obtained Management’s Discussion & Analysis prior to the date of this auditor’s report. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

The Annual Report is expected to be made available to us after the date of the auditor’s report. If based on the work we will perform on this other information, we conclude there is a material misstatement of other information, we are required to report that fact to those charged with governance.

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 International Financial Reporting Standards, 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 Company'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 Company or to cease operations, or has no realistic alternative but to do so.

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

Auditor's 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 auditor's 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 these 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 Company'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 Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's 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 auditor's report. However, future events or conditions may cause the Company 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.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Company 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.

We 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.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

The logo for Ernst & Young LLP is written in a stylized, cursive script. The letters are black and the font is fluid and handwritten in appearance.

Chartered Professional Accountants
Licensed Public Accountants

Toronto, Canada

February 13, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of Manulife Financial Corporation

Opinion on the Consolidated Financial Statements

We have audited the accompanying Consolidated Statements of Financial Position of Manulife Financial Corporation (the “Company”) as of December 31, 2018 and 2017, the related Consolidated Statements of Income, Consolidated Statements of Comprehensive Income, Consolidated Statements of Changes in Equity and Consolidated Statements of Cash Flows for the years then ended, and the related notes (collectively referred to as the “consolidated financial statements”).

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2018 and 2017, and its financial performance and its cash flows for the years then ended in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board.

Report on Internal Control over Financial Reporting

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (“PCAOB”), the Company’s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated February 13, 2019 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s 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 Company 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 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 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 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

The logo for Ernst & Young LLP is written in a black, cursive script font.

Chartered Professional Accountants
Licensed Public Accounts

We have served as Manulife Financial Corporation’s auditors since 1905.

Toronto, Canada

February 13, 2019

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors of Manulife Financial Corporation

Opinion on Internal Control over Financial Reporting

We have audited Manulife Financial Corporation's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the "COSO criteria"). In our opinion, Manulife Financial Corporation (the "Company") maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Consolidated Statements of Financial Position of the Company as of December 31, 2018 and 2017, and the related Consolidated Statements of Income, Consolidated Statements of Comprehensive Income, Consolidated Statements of Changes in Equity and Consolidated Statements of Cash Flows for the years then ended, and the related notes and our report dated February 13, 2019, expressed an unqualified opinion thereon.

Basis for Opinion

The Company'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 Management's Report on Internal Control Over Financial Reporting contained in the Management's Discussion and Analysis. Our responsibility is to express an opinion on the Company'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 Company 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 included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we 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 International Financial Reporting Standards as issued by the International Accounting Standards Board. 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 International Financial Reporting Standards as issued by the International Accounting Standards Board, 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.

The logo for Ernst & Young LLP, featuring the company name in a stylized, handwritten-style script.

Chartered Professional Accountants
Licensed Public Accountants

Toronto, Canada

February 13, 2019

Consolidated Statements of Financial Position

As at December 31,
(Canadian \$ in millions)

	2018	2017
Assets		
Cash and short-term securities	\$ 16,215	\$ 15,965
Debt securities	185,594	174,000
Public equities	19,179	21,545
Mortgages	48,363	44,742
Private placements	35,754	32,132
Policy loans	6,446	5,808
Loans to bank clients	1,793	1,737
Real estate	12,777	13,810
Other invested assets	27,543	24,483
Total invested assets (note 3)	353,664	334,222
Other assets		
Accrued investment income	2,427	2,182
Outstanding premiums	1,369	1,148
Derivatives (note 4)	13,703	15,569
Reinsurance assets (notes 7 and 8)	43,053	30,359
Deferred tax assets (note 5)	4,318	4,569
Goodwill and intangible assets (note 6)	10,097	9,840
Miscellaneous	8,431	7,337
Total other assets	83,398	71,004
Segregated funds net assets (note 22)	313,209	324,307
Total assets	\$ 750,271	\$ 729,533
Liabilities and Equity		
Liabilities		
Insurance contract liabilities (note 7)	\$ 328,654	\$ 304,605
Investment contract liabilities (note 8)	3,265	3,126
Deposits from bank clients	19,684	18,131
Derivatives (note 4)	7,803	7,822
Deferred tax liabilities (note 5)	1,814	1,281
Other liabilities	15,190	14,927
	376,410	349,892
Long-term debt (note 10)	4,769	4,784
Capital instruments (note 11)	8,732	8,387
Segregated funds net liabilities (note 22)	313,209	324,307
Total liabilities	703,120	687,370
Equity		
Preferred shares (note 12)	3,822	3,577
Common shares (note 12)	22,961	22,989
Contributed surplus	265	277
Shareholders' retained earnings	12,704	10,083
Shareholders' accumulated other comprehensive income (loss):		
Pension and other post-employment plans	(426)	(364)
Available-for-sale securities	(265)	179
Cash flow hedges	(127)	(109)
Real estate revaluation surplus	20	21
Translation of foreign operations	7,010	4,360
Total shareholders' equity	45,964	41,013
Participating policyholders' equity	94	221
Non-controlling interests	1,093	929
Total equity	47,151	42,163
Total liabilities and equity	\$ 750,271	\$ 729,533

The accompanying notes are an integral part of these Consolidated Financial Statements.



Roy Gori
President and Chief Executive Officer



John Cassaday
Chairman of the Board of Directors

Consolidated Statements of Income

For the years ended December 31,

(Canadian \$ in millions except per share amounts)

	2018	2017
Revenue		
Premium income		
Gross premiums	\$ 39,150	\$ 36,361
Premiums ceded to reinsurers	(15,138)	(8,151)
Net premiums	24,012	28,210
Investment income (note 3)		
Investment income	13,560	13,649
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on the macro hedge program	(9,028)	5,718
Net investment income	4,532	19,367
Other revenue (note 14)	10,428	10,746
Total revenue	38,972	58,323
Contract benefits and expenses		
To contract holders and beneficiaries		
Gross claims and benefits (note 7)	27,878	24,994
Increase (decrease) in insurance contract liabilities	2,907	20,023
Increase (decrease) in investment contract liabilities	35	173
Benefits and expenses ceded to reinsurers	(5,153)	(8,158)
Decrease (increase) in reinsurance assets (note 7)	(9,733)	2,269
Net benefits and claims	15,934	39,301
General expenses	7,957	7,233
Investment expenses (note 3)	1,708	1,673
Commissions	6,173	6,116
Interest expense	1,275	1,139
Net premium taxes	406	360
Total contract benefits and expenses	33,453	55,822
Income before income taxes	5,519	2,501
Income tax expense (note 5)	(632)	(239)
Net income	\$ 4,887	\$ 2,262
Net income (loss) attributed to:		
Non-controlling interests	\$ 214	\$ 194
Participating policyholders	(127)	(36)
Shareholders	4,800	2,104
	\$ 4,887	\$ 2,262
Net income attributed to shareholders	4,800	2,104
Preferred share dividends	(168)	(159)
Common shareholders' net income	\$ 4,632	\$ 1,945
Earnings per share		
Basic earnings per common share (note 12)	\$ 2.34	\$ 0.98
Diluted earnings per common share (note 12)	2.33	0.98
Dividends per common share	0.91	0.82

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Comprehensive Income

For the years ended December 31,
(Canadian \$ in millions)

	2018	2017
Net income	\$ 4,887	\$ 2,262
Other comprehensive income (loss) ("OCI"), net of tax:		
Items that may be subsequently reclassified to net income:		
Foreign exchange gains (losses) on:		
Translation of foreign operations	3,078	(2,256)
Net investment hedges	(428)	227
Available-for-sale financial securities:		
Unrealized gains (losses) arising during the year	(458)	601
Reclassification of net realized (gains) losses and impairments to net income	13	(32)
Cash flow hedges:		
Unrealized gains (losses) arising during the year	(34)	110
Reclassification of realized losses to net income	16	13
Share of other comprehensive income (losses) of associates	(1)	1
Total items that may be subsequently reclassified to net income	2,186	(1,336)
Items that will not be reclassified to net income:		
Change in pension and other post-employment plans	(62)	53
Real estate revaluation reserve	(1)	30
Total items that will not be reclassified to net income	(63)	83
Other comprehensive income (loss), net of tax	2,123	(1,253)
Total comprehensive income (loss), net of tax	\$ 7,010	\$ 1,009
Total comprehensive income (loss) attributed to:		
Non-controlling interests	\$ 212	\$ 192
Participating policyholders	(127)	(27)
Shareholders	6,925	844

Income Taxes included in Other Comprehensive Income

For the years ended December 31,
(Canadian \$ in millions)

	2018	2017
Income tax expense (recovery) on:		
Unrealized foreign exchange gains/losses on translation of foreign operations	\$ 1	\$ (1)
Unrealized foreign exchange gains/losses on net investment hedges	(62)	48
Unrealized gains/losses on available-for-sale financial securities	(151)	284
Reclassification of realized gains/losses and recoveries/impairments to net income on available-for-sale financial securities	26	7
Unrealized gains/losses on cash flow hedges	31	49
Reclassification of realized gains/losses to net income on cash flow hedges	4	3
Change in pension and other post-employment plans	4	37
Real estate revaluation reserve	1	9
Total income tax expense (recovery)	\$ (146)	\$ 436

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Changes in Equity

For the years ended December 31,
(Canadian \$ in millions)

	2018	2017
Preferred shares		
Balance, beginning of year	\$ 3,577	\$ 3,577
Issued (note 12)	250	–
Issuance costs, net of tax	(5)	–
Balance, end of year	3,822	3,577
Common shares		
Balance, beginning of year	22,989	22,865
Repurchased (note 12)	(269)	–
Issued on exercise of stock options	59	124
Issued under dividend reinvestment and share purchase plans	182	–
Balance, end of year	22,961	22,989
Contributed surplus		
Balance, beginning of year	277	284
Exercise of stock options and deferred share units	(10)	(22)
Stock option expense	10	15
Acquisition of non-controlling interest	(12)	–
Balance, end of year	265	277
Shareholders' retained earnings		
Balance, beginning of year	10,083	9,759
Net income attributed to shareholders	4,800	2,104
Common shares repurchased (note 12)	(209)	–
Preferred share dividends	(168)	(159)
Common share dividends	(1,802)	(1,621)
Balance, end of year	12,704	10,083
Shareholders' accumulated other comprehensive income (loss) ("AOCI")		
Balance, beginning of year	4,087	5,347
Change in unrealized foreign exchange gains (losses) of net foreign operations	2,650	(2,029)
Change in actuarial gains (losses) on pension and other post-employment plans	(62)	53
Change in unrealized gains (losses) on available-for-sale financial securities	(443)	572
Change in unrealized gains (losses) on derivative instruments designated as cash flow hedges	(18)	123
Change in real estate revaluation reserve	(1)	20
Share of other comprehensive income (losses) of associates	(1)	1
Balance, end of year	6,212	4,087
Total shareholders' equity, end of year	45,964	41,013
Participating policyholders' equity		
Balance, beginning of year	221	248
Net income (loss) attributed to participating policyholders	(127)	(36)
Other comprehensive income attributed to policyholders	–	9
Balance, end of year	94	221
Non-controlling interests		
Balance, beginning of year	929	743
Net income attributed to non-controlling interests	214	194
Other comprehensive income (loss) attributed to non-controlling interests	(2)	(2)
Contributions (distributions), net	(48)	(6)
Balance, end of year	1,093	929
Total equity, end of year	\$ 47,151	\$ 42,163

The accompanying notes are an integral part of these Consolidated Financial Statements.

Consolidated Statements of Cash Flows

For the years ended December 31,
(Canadian \$ in millions)

	2018	2017
Operating activities		
Net income	\$ 4,887	\$ 2,262
Adjustments:		
Increase in insurance contract liabilities	2,907	20,023
Increase in investment contract liabilities	35	173
(Increase) decrease in reinsurance assets excluding coinsurance transactions (note 7)	893	2,269
Amortization of (premium) discount on invested assets	212	230
Other amortization	747	560
Net realized and unrealized (gains) losses and impairment on assets	8,727	(7,188)
Deferred income tax expense (recovery)	930	(331)
Restructuring charge	156	–
Stock option expense	10	15
Cash provided by operating activities before undernoted items	19,504	18,013
Changes in policy related and operating receivables and payables	(316)	(222)
Cash provided by (used in) operating activities	19,188	17,791
Investing activities		
Purchases and mortgage advances	(101,172)	(87,224)
Disposals and repayments	82,111	70,720
Change in investment broker net receivables and payables	(128)	227
Net cash decrease from sale and purchase of subsidiaries and businesses	187	(10)
Cash provided by (used in) investing activities	(19,002)	(16,287)
Financing activities		
Increase (decrease) in repurchase agreements and securities sold but not yet purchased	(189)	(29)
Redemption of long-term debt (note 10)	(400)	(607)
Issue of capital instruments, net (note 11)	597	2,209
Redemption of capital instruments (note 11)	(450)	(899)
Secured borrowing from securitization transactions	250	741
Changes in deposits from Bank clients, net	1,490	261
Shareholders' dividends paid in cash	(1,788)	(1,780)
Contributions from (distributions to) non-controlling interests, net	(60)	(6)
Common shares repurchased (note 12)	(478)	–
Common shares issued, net (note 12)	59	124
Preferred shares issued, net (note 12)	245	–
Cash provided by (used in) financing activities	(724)	14
Cash and short-term securities		
Increase (decrease) during the year	(538)	1,518
Effect of foreign exchange rate changes on cash and short-term securities	822	(658)
Balance, beginning of year	15,098	14,238
Balance, December 31	15,382	15,098
Cash and short-term securities		
Beginning of year		
Gross cash and short-term securities	15,965	15,151
Net payments in transit, included in other liabilities	(867)	(913)
Net cash and short-term securities, January 1	15,098	14,238
End of year		
Gross cash and short-term securities	16,215	15,965
Net payments in transit, included in other liabilities	(833)	(867)
Net cash and short-term securities, December 31	\$ 15,382	\$ 15,098
Supplemental disclosures on cash flow information		
Interest received	\$ 10,952	\$ 10,596
Interest paid	1,212	1,118
Income taxes paid	461	1,360

The accompanying notes are an integral part of these Consolidated Financial Statements.

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Notes to Consolidated Financial Statements

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Notes to Consolidated Financial Statements

(Canadian \$ in millions except per share amounts or unless otherwise stated)

Note 1 Nature of Operations and Significant Accounting Policies

(a) Reporting entity

Manulife Financial Corporation ("MFC") is a publicly traded company and the holding company of The Manufacturers Life Insurance Company ("MLI"), a Canadian life insurance company. MFC and its subsidiaries (collectively, "Manulife" or the "Company") is a leading financial services group with principal operations in Asia, Canada and the United States. Manulife's international network of employees, agents and distribution partners offers financial protection and wealth management products and services to personal and business clients as well as asset management services to institutional customers. The Company operates as Manulife in Canada and Asia and as John Hancock in the United States.

MFC is domiciled in Canada and incorporated under the Insurance Companies Act (Canada) ("ICA"). These Consolidated Financial Statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board ("IASB").

These Consolidated Financial Statements should be read in conjunction with "Risk Management" in the 2018 Management's Discussion and Analysis ("MD&A") dealing with IFRS 7 "Financial Instruments: Disclosures" as the discussion on market risk and liquidity risk includes certain disclosures that are considered an integral part of these Consolidated Financial Statements.

These Consolidated Financial Statements as at and for the year ended December 31, 2018 were authorized for issue by MFC's Board of Directors on February 13, 2019.

(b) Basis of preparation

The preparation of Consolidated Financial Statements in conformity with IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets and liabilities, and the disclosure of contingent assets and liabilities as at the date of the Consolidated Financial Statements, and the reported amounts of revenue and expenses during the reporting periods. Actual results may differ from these estimates. The most significant estimation processes relate to assumptions used in measuring insurance and investment contract liabilities, assessing assets for impairment, determining of pension and other post-employment benefit obligation and expense assumptions, determining income taxes and uncertain tax positions and fair valuation of certain invested assets. Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimates are revised and in any future years affected. Although some variability is inherent in these estimates, management believes that the amounts recorded are appropriate. The significant accounting policies used and the most significant judgments made by management in applying these accounting policies in the preparation of these Consolidated Financial Statements are summarized below.

(c) Fair value measurement

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction (not a forced liquidation or distress sale) between market participants at the measurement date, that is, an exit value.

When available, quoted market prices are used to determine fair value. If quoted market prices are not available, fair value is typically based upon alternative valuation techniques such as discounted cash flows, matrix pricing, consensus pricing services and other techniques. Broker quotes are generally used when external public vendor prices are not available.

The Company has a process in place that includes a review of price movements relative to the market, a comparison of prices between vendors, and a comparison to internal matrix pricing which uses predominately external observable data. Judgment is applied in adjusting external observable data for items including liquidity and credit factors.

The Company categorizes its fair value measurements according to a three-level hierarchy. The hierarchy prioritizes the inputs used by the Company's valuation techniques. A level is assigned to each fair value measurement based on the lowest level input significant to the fair value measurement in its entirety. The three levels of the fair value hierarchy are defined as follows:

Level 1 – Fair value measurements that reflect unadjusted, quoted prices in active markets for identical assets and liabilities that the Company can access at the measurement date reflecting market transactions.

Level 2 – Fair value measurements using inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in inactive markets, inputs that are observable that are not prices (such as interest rates, credit risks, etc.) and inputs that are derived from or corroborated by observable market data. Most debt securities are classified within Level 2. Also, included in the Level 2 category are derivative instruments that are priced using models with observable market inputs, including interest rate swaps, equity swaps, and foreign currency forward contracts.

Level 3 – Fair value measurements using significant non-market observable inputs. These include valuations for assets and liabilities that are derived using data, some or all of which is not market observable, including assumptions about risk. Level 3 securities include less liquid securities such as structured asset-backed securities, commercial mortgage-backed securities ("CMBS"), certain long-duration bonds and other securities that have little or no price transparency. Certain derivative financial instruments and investment properties are also included in Level 3.

(d) Basis of consolidation

MFC consolidates the financial statements of all entities, including certain structured entities that it controls. Subsidiaries are entities controlled by the Company. The Company has control over an entity when the Company has the power to govern the financial and operating policies of the entity, is exposed to variable returns from its activities which are significant in relation to the total variable returns of the entity and the Company is able to use its power over the entity to affect its share of variable returns. In assessing control, significant judgment is applied while considering all relevant facts and circumstances. When assessing decision-making power, the Company considers the extent of its rights relative to the management of an entity, the level of voting rights held in an entity which are potentially or presently exercisable, the existence of any contractual management agreements which may provide the Company with power over an entity's financial and operating policies and to the extent of other parties' ownership in an entity, if any, the possibility for de facto control being present. When assessing returns, the Company considers the significance of direct and indirect financial and non-financial variable returns to the Company from an entity's activities in addition to the proportionate significance of such returns. The Company also considers the degree to which its interests are aligned with those of other parties investing in an entity and the degree to which it may act in its own interest.

The financial statements of subsidiaries are included in MFC's consolidated results from the date control is established and are excluded from consolidation from the date control ceases. The initial control assessment is performed at inception of the Company's involvement with the entity and is reconsidered at a later date if the Company acquires or loses power over key operating and financial policies of the entity; acquires additional interests or disposes of interests in the entity; the contractual arrangements of the entity are amended such that the Company's proportionate exposure to variable returns changes; or if the Company's ability to use its power to affect its variable returns from the entity changes.

The Company's Consolidated Financial Statements have been prepared using uniform accounting policies for like transactions and events in similar circumstances. Intercompany balances, and income and expenses arising from intercompany transactions, have been eliminated in preparing the Consolidated Financial Statements.

Non-controlling interests are interests of other parties in the equity of MFC's subsidiaries and are presented within total equity, separate from the equity of MFC's shareholders. Non-controlling interests in the net income and other comprehensive income ("OCI") of MFC's subsidiaries are included in total net income and total OCI, respectively. An exception to this occurs where the subsidiary's shares are required to be redeemed for cash on a fixed or determinable date, in which case other parties' interests in the subsidiary's capital are presented as liabilities of the Company and other parties' non-controlling interests in the subsidiary's income and OCI are recorded as expenses of the Company.

The equity method of accounting is used to account for entities over which the Company has significant influence ("associates" or "joint ventures"), whereby the Company records its share of the associate's or joint venture's net assets and financial results using uniform accounting policies for similar transactions and events. Significant judgment is used to determine whether voting rights, contractual management and other relationships with the entity, if any, provide the Company with significant influence or joint control over the entity. Gains and losses on the sale of associates or joint ventures are included in income when realized, while impairment losses are recognized immediately when there is objective evidence of impairment. Gains and losses on commercial transactions with associates or joint ventures are eliminated to the extent of the Company's interest in the associate or joint venture. Investments in associates or joint ventures are included in other invested assets on the Company's Consolidated Statements of Financial Position.

(e) Invested assets

Invested assets that are considered financial instruments are classified as fair value through profit or loss ("FVTPL"), loans and receivables, or as available-for-sale ("AFS") financial assets. The Company determines the classification of its financial assets at initial recognition. Invested assets are recognized initially at fair value plus, in the case of investments not at FVTPL, directly attributable transaction costs. Invested assets are classified as financial instruments at FVTPL if they are held for trading, if they are designated by management under the fair value option, or if they are designated by management when they include one or more embedded derivatives. Invested assets classified as AFS are non-derivative financial assets that do not fall into any of the other categories described above.

Valuation methods for the Company's invested assets are described above. All fair value valuations are performed in accordance with IFRS 13 "Fair Value Measurement". Disclosure of financial instruments carried at fair value with the three levels of the fair value hierarchy and the disclosure of the fair value for financial instruments not carried at fair value on the Consolidated Statements of Financial Position are presented in note 3. Fair value valuations are performed by the Company and by third-party service providers. When third-party service providers are engaged, the Company performs a variety of procedures to corroborate pricing information. These procedures may include, but are not limited to, inquiry and review of valuation techniques, inputs to the valuation and vendor controls reports.

Cash and short-term securities comprise of cash, current operating accounts, overnight bank and term deposits, and fixed income securities held for meeting short-term cash commitments. Short-term securities are carried at fair value. Short-term securities are comprised of investments due to mature within one year of the date of purchase. Commercial paper and discount notes are classified as Level 2 because these securities are typically not actively traded. Net payments in transit and overdraft bank balances are included in other liabilities.

Debt securities are carried at fair value. Debt securities are generally valued by independent pricing vendors using proprietary pricing models incorporating current market inputs for similar instruments with comparable terms and credit quality (matrix pricing). The

significant inputs include, but are not limited to, yield curves, credit risks and spreads, measures of volatility and prepayment rates. These debt securities are classified as Level 2 but can be Level 3 if significant inputs are market unobservable. Realized gains and losses on sale of debt securities and unrealized gains and losses on debt securities designated as FVTPL are recognized in investment income immediately. Unrealized gains and losses on AFS debt securities are recorded in OCI, except for unrealized gains and losses on foreign currency translation which are included in income. Impairment losses on AFS debt securities are recognized in income on an individual security basis when there is objective evidence of impairment. Impairment is considered to have occurred, based on management's judgment, when it is deemed probable that the Company will not be able to collect all amounts due according to the debt security's contractual terms.

Equities are comprised of common and preferred equities and are carried at fair value. Equities are generally classified as Level 1, as fair values are normally based on quoted market prices. Realized gains and losses on sale of equities and unrealized gains and losses on equities designated as FVTPL are recognized in investment income immediately. Unrealized gains and losses on AFS equities are recorded in OCI. Impairment losses on AFS equities are recognized in income on an individual security basis when there is objective evidence of impairment. Impairment is considered to have occurred when fair value has declined below cost by a significant amount or for a prolonged period of time. Judgment is applied in determining whether the decline is significant or prolonged.

Mortgages are carried at amortized cost and are classified as Level 3 for fair value purposes due to the lack of market observability of certain significant valuation inputs. Realized gains and losses are recorded in investment income immediately. Impairment losses are recorded on mortgages when there is no longer reasonable assurance as to the timely collection of the full amount of principal and interest and are measured based on the discounted value of expected future cash flows at the original effective interest rates inherent in the mortgage. Expected future cash flows of impaired mortgages are typically determined with reference to the fair value of collateral security underlying the mortgage, net of expected costs of realization and any applicable insurance recoveries. Significant judgment is applied in the determination of impairment including the timing and amount of future collections.

The Company accounts for insured and uninsured mortgage securitizations as secured financing transactions since the criteria for sale accounting are not met. For these transactions, the Company continues to recognize the mortgages and records a liability in other liabilities for the amounts owed at maturity. Interest income from these mortgages and interest expense on the borrowings are recorded using the effective interest rate method.

Private placements, which include corporate loans for which there is no active market, are carried at amortized cost and are generally classified as Level 2 for fair value disclosure purposes or as Level 3 if significant inputs are market unobservable. Realized gains and losses are recorded in income immediately. Impairment losses are recorded on private placements when there is no longer assurance as to the timely collection of the full amount of principal and interest. Impairment is measured based on the discounted value of expected future cash flows at the original effective interest rate inherent in the loan. Significant judgment is applied in the determination of impairment including the timing and amount of future collections.

Policy loans are carried at an amount equal to their unpaid balances and are classified as Level 2 for fair value disclosure purposes. Policy loans are fully collateralized by the cash surrender value of the underlying policies.

Loans to Manulife Bank of Canada ("Manulife Bank" or "Bank") clients are carried at amortized cost, and are classified as Level 2 for fair value disclosure purposes. A loan to a Bank client is considered impaired when there is objective evidence of impairment because of one or more loss events that have occurred after initial recognition, with a negative impact on the estimated future cash flows of the loan.

Once established, allowances for impairment of mortgages, private placements and loans to Bank clients are reversed only if the conditions that caused the impairment no longer exist. Reversals of impairment charges on AFS debt securities are only recognized in income to the extent that increases in fair value can be attributed to events after the impairment loss being recorded. Impairment losses for AFS equity instruments are not reversed through income. On disposition of an impaired asset, any allowance for impairment is released.

In addition to impairments and provisions for loan losses (recoveries) reported in investment income, the measurement of insurance contract liabilities, via investment return assumptions, includes expected future credit losses on fixed income investments. Refer to note 7(d).

Interest income is recognized on debt securities, mortgages, private placements, policy loans and loans to Bank clients as it accrues and is calculated using the effective interest rate method. Premiums, discounts and transaction costs are amortized over the life of the underlying investment using the effective yield method for all debt securities as well as mortgages and private placements measured at amortized cost.

The Company records purchases and sales of invested assets on a trade date basis, except for loans originated by the Company, which are recognized on a settlement date basis.

Real estate consists of both own use and investment property. Own use property is carried at cost less accumulated depreciation and any accumulated impairment losses. Depreciation is calculated based on the cost of an asset less its residual value and is recognized in income on a straight-line basis over the estimated useful life ranging from 30 to 60 years. Impairment losses are recorded in income to the extent the recoverable amount is less than the carrying amount. Where own use property is included in assets backing insurance contract liabilities, the fair value of the property is used in the valuation of insurance contract liabilities. Own use property is classified as Level 3 for fair value disclosure purposes.

An investment property is a property held to earn rental income, for capital appreciation, or both. Investment properties are measured at fair value, with changes in fair value recognized in income. Fair value is determined using external appraisals that are based on the highest and best use of the property. The valuation techniques used include discounted cash flows, the direct capitalization method as well as comparable sales analysis and include both observable and unobservable inputs. Inputs include existing and assumed tenancies, market data from recent comparable transactions, future economic outlook and market risk assumptions, capitalization rates and internal rates of return. Investment properties are classified as Level 3 for fair value disclosure purposes.

When a property changes from own use to investment property, any gain arising on the remeasurement of the property to fair value at the date of transfer is recognized in OCI, to the extent that it is not reversing a previous impairment loss. Reversals of impairment losses are recognized in income.

Other invested assets include private equity and property investments held in power and infrastructure and timber, as well as in agriculture and oil and gas sectors. Private equity investments are accounted for as associates using the equity method (as described in note 1(d) above) or are classified as FVTPL or AFS and carried at fair value. Investments in oil and gas exploration and evaluation activities are measured on the cost basis using the "successful efforts" method. Timber and agriculture properties are measured at fair value with changes in fair value recognized in income, except for buildings, equipment and bearer plants which are measured at amortized cost. The fair value of other invested assets is determined using a variety of valuation techniques as described in note 3. Other invested assets that are measured or disclosed at fair value are classified as Level 3.

Other invested assets also include investments in leveraged leases, which are accounted for using the equity method. The carrying value under the equity method reflects the amortized cost of the lease receivable and related non-recourse debt using the effective yield method.

(f) Goodwill and intangible assets

Goodwill represents the difference between the purchase consideration of an acquired business and the Company's proportionate share of the net identifiable assets acquired. It is initially recorded at cost and subsequently measured at cost less any accumulated impairment.

Goodwill is tested for impairment at least annually and whenever events or changes in circumstances indicate that the carrying amounts may not be recoverable at the cash generating unit ("CGU") or group of CGUs level. The Company allocates goodwill to CGUs or groups of CGUs for impairment testing based on the lowest level within the entity in which the goodwill is monitored for internal management purposes. The allocation is made to those CGUs or groups of CGUs that are expected to benefit from the business combination in which the goodwill arose. Any potential impairment of goodwill is identified by comparing the recoverable amount of a CGU or group of CGUs to its carrying value. Goodwill is reduced by the amount of deficiency, if any. If the deficiency exceeds the carrying amount of goodwill, the carrying values of the remaining assets in the CGU or group of CGUs are subject to being reduced by the excess on a pro-rata basis.

The recoverable amount of a CGU is the higher of the estimated fair value less costs to sell or the value-in-use of the CGU. In assessing value-in-use, estimated future cash flows are discounted using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset. In some cases, the most recent detailed calculation made in a prior period of the recoverable amount of a CGU is used in the testing of impairment of goodwill in the current period. This is the case only if there are no significant changes to the CGU, the likelihood of impairment is remote based on the analysis of current events and circumstances, and the most recent recoverable amount substantially exceeds the carrying amount of the CGU.

Intangible assets with indefinite useful lives include the John Hancock brand name and certain investment management contracts. The indefinite useful life assessment for brand is based on the brand name being protected in markets where branded products are sold by trademarks, which are renewable indefinitely, and for certain investment management contracts due to the ability to renew these contracts indefinitely. In addition, there are no legal, regulatory or contractual provisions that limit the useful lives of these intangible assets. An intangible asset with an indefinite useful life is not amortized but is subject to an annual impairment test which is performed more frequently if there is an indication that it is not recoverable.

Intangible assets with finite useful lives include acquired distribution networks, customer relationships, capitalized software, certain investment management contracts and other contractual rights. Distribution networks, customer relationships, and other finite life intangible assets are amortized over their estimated useful lives, six to 68 years, either based on straight-line or in relation to other asset consumption metrics. Software intangible assets are amortized on a straight-line basis over their estimated useful lives of three to five years. Finite life intangible assets are assessed for indicators of impairment at each reporting period. If any indication of impairment exists, these assets are subject to an impairment test.

(g) Miscellaneous assets

Miscellaneous assets include assets held in a rabbi trust with respect to unfunded defined benefit obligations, defined benefit assets, if any (refer to note 1(o)), deferred acquisition costs and capital assets. Deferred acquisition costs are carried at cost less accumulated amortization. These costs are recognized over the period where redemption fees may be charged or over the period revenue is earned. Capital assets are carried at cost less accumulated amortization computed on a straight-line basis over their estimated useful lives, which vary from two to 10 years.

(h) Segregated funds

The Company manages several segregated funds on behalf of policyholders. The investment returns on these funds are passed directly to policyholders. In some cases, the Company has provided guarantees associated with these funds.

Segregated funds net assets are measured at fair value and primarily include investments in mutual funds, debt securities, equities, cash, short-term investments and other investments. With respect to the consolidation requirement of IFRS, in assessing the Company's degree of control over the underlying investments, the Company considers the scope of its decision-making rights, the rights held by other parties, its remuneration as an investment manager and its exposure to variability of returns. The Company has determined that it does not have control over the underlying investments as it acts as an agent on behalf of segregated fund policyholders.

The methodology applied to determine the fair value of investments held in segregated funds is consistent with that applied to invested assets held by the general fund, as described above in note 1(e). Segregated funds liabilities are measured based on the value of the segregated funds net assets. Investment returns on segregated funds assets belong to policyholders and the Company does not bear the risk associated with these assets outside of guarantees offered on certain variable life and annuity products, for which the underlying investments are held within segregated funds. Accordingly, investment income earned by segregated funds and expenses incurred by segregated funds are offset and are not separately presented in the Consolidated Statements of Income. Fee income earned by the Company for managing the segregated funds is included in other revenue.

Liabilities related to guarantees associated with certain segregated funds, as a result of certain variable life and annuity contracts, are recorded within the Company's insurance contract liabilities. The Company holds assets supporting these guarantees which are recognized in invested assets according to their investment type.

(i) Insurance and investment contract liabilities

Most contracts issued by the Company are considered insurance, investment or service contracts. Contracts under which the Company accepts significant insurance risk from a policyholder are classified as insurance contracts in the Consolidated Financial Statements. A contract is considered to have significant insurance risk if, and only if, an insured event could cause an insurer to make significant additional payments in any scenario, excluding scenarios that lack commercial substance at the inception of the contract. Contracts under which the Company does not accept significant insurance risk are either classified as investment contracts or considered service contracts and are accounted for in accordance with IAS 39 "Financial Instruments: Recognition and Measurement" or IFRS 15 "Revenue from Contracts with customers", respectively.

Once a contract has been classified as an insurance contract it remains an insurance contract even if the insurance risk reduces significantly. Investment contracts can be reclassified as insurance contracts if insurance risk subsequently becomes significant.

Insurance contract liabilities, net of reinsurance assets, represent the amount which, together with estimated future premiums and net investment income, will be sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (other than income taxes) and expenses on policies in-force. Insurance contract liabilities are presented gross of reinsurance assets on the Consolidated Statements of Financial Position. The Company's Appointed Actuary is responsible for determining the amount of insurance contract liabilities in accordance with standards established by the Canadian Institute of Actuaries. Insurance contract liabilities, net of reinsurance assets, have been determined using the Canadian Asset Liability Method ("CALM") as permitted by IFRS 4 "Insurance Contracts". Refer to note 7.

Investment contract liabilities include contracts issued to retail and institutional investors that do not contain significant insurance risk. Investment contract liabilities and deposits are measured at amortized cost or at fair value by election. The election reduces accounting mismatches between assets supporting these contracts and the related policy liabilities. Investment contract liabilities are derecognized when the contract expires, is discharged or is cancelled.

Derivatives embedded within insurance contracts are separated if they are not considered to be closely related to the host insurance contract and do not meet the definition of an insurance contract. These embedded derivatives are presented separately in other assets or other liabilities and are measured at fair value with changes in fair value recognized in income.

(j) Reinsurance assets

The Company uses reinsurance in the normal course of business to manage its risk exposure. Insurance ceded to a reinsurer does not relieve the Company from its obligations to policyholders. The Company remains liable to its policyholders for the portion reinsured to the extent that any reinsurer does not meet its obligations for reinsurance ceded to it under a reinsurance agreement.

Reinsurance assets represent the benefit derived from reinsurance agreements in-force at the reporting date, considering the financial condition of the reinsurer. Amounts recoverable from reinsurers are estimated in accordance with the terms of the relevant reinsurance contract.

Gains or losses on reinsurance transactions are recognized in income immediately on the transaction date and are not amortized. Premiums ceded and claims reimbursed are presented on a gross basis on the Consolidated Statements of Income. Reinsurance assets are not offset against the related insurance contract liabilities and are presented separately on the Consolidated Statements of Financial Position. Refer to note 7(a).

(k) Other financial instruments accounted for as liabilities

The Company issues a variety of other financial instruments classified as liabilities, including notes payable, term notes, senior notes, senior debentures, subordinated notes, surplus notes, subscription receipts and preferred shares. These financial liabilities are measured at amortized cost, with issuance costs deferred and amortized using the effective interest rate method.

(l) Income taxes

The provision for income taxes is calculated based on income tax laws and income tax rates substantively enacted as at the date of the Consolidated Statements of Financial Position. The income tax provision is comprised of current income taxes and deferred income taxes. Current and deferred income taxes relating to items recognized in OCI and directly in equity are similarly recognized in OCI and directly in equity, respectively.

Current income taxes are amounts expected to be payable or recoverable for the current year and any adjustments to taxes payable in respect of previous years.

Deferred income taxes are provided for using the liability method and result from temporary differences between the carrying values of assets and liabilities and their respective tax bases. Deferred income taxes are measured at the substantively enacted tax rates that are expected to be applied to temporary differences when they reverse.

A deferred tax asset is recognized to the extent that future realization of the tax benefit is probable. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the tax benefit will be realized. Deferred tax assets and liabilities are offset if there is a legally enforceable right to offset current tax liabilities and assets and they relate to income taxes levied by the same tax authority on the same taxable entity.

Deferred tax liabilities are recognized for all taxable temporary differences, except in respect of taxable temporary differences associated with investments in subsidiaries, associates and joint ventures, where the timing of the reversal of the temporary differences can be controlled and it is probable that the temporary differences will not reverse in the foreseeable future.

The Company records provisions for uncertain tax positions if it is probable that the Company will make a payment on tax positions due to examinations by tax authorities. These provisions are measured at the Company's best estimate of the amount expected to be paid. Provisions are reversed to income in the period in which management assesses they are no longer required or determined by statute.

The Company is subject to income tax laws in various jurisdictions. Tax laws are complex and potentially subject to different interpretations by the taxpayer and the relevant tax authority. The provision for income taxes and deferred income taxes represents management's interpretation of the relevant tax laws and its estimate of current and future income tax implications of the transactions and events during the year. The Company may be required to change its provision for income taxes or deferred income tax balances when the ultimate deductibility of certain items is successfully challenged by taxing authorities, or if estimates used in determining the amount of deferred tax asset to recognize change significantly, or when receipt of new information indicates the need for adjustment in the amount of deferred income taxes to be recognized. Additionally, future events, such as changes in tax laws, tax regulations, or interpretations of such laws or regulations, could have an impact on the provision for income taxes, deferred tax balances and the effective tax rate. Any such changes could materially affect the amounts reported in the Consolidated Financial Statements in the period these changes occur.

(m) Foreign currency translation

Items included in the financial statements of each of the Company's subsidiaries are measured by each subsidiary using the currency of the primary economic environment in which the entity operates (the "functional currency").

Transactions in a foreign currency are translated to the functional currency at the exchange rate prevailing at the date of the transaction. Assets and liabilities denominated in foreign currencies are translated to the functional currency at the exchange rate in effect at the reporting date. Revenue and expenses denominated in foreign currencies are translated at the average exchange rate prevailing during the quarter reported. Exchange gains and losses are recognized in income except for translation of net investments in foreign operations and the results of hedging these positions. These foreign exchange gains and losses are recognized in OCI until such time that the foreign operation is disposed of or control or significant influence over it is lost.

(n) Stock-based compensation

The Company provides stock-based compensation to certain employees and directors as described in note 15. Compensation expense of equity instruments is accrued based on the best estimate of the number of instruments expected to vest, with revisions made to that estimate if subsequent information indicates that actual forfeitures are likely to differ from initial estimates, unless forfeitures are due to market-based conditions.

Stock options are expensed with a corresponding increase in contributed surplus. Restricted share units and deferred share units are expensed with a corresponding liability accrued based on the market value of MFC's common shares at the end of each quarter. Performance share units are expensed with a corresponding liability accrued based on specific performance conditions and the market value of MFC's common shares at the end of each quarter. The change in the value of the awards resulting from changes in the market value of MFC's common shares or changes in the specific performance conditions and credited dividends is recognized in income, offset by the impact of total return swaps used to manage the variability of the related liability.

Stock-based compensation cost is recognized over the applicable vesting period, except if the employee is eligible to retire at the time of grant or will be eligible to retire during the vesting period. Compensation cost, attributable to stock options, restricted share units, and performance share units granted to employees who are eligible to retire on the grant date or who will become eligible to retire during the vesting period, is recognized at the grant date or over the period from the grant date to the date of retirement eligibility, respectively.

The Company's contributions to the Global Share Ownership Plan ("GSOP") (refer to note 15(d)), are expensed as incurred. Under the GSOP, subject to certain conditions, the Company will match a percentage of an employee's eligible contributions to certain maximums. All contributions are used by the plan's trustee to purchase MFC common shares in the open market.

(o) Employee future benefits

The Company maintains defined contribution and defined benefit pension plans and other post-employment plans for employees and agents including registered (tax qualified) pension plans that are typically funded as well as supplemental non-registered (non-qualified) pension plans for executives, retiree and disability welfare plans that are typically not funded.

The Company's obligation in respect of defined benefit pension and other post-employment benefits is calculated for each plan as the estimated present value of future benefits that eligible employees have earned in return for their service up to the reporting date using the projected benefit method. The discount rate used is based on the yield, as at the reporting date, of high quality corporate debt securities that have approximately the same term as the obligations and that are denominated in the same currency in which the benefits are expected to be paid.

To determine the Company's net defined benefit asset or liability, the fair value of plan assets is deducted from the defined benefit obligations. When this calculation results in a surplus, the asset that can be recognized is limited to the present value of future economic benefit available in the form of future refunds from the plan or reductions in future contributions to the plan (the asset limit). Defined benefit assets are included in other assets and defined benefit liabilities are included in other liabilities.

Changes in the net defined benefit asset or liability due to re-measurement of pension and retiree welfare plans are recorded in OCI in the period in which they occur and are not reclassified to income in subsequent periods. They consist of actuarial gains and losses, the impact of the asset limit, if any, and the return on plan assets, excluding amounts included in net interest income or expense. Changes in the net defined benefit asset or liability due to re-measurement of disability welfare plans are recorded in income in the period in which they occur.

The cost of defined benefit pension plans is recognized over the employee's years of service to retirement while the cost of retiree welfare plans is recognized over the employee's years of service to their date of full eligibility. The net benefit cost for the year is recorded in income and is calculated as the sum of the service cost in respect of the fiscal year, the net interest income or expense and any applicable administration expenses, plus past service costs or credits resulting from plan amendments or curtailments. The net interest income or expense is determined by applying the discount rate to the net defined benefit asset or liability. The current year cost of disability welfare plans is the year-over-year change in the defined benefit obligation, including any actuarial gains or losses.

The cost of defined contribution plans is the contribution provided by the Company and is recorded in income in the periods during which services are rendered by employees.

(p) Derivative and hedging instruments

The Company uses derivative financial instruments ("derivatives") including swaps, forward and futures agreements, and options to manage current and anticipated exposures to changes in interest rates, foreign exchange rates, commodity prices and equity market prices, and to replicate permissible investments. Derivatives embedded in other financial instruments are separately recorded as derivatives when their economic characteristics and risks are not closely related to those of the host instrument, the terms of the embedded derivative are the same as those of a standalone derivative and the host instrument itself is not recorded at FVTPL. Derivatives are recorded at fair value. Derivatives with unrealized gains are reported as derivative assets and derivatives with unrealized losses are reported as derivative liabilities.

A determination is made for each derivative as to whether to apply hedge accounting. Where hedge accounting is not applied, changes in the fair value of derivatives are recorded in investment income. Refer to note 3(c).

Where the Company has elected to apply hedge accounting, a hedging relationship is designated and documented at inception. Hedge effectiveness is evaluated at inception and throughout the term of the hedge. Hedge accounting is only applied when the Company expects that the hedging relationship will be highly effective in achieving offsetting changes in fair value or changes in cash flows attributable to the risk being hedged. The assessment of hedge effectiveness is performed at the end of each reporting period both prospectively and retrospectively. When it is determined that a hedging relationship is no longer effective, or the hedging instrument or the hedged item has been sold or terminated, the Company discontinues hedge accounting prospectively. In such cases, if the derivatives are not sold or terminated, any subsequent changes in fair value of the derivatives are recognized in investment income.

For derivatives that are designated as hedging instruments, changes in fair value are recognized according to the nature of the risks being hedged, as discussed below.

In a fair value hedging relationship, changes in fair value of the hedging instruments are recorded in investment income, offsetting changes in fair value of the hedged items, which would otherwise not be carried at fair value. Hedge ineffectiveness is recognized in investment income and arises from differences between changes in the fair values of hedging instruments and hedged items. When hedge accounting is discontinued, the carrying value of the hedged item is no longer adjusted and the cumulative fair value adjustments are amortized to investment income over the remaining term of the hedged item unless the hedged item is sold, at which time the balance is recognized immediately in investment income.

In a cash flow hedging relationship, the effective portion of the change in the fair value of the hedging instrument is recorded in OCI while the ineffective portion is recognized in investment income. Gains and losses in accumulated other comprehensive income (AOCI) are recognized in income during the same periods as the variability in the hedged cash flows or the hedged forecasted transactions are recognized in income. The reclassifications from AOCI are made to investment income, except for total return swaps that hedge restricted share units, which are reclassified to general expenses.

Gains and losses on cash flow hedges in AOCI are reclassified immediately to investment income when the hedged item is sold or the forecasted transaction is no longer expected to occur. When a hedge is discontinued, but the hedged forecasted transaction remains highly probable to occur, the amounts in AOCI are reclassified to investment income in the periods during which variability in the cash flows hedged or the hedged forecasted transaction is recognized in income.

In a net investment in foreign operations hedging relationship, gains and losses relating to the effective portion of the hedge are recorded in OCI. Gains and losses in AOCI are recognized in income during the periods when gains or losses on the underlying hedged net investment in foreign operations are recognized in income.

(q) Premium income and related expenses

Gross premiums for all types of insurance contracts, and contracts with limited mortality or morbidity risk, are generally recognized as revenue when due. Premiums are reported gross of reinsurance ceded (refer to note 7).

(r) Revenue from service contracts

The Company recognizes revenue from service contracts in accordance with IFRS 15. The Company's service contracts generally impose single performance obligations, each consisting of a series of similar related services for each customer. Revenue is recorded as performance obligations are satisfied over time because the customers simultaneously receive and consume the benefits of the services rendered, measured using an output method. Revenue for variable consideration is recognized to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty is subsequently resolved. Refer to Note 14.

Note 2 Accounting and Reporting Changes

(a) Changes in accounting policy

(I) IFRS 15 "Revenue from Contracts with Customers"

Effective January 1, 2018, the Company adopted IFRS 15 "Revenue from Contracts with Customers" which was issued in May 2014, and replaces IAS 11 "Construction Contracts," IAS 18 "Revenue" and several interpretations. Amendments to IFRS 15 were issued in April 2016. IFRS 15 clarifies revenue recognition principles, provides a robust framework for recognizing revenue and cash flows arising from contracts with customers and enhances qualitative and quantitative disclosure requirements. IFRS 15 does not apply to insurance contracts, financial instruments and lease contracts. The Company adopted IFRS 15 using the modified retrospective method with no restatement of comparative information.

The Company's service arrangements are generally satisfied over time, with revenue measured and collected from customers within a short term, as services are rendered.

Adoption of IFRS 15 did not have a significant impact or result in transitional adjustments on the Company's Consolidated Financial Statements.

(II) IFRS 9 "Financial Instruments" and Amendments to IFRS 4 "Insurance Contracts"

Effective January 1, 2018, the Company adopted the amendments to IFRS 4 "Insurance Contracts" issued in September 2016. IFRS 9 "Financial Instruments" replaced IAS 39 "Financial Instruments: Recognition and Measurement" and resulted in revisions to classification and measurement, impairment of financial assets, and hedge accounting.

To address concerns about differing effective dates of IFRS 9 "Financial Instruments" which is effective on January 1, 2018 and IFRS 17 "Insurance Contracts" which is effective on January 1, 2021, amendments to IFRS 4 "Insurance Contracts" provides companies whose activities are predominantly related to insurance an optional temporary exemption from applying IFRS 9 until January 1, 2021. Adoption of these amendments enabled the Company to defer the adoption of IFRS 9 and continue to apply IAS 39 until January 1, 2021.

In November 2018, the IASB tentatively decided to defer the fixed expiry date for the temporary exemption in IFRS 4 from applying IFRS 9 by one year for companies whose activities are predominantly related to insurance. MFC's activities are predominantly related to insurance. The proposed deferral is subject to IASB public consultation in 2019 which is expected to result in an exposure draft followed by a public comment period. The Company will continue to monitor IASB's future developments related to the deferral.

In order to compare with entities applying IFRS 9, the amendments to IFRS 4 require deferring entities to disclose additional information regarding the contractual cashflows characteristics and credit exposure of their financial statements. Deferring entities must disclose which financial assets have contractual terms that are solely payments of principal and interest on principal outstanding ("SPPI"). Adoption of these disclosure requirements did not have a significant impact on the Company's Consolidated Financial Statements. Refer to note 3(a).

(III) Amendments to IFRS 2 “Share-Based Payment”

Effective January 1, 2018, the Company adopted amendments to IFRS 2 “Share-Based Payment”, issued in June 2016. These amendments were applied prospectively. The amendments clarify the effects of vesting and non-vesting conditions on the measurement of cash-settled share-based payments; provide guidance on the classification of share-based payment transactions with net settlement features for withholding tax obligations; and clarify accounting for modification to the terms and conditions of a share-based payment that changes the classification of the transaction from cash-settled to equity-settled. Adoption of these amendments did not have a significant impact on the Company’s Consolidated Financial Statements.

(IV) IFRIC 22 “Foreign Currency Transactions and Advance Consideration”

Effective January 1, 2018, the Company adopted IFRIC 22 “Foreign Currency Transactions and Advance Consideration”, issued in December 2016. IFRIC 22 was applied prospectively. IFRIC 22 addresses which foreign exchange rate to use to measure a foreign currency transaction when advance payments are made or received and non-monetary assets or liabilities are recognized prior to recognition of the underlying transaction. IFRIC 22 does not relate to goods or services accounted for at fair value or at the fair value of consideration paid or received at a date other than the date of initial recognition of the non-monetary asset or liability, or to income taxes, insurance contracts or reinsurance contracts. The foreign exchange rate on the day of the advance payment is used to measure the foreign currency transaction. If multiple advance payments are made or received, each payment is measured separately. Adoption of IFRIC 22 did not have a significant impact on the Company’s Consolidated Financial Statements.

(V) Annual improvements to IFRS Standards 2014-2016 Cycle

Effective January 1, 2018, the Company adopted amendments issued within the Annual Improvements to IFRS Standards 2014-2016 Cycle, as issued by the IASB in December 2016. Minor amendments as part of this cycle were effective in 2017 and were adopted by the Company in that year, with remaining amendments being effective January 1, 2018. The amendments were applied retrospectively. Adoption of these amendments did not have a significant impact on the Company’s Consolidated Financial Statements.

(b) Future accounting and reporting changes

(I) IFRS 9 “Financial Instruments”

IFRS 9 “Financial Instruments” was issued in November 2009 and amended in October 2010, November 2013 and July 2014, and is effective for years beginning on or after January 1, 2018, to be applied retrospectively, or on a modified retrospective basis. Additionally, the IASB issued amendments in October 2017 that are effective for annual periods beginning on or after January 1, 2019. The standard is intended to replace IAS 39 “Financial Instruments: Recognition and Measurement”.

The project has been divided into three phases: classification and measurement, impairment of financial assets, and hedge accounting. IFRS 9’s current classification and measurement methodology provides that financial assets are measured at either amortized cost or fair value on the basis of the entity’s business model for managing the financial assets and the contractual cash flow characteristics of the financial assets. The classification and measurement for financial liabilities remains generally unchanged; however, for a financial liability designated as at fair value through profit or loss, revisions have been made in the accounting for changes in fair value attributable to changes in the credit risk of that liability. Gains or losses caused by changes in an entity’s own credit risk on such liabilities are no longer recognized in profit or loss but instead are reflected in OCI.

Revisions to hedge accounting were issued in November 2013 as part of the overall IFRS 9 project. The amendment introduces a new hedge accounting model, together with corresponding disclosures about risk management activity for those applying hedge accounting. The new model represents a substantial overhaul of hedge accounting that will enable entities to better reflect their risk management activities in their financial statements.

Revisions issued in July 2014 replace the existing incurred loss model used for measuring the allowance for credit losses with an expected loss model. Changes were also made to the existing classification and measurement model designed primarily to address specific application issues raised by early adopters of the standard. They also address the income statement accounting mismatches and short-term volatility issues which have been identified as a result of the insurance contracts project.

The Company elected to defer IFRS 9 until January 1, 2021 as allowed under the amendments to IFRS 4 “Insurance Contracts” outlined above. The Company is assessing the impact of this standard.

(II) IFRS 16 “Leases”

IFRS 16 “Leases” was issued in January 2016 and is effective for years beginning on or after January 1, 2019. It will replace IAS 17 “Leases” and IFRIC 4 “Determining whether an arrangement contains a lease”. The Company will adopt IFRS 16 effective January 1, 2019, on a modified retrospective basis with no restatement of comparative information.

IFRS 16 sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract. The standard brings most leases on-balance sheet for lessees under a single model, eliminating the previous classifications of operating and finance leases. Exemptions to this treatment are for lease contracts with low value assets or leases with duration of less than one year. The on-balance sheet treatment will result in a grossing up of the balance sheet due to right-of-use assets being recognized with offsetting liabilities. Lessor accounting will remain largely unchanged with previous classifications of operating and finance leases being maintained.

Adoption of IFRS 16 is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(III) IFRS Interpretation Committee (“IFRIC”) Interpretation 23 “Uncertainty over Income Tax Treatments”

IFRIC 23 “Uncertainty over Income Tax Treatments” was issued in June 2017 and is effective for years beginning on or after January 1, 2019, to be applied retrospectively. IFRIC 23 provides guidance on applying the recognition and measurement requirements in IAS 12 when there is uncertainty over income tax treatments including whether uncertain tax treatments should be considered together or separately based on which approach better predicts resolution of the uncertainty. Adoption of IFRIC 23 is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(IV) Amendments to IAS 28 “Investments in Associates and Joint Ventures”

Amendments to IAS 28 “Investments in Associates and Joint Ventures” were issued in October 2017 and are effective for annual periods beginning on or after January 1, 2019, to be applied retrospectively. The amendments clarify that an entity applies IFRS 9 “Financial Instruments” to financial interests in an associate or joint venture to which the equity method is not applied. IAS 39 will be applied to these interests until IFRS 9 is adopted. Adoption of these amendments is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(V) Annual Improvements 2015–2017 Cycle

Annual Improvements 2015 – 2017 Cycle was issued in December 2017 and is effective for years beginning on or after January 1, 2019. The IASB issued three minor amendments to different standards as part of the Annual Improvements process, with the amendments to be applied prospectively. Adoption of these amendments is not expected to have significant impact on the Company’s Consolidated Financial Statements.

(VI) Amendments to IAS 19 “Employee Benefits”

Amendments to IAS 19 “Employee Benefits” were issued in February 2018 and are effective for annual periods beginning on or after January 1, 2019, with earlier application permitted. The amendments address the accounting for a plan amendment, curtailment or settlement that occurs within a reporting period. Updated actuarial assumptions must be used to determine current service cost and net interest for the remainder of the reporting period after such an event. The amendments also address how the accounting for asset ceilings are affected by such an event. Adoption of these amendments is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(VII) Amendments to IFRS 3 “Business Combinations”

Amendments to IFRS 3 “Business Combinations” were issued in October 2018 and are effective for business combinations occurring on or after January 1, 2020, with earlier application permitted. The amendments revise the definition of a business and provide a simplified assessment of whether an acquired set of activities and assets qualifies as a business. Application of the amendments are expected to result in fewer acquisitions qualifying as business combinations. Adoption of these amendments is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(VIII) Amendments to IAS 1 “Presentation of Financial Statements” and IAS 8 “Accounting Policies, Changes in Accounting Estimates and Errors”

Amendments to IAS 1 “Presentation of Financial Statements” and IAS 8 “Accounting Policies, Changes in Accounting Estimates and Errors” were issued in October 2018. The amendments are effective for annual periods beginning on or after January 1, 2020 and are to be applied prospectively. The amendments update the definition of material. Adoption of these amendments is not expected to have a significant impact on the Company’s Consolidated Financial Statements.

(IX) IFRS 17 “Insurance Contracts”

IFRS 17 was issued in May 2017 and is effective for years beginning on January 1, 2021, to be applied retrospectively. If full retrospective application to a group of contracts is impractical, the modified retrospective or fair value methods may be used. The standard will replace IFRS 4 “Insurance Contracts” and will materially change the recognition and measurement of insurance contracts and the corresponding presentation and disclosures in the Company’s Financial Statements.

In November 2018, the IASB tentatively decided to defer the effective date of IFRS 17 by one year. The proposed deferral is subject to IASB public consultation in 2019 which is expected to result in an exposure draft followed by a public comment period. The Company will continue to monitor IASB’s future developments related to IFRS 17.

IFRS 17 requires entities to measure insurance contract liabilities on the balance sheet as the total of (a) the fulfillment cash flows – the current estimates of amounts that the Company expects to collect from premiums and pay out for claims, benefits and expenses, including an adjustment for the timing and risk for those amounts; and (b) the contractual service margin – the future profit for providing insurance coverage.

The principles underlying IFRS 17 differ from the CALM as permitted by IFRS 4. While there are many differences, the following outlines two of the key differences:

- Under IFRS 17 the discount rate used to estimate the present value of insurance liabilities is based on the characteristics of the liability, whereas under CALM, the Company uses the rates of returns for current and projected assets supporting policy liabilities to value the liabilities. The difference in the discount rate approach also impacts the timing of investment-related experience earnings emergence. Under CALM, investment-related experience includes investment experience and the impact of investing activities. The impact of investing activities is directly related to the CALM methodology. Under IFRS 17 the impact of investing activities will emerge over the life of the new asset.

- Under IFRS 17 new business gains are recorded on the Consolidated Statements of Financial Position and amortized into income as services are provided. Under CALM new business gains (and losses) are recognized in income immediately.

The Company is assessing the implications of this standard and expects that it will have a significant impact on the Company's Consolidated Financial Statements. In addition, in certain jurisdictions, including Canada, it could have a material effect on tax and regulatory capital positions and other financial metrics that are dependent upon IFRS accounting values.

Note 3 Invested Assets and Investment Income

(a) Carrying values and fair values of invested assets

As at December 31, 2018	FVTPL ⁽¹⁾	AFS ⁽²⁾	Other ⁽³⁾	Total carrying value ⁽⁴⁾	Total fair value ⁽⁵⁾
Cash and short-term securities ⁽⁶⁾	\$ 1,080	\$ 10,163	\$ 4,972	\$ 16,215	\$ 16,215
Debt securities ⁽⁷⁾					
Canadian government and agency	16,445	7,342	–	23,787	23,787
U.S. government and agency	11,934	13,990	–	25,924	25,924
Other government and agency	16,159	4,101	–	20,260	20,260
Corporate	107,425	5,245	–	112,670	112,670
Mortgage/asset-backed securities	2,774	179	–	2,953	2,953
Public equities	16,721	2,458	–	19,179	19,179
Mortgages	–	–	48,363	48,363	48,628
Private placements	–	–	35,754	35,754	36,103
Policy loans	–	–	6,446	6,446	6,446
Loans to Bank clients	–	–	1,793	1,793	1,797
Real estate					
Own use property ⁽⁸⁾	–	–	2,016	2,016	3,179
Investment property	–	–	10,761	10,761	10,761
Other invested assets					
Alternative long-duration assets ^{(9),(10)}	14,720	101	8,617	23,438	24,211
Various other ⁽¹¹⁾	151	–	3,954	4,105	4,104
Total invested assets	\$ 187,409	\$ 43,579	\$ 122,676	\$ 353,664	\$ 356,217

As at December 31, 2017	FVTPL ⁽¹⁾	AFS ⁽²⁾	Other ⁽³⁾	Total carrying value	Total fair value ⁽⁵⁾
Cash and short-term securities ⁽⁶⁾	\$ 439	\$ 11,429	\$ 4,097	\$ 15,965	\$ 15,965
Debt securities ⁽⁷⁾					
Canadian government and agency	17,886	4,892	–	22,778	22,778
U.S. government and agency	12,497	13,472	–	25,969	25,969
Other government and agency	16,838	2,988	–	19,826	19,826
Corporate	96,785	5,366	–	102,151	102,151
Mortgage/asset-backed securities	3,018	258	–	3,276	3,276
Public equities	18,473	3,072	–	21,545	21,545
Mortgages	–	–	44,742	44,742	46,065
Private placements	–	–	32,132	32,132	34,581
Policy loans	–	–	5,808	5,808	5,808
Loans to Bank clients	–	–	1,737	1,737	1,742
Real estate					
Own use property ⁽⁸⁾	–	–	1,281	1,281	2,448
Investment property	–	–	12,529	12,529	12,529
Other invested assets					
Alternative long-duration assets ^{(9),(10)}	12,018	88	8,624	20,730	21,053
Various other ⁽¹¹⁾	142	–	3,611	3,753	3,752
Total invested assets	\$ 178,096	\$ 41,565	\$ 114,561	\$ 334,222	\$ 339,488

⁽¹⁾ FVTPL classification was elected for securities backing insurance contract liabilities to substantially reduce any accounting mismatch arising from changes in the fair value of these assets and changes in the value of the related insurance contract liabilities. If this election had not been made and instead the AFS classification was selected, there would be an accounting mismatch because changes in insurance contract liabilities are recognized in net income rather than in OCI.

⁽²⁾ Securities that are designated as AFS are not actively traded by the Company but sales do occur as circumstances warrant. Such sales result in a reclassification of any accumulated unrealized gain (loss) in AOCI to net income as a realized gain (loss).

⁽³⁾ Primarily includes assets classified as loans and carried at amortized cost, own use properties, investment properties, equity method accounted investments, oil and gas investments, and leveraged leases. Refer to note 1(e) for further details regarding accounting policy.

⁽⁴⁾ Fixed income invested assets presented above include debt securities, mortgages, private placements and approximately \$600 other invested assets, which primarily have contractual cash flows that qualify as SPPI. Fixed income invested assets which do not have SPPI qualifying cash flows as at December 31, 2018 include debt securities, private placements and other invested assets with fair values of \$105, \$230 and \$465, respectively. The change in the fair value of these invested assets during the year amounts to \$21.

⁽⁵⁾ The methodologies used in determining fair values of invested assets are described in note 1(c) and note 3(g).

⁽⁶⁾ Includes short-term securities with maturities of less than one year at acquisition amounting to \$2,530 (2017 – \$2,737), cash equivalents with maturities of less than 90 days at acquisition amounting to \$8,713 (2017 – \$9,131) and cash of \$4,972 (2017 – \$4,097).

⁽⁷⁾ Debt securities include securities which were acquired with maturities of less than one year and less than 90 days of \$870 and \$40, respectively (2017 – \$1,768 and \$161, respectively).

⁽⁸⁾ Includes accumulated depreciation of \$391 (2017 – \$389).

⁽⁹⁾ Alternative long-duration assets (“ALDA”) include investments in private equity of \$6,769, power and infrastructure of \$7,970, oil and gas of \$3,416, timber and agriculture of \$4,493 and various other invested assets of \$791 (2017 – \$4,959, \$7,355, \$2,813, \$5,033 and \$570, respectively). Included in power and infrastructure are a group of investments in hydro-electric power of \$426 for which the Company has an approved plan of sale. Sale of these investments is expected to be completed within one year. This disposal group is classified as held for sale and measured at the lower of carrying amount and fair value less costs to sell.

⁽¹⁰⁾ During 2018, the Company sold the following invested assets to related parties: \$1,422 of power and infrastructure ALDA to the John Hancock Infrastructure Master Fund L.P. in the U.S. an associate of the Company which is a structured entity based on partnership voting rights, the Company provides management services to the fund and owns less than 1% of the ownership interest; \$510 (2017 – \$395) of U.S. commercial real estate to the Manulife US Real Estate Investment Trust in Singapore, an associate of the Company which is a structured entity based on unitholder voting rights, the Company provides management services to the trust and owns approximately 8.5% (2017 – 9.5%) of its units; and \$1,314 of U.S. commercial real estate to three newly established joint ventures which are structured entities based on voting rights. During 2017, \$619 of U.S. commercial real estate was sold to the Hancock US Real Estate Fund, L.P., an associate of the Company which is a structured entity based on partnership voting rights. The Company provides management services to the fund and owns approximately 11.7% of its partnership interests.

⁽¹¹⁾ Includes \$3,575 (2017 – \$3,273) of leveraged leases. Refer to note 1(e) regarding accounting policy.

(b) Equity method accounted invested assets

Other invested assets include investments in associates and joint ventures which are accounted for using the equity method of accounting as presented in the following table.

As at December 31,	2018		2017	
	Carrying value	% of total	Carrying value	% of total
Leveraged leases	\$ 3,575	51	\$ 3,273	56
Timber and agriculture	599	9	451	8
Real estate	725	11	498	9
Other	1,959	29	1,535	27
Total	\$ 6,858	100	\$ 5,757	100

The Company’s share of profit and dividends from these investments for the year ended December 31, 2018 were \$369 and \$13, respectively (2017 – \$291 and \$14, respectively).

(c) Investment income

For the year ended December 31, 2018	FVTPL	AFS	Other ⁽¹⁾	Total
Cash and short-term securities				
Interest income	\$ 18	\$ 250	\$ –	\$ 268
Gains (losses) ⁽²⁾	(74)	62	–	(12)
Debt securities				
Interest income	5,432	646	–	6,078
Gains (losses) ⁽²⁾	(5,993)	(310)	–	(6,303)
Recovery (impairment loss), net	18	–	–	18
Public equities				
Dividend income	484	72	–	556
Gains (losses) ⁽²⁾	(1,596)	330	–	(1,266)
Impairment loss	–	(43)	–	(43)
Mortgages				
Interest income	–	–	1,824	1,824
Gains (losses) ⁽²⁾	–	–	56	56
Provision, net	–	–	(8)	(8)
Private placements				
Interest income	–	–	1,729	1,729
Gains (losses) ⁽²⁾	–	–	(83)	(83)
Impairment loss, net	–	–	(10)	(10)
Policy loans	–	–	371	371
Loans to Bank clients				
Interest income	–	–	81	81
Provision, net	–	–	(1)	(1)
Real estate				
Rental income, net of depreciation ⁽³⁾	–	–	515	515
Gains (losses) ⁽²⁾	–	–	445	445
Impairment loss	–	–	–	–
Derivatives				
Interest income, net	689	–	(33)	656
Gains (losses) ⁽²⁾	(2,251)	–	27	(2,224)
Other invested assets				
Interest income	–	–	74	74
Oil and gas, timber, agriculture and other income	–	–	1,758	1,758
Gains (losses) ⁽²⁾	283	–	(110)	173
Impairment loss, net	(2)	(4)	(114)	(120)
Total investment income	\$ (2,992)	\$ 1,003	\$ 6,521	\$ 4,532
Investment income				
Interest income	\$ 6,139	\$ 896	\$ 4,046	\$ 11,081
Dividend, rental and other income	484	72	2,273	2,829
Impairments, provisions and recoveries, net	16	(47)	(133)	(164)
Other	(271)	58	27	(186)
	6,368	979	6,213	13,560
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on macro equity hedges				
Debt securities	(6,012)	18	–	(5,994)
Public equities	(1,454)	10	–	(1,444)
Mortgages	–	–	55	55
Private placements	–	–	(83)	(83)
Real estate	–	–	449	449
Other invested assets	357	(4)	(140)	213
Derivatives, including macro equity hedging program	(2,251)	–	27	(2,224)
	(9,360)	24	308	(9,028)
Total investment income	\$ (2,992)	\$ 1,003	\$ 6,521	\$ 4,532

For the year ended December 31, 2017	FVTPL	AFS	Other ⁽¹⁾	Total
Cash and short-term securities				
Interest income	\$ 7	\$ 153	\$ –	\$ 160
Gains (losses) ⁽²⁾	22	(47)	–	(25)
Debt securities				
Interest income	5,102	577	–	5,679
Gains (losses) ⁽²⁾	3,690	(205)	–	3,485
Recovery (impairment loss), net	16	(1)	–	15
Public equities				
Dividend income	524	79	–	603
Gains (losses) ⁽²⁾	2,372	226	–	2,598
Impairment loss	–	(14)	–	(14)
Mortgages				
Interest income	–	–	1,685	1,685
Gains (losses) ⁽²⁾	–	–	69	69
Provision, net	–	–	(32)	(32)
Private placements				
Interest income	–	–	1,553	1,553
Gains (losses) ⁽²⁾	–	–	43	43
Impairment loss, net	–	–	10	10
Policy loans	–	–	365	365
Loans to Bank clients				
Interest income	–	–	68	68
Real estate				
Rental income, net of depreciation ⁽³⁾	–	–	517	517
Gains (losses) ⁽²⁾	–	–	341	341
Impairment loss	–	–	(4)	(4)
Derivatives				
Interest income, net	809	–	84	893
Gains (losses) ⁽²⁾	(1,029)	–	84	(945)
Other invested assets				
Interest income	–	–	174	174
Oil and gas, timber, agriculture and other income	–	–	1,690	1,690
Gains (losses) ⁽²⁾	441	(7)	50	484
Impairment loss, net	–	–	(45)	(45)
Total investment income	\$11,954	\$ 761	\$6,652	\$19,367
Investment income				
Interest income	\$ 5,918	\$ 730	\$3,929	\$10,577
Dividend, rental and other income	524	79	2,207	2,810
Impairments, provisions and recoveries, net	16	(15)	(71)	(70)
Other	460	(51)	(77)	332
	6,918	743	5,988	13,649
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on macro equity hedges				
Debt securities	3,694	(8)	–	3,686
Public equities	2,200	35	–	2,235
Mortgages	–	–	69	69
Private placements	–	–	40	40
Real estate	–	–	350	350
Other invested assets	329	(9)	121	441
Derivatives, including macro equity hedging program	(1,187)	–	84	(1,103)
	5,036	18	664	5,718
Total investment income	\$11,954	\$ 761	\$6,652	\$19,367

⁽¹⁾ Primarily includes investment income on loans carried at amortized cost, own use properties, investment properties, derivative and hedging instruments in cash flow hedging relationships, equity method accounted investments, oil and gas investments, and leveraged leases.

⁽²⁾ Includes net realized and unrealized gains (losses) for financial instruments at FVTPL, real estate investment properties, and other invested assets measured at fair value. Also includes net realized gains (losses) for financial instruments at AFS and other invested assets carried at amortized cost.

⁽³⁾ Rental income from investment properties is net of direct operating expenses.

(d) Investment expenses

The following table presents the Company's total investment expenses.

For the years ended December 31,	2018	2017
Related to invested assets	\$ 638	\$ 625
Related to segregated, mutual and other funds	1,070	1,048
Total investment expenses	\$ 1,708	\$ 1,673

(e) Investment properties

The following table presents the rental income and direct operating expenses of investment properties.

For the years ended December 31,	2018	2017
Rental income from investment properties	\$ 1,013	\$ 1,120
Direct operating expenses of rental investment properties	(582)	(694)
Total	\$ 431	\$ 426

(f) Mortgage securitization

The Company securitizes certain insured and uninsured fixed and variable rate residential mortgages and Home Equity Lines of Credit ("HELOC") through creation of mortgage-backed securities under the Canadian Mortgage Bond Program ("CMB"), and the HELOC securitization program.

Benefits received from the securitization include interest spread between the asset and associated liability. There are no expected credit losses on securitized mortgages under the Canada Mortgage and Housing Corporation ("CMHC") sponsored CMB and the Platinum Canadian Mortgage Trust ("PCMT") HELOC securitization programs as they are insured by CMHC and other third-party insurance programs against borrowers' default. Mortgages securitized in the Platinum Canadian Mortgage Trust II ("PCMT II") program are uninsured.

Cash flows received from the underlying securitized assets/mortgages are used to settle the related secured borrowing liability. For CMB transactions, receipts of principal are deposited into a trust account for settlement of the liability at time of maturity. These transferred assets and related cash flows cannot be transferred or used for other purposes. For the HELOC transactions, investors are entitled to periodic interest payments, and the remaining cash receipts of principal are allocated to the Company (the "Seller") during the revolving period of the deal and are accumulated for settlement during an accumulation period or repaid to the investor monthly during a reduction period, based on the terms of the note.

Securitized assets and secured borrowing liabilities

As at December 31, 2018

Securitization program	Securitized assets			Secured borrowing liabilities ⁽²⁾
	Securitized mortgages	Restricted cash and short-term securities	Total	
HELOC securitization ⁽¹⁾	\$ 2,285	\$ 8	\$ 2,293	\$ 2,250
CMB securitization	1,525	–	1,525	1,524
Total	\$ 3,810	\$ 8	\$ 3,818	\$ 3,774

As at December 31, 2017

Securitization program	Securitized assets			Secured borrowing liabilities ⁽²⁾
	Securitized mortgages	Restricted cash and short-term securities	Total	
HELOC securitization ⁽¹⁾	\$ 2,024	\$ 8	\$ 2,032	\$ 2,000
CMB securitization	1,480	–	1,480	1,523
Total	\$ 3,504	\$ 8	\$ 3,512	\$ 3,523

⁽¹⁾ Manulife Bank, a MFC subsidiary, securitizes a portion of its HELOC receivables through Platinum Canadian Mortgage Trust ("PCMT"), and Platinum Canadian Mortgage Trust II ("PCMT II"). PCMT funds the purchase of the co-ownership interests from Manulife Bank by issuing term notes collateralized by an underlying pool of CMHC insured HELOCs to institutional investors. PCMT II funds the purchase of the co-ownership interests from Manulife Bank by issuing term notes collateralized by an underlying pool of uninsured HELOCs to institutional investors. The restricted cash balance for the HELOC securitization reflects a cash reserve fund established in relation to the transactions. The reserve will be drawn upon only in the event of insufficient cash flows from the underlying HELOCs to satisfy the secured borrowing liability.

⁽²⁾ Secured borrowing liabilities primarily comprise of Series 2011-1 notes with a floating rate which are expected to mature on December 15, 2021, and the Series 2016-1 notes with a floating rate which are expected to mature on May 15, 2022. Manulife Bank also securitizes insured amortizing mortgages under the National Housing Act Mortgage-Backed Securities ("NHA MBS") program sponsored by CMHC. Manulife Bank participates in CMB programs by selling NHA MBS securities to Canada Housing Trust ("CHT"), as a source of fixed rate funding.

As at December 31, 2018, the fair value of the securitized assets was \$3,843 (2017 – \$3,533) and the associated liabilities was \$3,756 (2017 – \$3,503).

(g) Fair value measurement

The following table presents the fair values of invested assets and segregated funds net assets measured at fair value categorized by the fair value hierarchy.

As at December 31, 2018	Total fair value	Level 1	Level 2	Level 3
Cash and short-term securities				
FVTPL	\$ 1,080	\$ –	\$ 1,080	\$ –
AFS	10,163	–	10,163	–
Other	4,972	4,972	–	–
Debt securities				
FVTPL				
Canadian government and agency	16,445	–	16,445	–
U.S. government and agency	11,934	–	11,934	–
Other government and agency	16,159	–	15,979	180
Corporate	107,425	–	106,641	784
Residential mortgage/asset-backed securities	13	–	6	7
Commercial mortgage/asset-backed securities	1,344	–	1,344	–
Other securitized assets	1,417	–	1,417	–
AFS				
Canadian government and agency	7,342	–	7,342	–
U.S. government and agency	13,990	–	13,990	–
Other government and agency	4,101	–	4,064	37
Corporate	5,245	–	5,125	120
Residential mortgage/asset-backed securities	2	–	–	2
Commercial mortgage/asset-backed securities	128	–	128	–
Other securitized assets	49	–	49	–
Public equities				
FVTPL	16,721	16,718	–	3
AFS	2,458	2,456	2	–
Real estate – investment property⁽¹⁾	10,761	–	–	10,761
Other invested assets⁽²⁾	17,562	–	–	17,562
Segregated funds net assets⁽³⁾	313,209	276,178	32,584	4,447
Total	\$ 562,520	\$ 300,324	\$ 228,293	\$ 33,903

As at December 31, 2017	Total fair value	Level 1	Level 2	Level 3
Cash and short-term securities				
FVTPL	\$ 439	\$ –	\$ 439	\$ –
AFS	11,429	–	11,429	–
Other	4,097	4,097	–	–
Debt securities				
FVTPL				
Canadian government and agency	17,886	–	17,886	–
U.S. government and agency	12,497	–	12,497	–
Other government and agency	16,838	–	16,599	239
Corporate	96,785	2	96,073	710
Residential mortgage/asset-backed securities	8	–	7	1
Commercial mortgage/asset-backed securities	1,099	–	1,099	–
Other securitized assets	1,911	–	1,886	25
AFS				
Canadian government and agency	4,892	–	4,892	–
U.S. government and agency	13,472	–	13,472	–
Other government and agency	2,988	–	2,941	47
Corporate	5,366	–	5,278	88
Residential mortgage/asset-backed securities	37	–	37	–
Commercial mortgage/asset-backed securities	138	–	138	–
Other securitized assets	83	–	82	1
Public equities				
FVTPL	18,473	18,470	–	3
AFS	3,072	3,069	3	–
Real estate – investment property⁽¹⁾	12,529	–	–	12,529
Other invested assets⁽²⁾	16,203	–	–	16,203
Segregated funds net assets⁽³⁾	324,307	286,490	33,562	4,255
Total	\$ 564,549	\$ 312,128	\$ 218,320	\$ 34,101

⁽¹⁾ For investment properties, the significant unobservable inputs are capitalization rates (ranging from 2.75% to 8.75% during the year and ranging from 3.50% to 9.00% during 2017) and terminal capitalization rates (ranging from 3.65% to 9.25% during the year and ranging from 4.0% to 9.25% during 2017). Holding other factors constant, a lower capitalization or terminal capitalization rate will tend to increase the fair value of an investment property. Changes in fair value based on variations in unobservable inputs generally cannot be extrapolated because the relationship between the directional changes of each input is not usually linear.

⁽²⁾ Other invested assets measured at fair value are held primarily in power and infrastructure and timber sectors. The significant inputs used in the valuation of the Company's power and infrastructure investments are primarily future distributable cash flows, terminal values and discount rates. Holding other factors constant, an increase to future distributable cash flows or terminal values would tend to increase the fair value of a power and infrastructure investment, while an increase in the discount rate would have the opposite effect. Discount rates during the year ranged from 8.95% to 16.5% (2017 – ranged from 9.20% to 16.5%). Disclosure of distributable cash flow and terminal value ranges are not meaningful given the disparity in estimates by project. The significant inputs used in the valuation of the Company's investments in timberland are timber prices and discount rates. Holding other factors constant, an increase to timber prices would tend to increase the fair value of a timberland investment, while an increase in the discount rates would have the opposite effect. Discount rates during the year ranged from 5.0% to 7.0% (2017 – ranged from 5.0% to 7.5%). A range of prices for timber is not meaningful as the market price depends on factors such as property location and proximity to markets and export yards.

⁽³⁾ Segregated funds net assets are measured at fair value. The Company's Level 3 segregated funds assets are predominantly invested in investment properties and timberland properties valued as described above.

Fair value and the fair value hierarchy of invested assets not measured at fair value.

As at December 31, 2018	Carrying value	Fair value	Level 1	Level 2	Level 3
Mortgages ⁽¹⁾	\$ 48,363	\$ 48,628	\$ –	\$ –	\$ 48,628
Private placements ⁽²⁾	35,754	36,103	–	30,325	5,778
Policy loans ⁽³⁾	6,446	6,446	–	6,446	–
Loans to Bank clients ⁽⁴⁾	1,793	1,797	–	1,797	–
Real estate – own use property ⁽⁵⁾	2,016	3,179	–	–	3,179
Other invested assets ⁽⁶⁾	9,981	10,753	121	–	10,632
Total invested assets disclosed at fair value	\$ 104,353	\$ 106,906	\$ 121	\$ 38,568	\$ 68,217

As at December 31, 2017	Carrying value	Fair value	Level 1	Level 2	Level 3
Mortgages ⁽¹⁾	\$ 44,742	\$ 46,065	\$ –	\$ –	\$ 46,065
Private placements ⁽²⁾	32,132	34,581	–	28,514	6,067
Policy loans ⁽³⁾	5,808	5,808	–	5,808	–
Loans to Bank clients ⁽⁴⁾	1,737	1,742	–	1,742	–
Real estate – own use property ⁽⁵⁾	1,281	2,448	–	–	2,448
Other invested assets ⁽⁶⁾	8,280	8,602	88	–	8,514
Total invested assets disclosed at fair value	\$ 93,980	\$ 99,246	\$ 88	\$ 36,064	\$ 63,094

⁽¹⁾ Fair value of commercial mortgages is determined through an internal valuation methodology using both observable and unobservable inputs. Unobservable inputs include credit assumptions and liquidity spread adjustments. Fair value of fixed-rate residential mortgages is determined using the discounted cash flow method. Inputs used for valuation are primarily comprised of prevailing interest rates and prepayment rates, if applicable. Fair value of variable-rate residential mortgages is assumed to be their carrying value.

⁽²⁾ Fair value of private placements is determined through an internal valuation methodology using both observable and unobservable inputs. Unobservable inputs include credit assumptions and liquidity spread adjustments. Private placements are classified within Level 2 unless the liquidity adjustment constitutes a significant price impact, in which case the securities are classified as Level 3.

⁽³⁾ Fair value of policy loans is equal to their unpaid principal balances.

⁽⁴⁾ Fair value of fixed-rate loans to Bank clients is determined using the discounted cash flow method. Inputs used for valuation are primarily comprised of current interest rates. Fair value of variable-rate loans is assumed to be their carrying value.

⁽⁵⁾ Fair value of own use real estate and the fair value hierarchy are determined in accordance with the methodologies described for real estate – investment property in note 1.

⁽⁶⁾ Primarily include leveraged leases, oil and gas properties and equity method accounted other invested assets. Fair value of leveraged leases is disclosed at their carrying values as fair value is not routinely calculated on these investments. Fair value for oil and gas properties is determined using external appraisals based on discounted cash flow methodology. Inputs used in valuation are primarily comprised of forecasted price curves, planned production, as well as capital expenditures, and operating costs. Fair value of equity method accounted other invested assets is determined using a variety of valuation techniques including discounted cash flows and market comparable approaches. Inputs vary based on the specific investment.

Transfers between Level 1 and Level 2

The Company records transfers of assets and liabilities between Level 1 and Level 2 at their fair values as at the end of each reporting period. Assets are transferred out of Level 1 when they are no longer transacted with sufficient frequency and volume in an active market. Conversely, assets are transferred from Level 2 to Level 1 when transaction volume and frequency are indicative of an active market. The Company had \$nil of assets transferred between Level 1 and Level 2 during the years ended December 31, 2018 and 2017.

For segregated funds net assets, the Company had \$nil transfers from Level 1 to Level 2 for the year ended December 31, 2018 (2017 – \$nil). The Company had \$2 transfers from Level 2 to Level 1 for the year ended December 31, 2018 (2017 – \$5).

Invested assets and segregated funds net assets measured at fair value using significant unobservable inputs (Level 3)

The Company classifies fair values of invested assets and segregated funds net assets as Level 3 if there are no observable markets for these assets or, in the absence of active markets, most of the inputs used to determine fair value are based on the Company's own assumptions about market participant assumptions. The Company prioritizes the use of market-based inputs over entity-based assumptions in determining Level 3 fair values. The gains and losses in the tables below include the changes in fair value due to both observable and unobservable factors.

The following tables present a roll forward for invested assets and segregated funds net assets measured at fair value using significant unobservable inputs (Level 3) for the years ended December 31, 2018 and 2017.

For the year ended December 31, 2018	Balance, January 1, 2018	Net realized/ unrealized gains (losses) included in net income ⁽¹⁾	Net realized/ unrealized gains (losses) included in AOCI ⁽²⁾	Purchases	Sales	Settlements	Transfer into Level 3 ⁽³⁾	Transfer out of Level 3 ⁽³⁾	Currency movement	Balance, December 31, 2018	Change in unrealized gains (losses) on assets still held
Debt securities											
FVTPL											
Other government & agency	\$ 239	\$ (2)	\$ –	\$ 27	\$ (85)	\$ (14)	\$ –	\$ –	\$ 15	\$ 180	\$ (3)
Corporate	710	3	–	190	(61)	(18)	–	(93)	53	784	(10)
Residential mortgage/asset- backed securities	1	6	–	–	–	–	–	–	–	7	6
Other securitized assets	25	–	–	31	–	–	–	(56)	–	–	–
	975	7	–	248	(146)	(32)	–	(149)	68	971	(7)
AFS											
Other government & agency	47	–	–	6	(15)	(4)	–	–	3	37	–
Corporate	88	–	–	49	(12)	(4)	–	(7)	6	120	–
Residential mortgage/asset- backed securities	–	–	1	–	–	–	–	–	1	2	–
Other securitized assets	1	–	–	–	–	–	–	(1)	–	–	–
	136	–	1	55	(27)	(8)	–	(8)	10	159	–
Public equities											
FVTPL	3	–	–	–	–	–	–	–	–	3	–
	3	–	–	–	–	–	–	–	–	3	–
Real estate – investment property	12,529	291	–	615	(2,578)	–	–	(706)	610	10,761	244
Other invested assets	16,203	(1,168)	1	3,926	(1,636)	(841)	–	(35)	1,112	17,562	(434)
	28,732	(877)	1	4,541	(4,214)	(841)	–	(741)	1,722	28,323	(190)
Segregated funds net assets	4,255	226	–	155	(367)	1	3	(17)	191	4,447	161
Total	\$ 34,101	\$ (644)	\$ 2	\$ 4,999	\$ (4,754)	\$ (880)	\$ 3	\$ (915)	\$ 1,991	\$ 33,903	\$ (36)

	Balance, January 1, 2017	Net realized/ unrealized gains (losses) included in net income ⁽¹⁾	Net realized/ unrealized gains (losses) included in AOCI ⁽²⁾	Purchases	Sales	Settlements	Transfer into Level 3 ⁽³⁾	Transfer out of Level 3 ⁽³⁾	Currency movement	Balance, December 31, 2017	Change in unrealized gains (losses) on assets still held
For the year ended December 31, 2017											
Debt securities											
FVTPL											
Other government & agency	\$ 272	\$ (3)	\$ –	\$ 26	\$ (58)	\$ (6)	\$ –	\$ –	\$ 8	\$ 239	\$ (3)
Corporate	651	19	–	105	(34)	(29)	24	(21)	(5)	710	10
Residential mortgage/asset-backed securities	2	–	–	–	–	–	–	–	(1)	1	(1)
Commercial mortgage/asset-backed securities	6	–	–	–	(5)	(1)	–	–	–	–	–
Other securitized assets	35	(1)	–	–	–	(7)	–	–	(2)	25	(1)
	966	15	–	131	(97)	(43)	24	(21)	–	975	5
AFS											
Other government & agency	51	(1)	(2)	14	(15)	(2)	1	–	1	47	–
Corporate	74	–	4	22	(10)	(4)	–	–	2	88	–
Residential mortgage/asset-backed securities	1	–	(1)	–	–	–	–	–	–	–	–
Commercial mortgage/asset-backed securities	2	–	–	–	(1)	(1)	–	–	–	–	–
Other securitized assets	2	–	–	–	–	(1)	–	–	–	1	–
	130	(1)	1	36	(26)	(8)	1	–	3	136	–
Public equities											
FVTPL	7	–	–	–	(4)	–	–	–	–	3	–
	7	–	–	–	(4)	–	–	–	–	3	–
Real estate – investment property	12,756	301	–	1,257	(1,267)	–	–	–	(518)	12,529	264
Other invested assets	14,849	395	–	3,022	(435)	(837)	–	–	(791)	16,203	244
	27,605	696	–	4,279	(1,702)	(837)	–	–	(1,309)	28,732	508
Segregated funds net assets	4,574	60	–	261	(248)	(54)	–	(184)	(154)	4,255	45
Total	\$ 33,282	\$ 770	\$ 1	\$ 4,707	\$ (2,077)	\$ (942)	\$ 25	\$ (205)	\$ (1,460)	\$ 34,101	\$ 558

⁽¹⁾ These amounts are included in net investment income on the Consolidated Statements of Income except for the amount related to segregated funds net assets, where the amount is recorded in changes in segregated funds net assets, refer to note 22.

⁽²⁾ These amounts are included in AOCI on the Consolidated Statements of Financial Position.

⁽³⁾ For assets transferred into and out of Level 3, the Company uses fair values of the assets at the beginning of the year.

Transfers into Level 3 primarily result from securities that were impaired during the year or securities where a lack of observable market data (versus the previous period) resulted in reclassifying assets into Level 3. Transfers from Level 3 primarily result from observable market data now being available for the entire term structure of the debt security.

Note 4 Derivative and Hedging Instruments

Derivatives are financial contracts, the value of which is derived from underlying interest rates, foreign exchange rates, other financial instruments, commodity prices or indices. The Company uses derivatives including swaps, forward and futures agreements, and options to manage current and anticipated exposures to changes in interest rates, foreign exchange rates, commodity prices and equity market prices, and to replicate permissible investments.

Swaps are over-the-counter (“OTC”) contractual agreements between the Company and a third party to exchange a series of cash flows based upon rates applied to a notional amount. For interest rate swaps, counterparties generally exchange fixed or floating interest rate payments based on a notional value in a single currency. Cross currency swaps involve the exchange of principal amounts between parties as well as the exchange of interest payments in one currency for the receipt of interest payments in another currency. Total return swaps are contracts that involve the exchange of payments based on changes in the values of a reference asset, including any returns such as interest earned on these assets, in return for amounts based on reference rates specified in the contract.

Forward and futures agreements are contractual obligations to buy or sell a financial instrument, foreign currency or other underlying commodity on a predetermined future date at a specified price. Forward contracts are OTC contracts negotiated between counterparties, whereas futures agreements are contracts with standard amounts and settlement dates that are traded on regulated exchanges.

Options are contractual agreements whereby the holder has the right, but not the obligation, to buy (call option) or sell (put option) a security, exchange rate, interest rate, or other financial instrument at a predetermined price/rate within a specified time.

See variable annuity dynamic hedging strategy in the “Risk Management” section of the Company’s 2018 MD&A for an explanation of the Company’s dynamic hedging strategy for its variable annuity product guarantees.

(a) Fair value of derivatives

The pricing models used to value OTC derivatives are based on market standard valuation methodologies and the inputs to these models are consistent with what a market participant would use when pricing the instruments. Derivative valuations can be affected by changes in interest rates, currency exchange rates, financial indices, credit spreads, default risk (including the counterparties to the contract), and market volatility. The significant inputs to the pricing models for most OTC derivatives are inputs that are observable or

can be corroborated by observable market data and are classified as Level 2. Inputs that are observable generally include interest rates, foreign currency exchange rates and interest rate curves. However, certain OTC derivatives may rely on inputs that are significant to the fair value that are not observable in the market or cannot be derived principally from, or corroborated by, observable market data and these derivatives are classified as Level 3. Inputs that are unobservable generally include broker quotes, volatilities and inputs that are outside of the observable portion of the interest rate curve or other relevant market measures. These unobservable inputs may involve significant management judgment or estimation. Even though unobservable, these inputs are based on assumptions deemed appropriate given the circumstances and consistent with what market participants would use when pricing such instruments. The Company's use of unobservable inputs is limited and the impact on derivative fair values does not represent a material amount as evidenced by the limited amount of Level 3 derivatives. The credit risk of both the counterparty and the Company are considered in determining the fair value for all OTC derivatives after considering the effects of netting agreements and collateral arrangements.

The following table presents gross notional amount and fair value of derivative instruments by the underlying risk exposure.

As at December 31,		2018			2017		
Type of hedge	Instrument type	Notional amount	Fair value		Notional amount	Fair value	
			Assets	Liabilities		Assets	Liabilities
Qualifying hedge accounting relationships							
Fair value hedges	Interest rate swaps	\$ 519	\$ –	\$ 13	\$ 548	\$ –	\$ 20
	Foreign currency swaps	91	5	–	84	1	4
Cash flow hedges	Foreign currency swaps	1,834	80	367	1,757	20	333
	Forward contracts	80	–	9	165	–	4
	Equity contracts	101	–	12	125	16	1
Net investment hedges	Foreign currency forwards	1,864	21	65	–	–	–
Total derivatives in qualifying hedge accounting relationships		4,489	106	466	2,679	37	362
Derivatives not designated in qualifying hedge accounting relationships							
	Interest rate swaps	300,704	11,204	5,675	246,270	12,984	6,251
	Interest rate futures	14,297	–	–	11,551	–	–
	Interest rate options	11,736	314	–	10,093	312	–
	Foreign currency swaps	23,156	747	1,341	16,321	494	1,122
	Currency rate futures	4,052	–	–	3,157	–	–
	Forward contracts	29,248	670	158	20,341	915	65
	Equity contracts	15,492	653	163	13,597	813	22
	Credit default swaps	652	9	–	606	14	–
	Equity futures	10,908	–	–	12,158	–	–
Total derivatives not designated in qualifying hedge accounting relationships		410,245	13,597	7,337	334,094	15,532	7,460
Total derivatives		\$ 414,734	\$ 13,703	\$ 7,803	\$ 336,773	\$ 15,569	\$ 7,822

The following table presents fair values of derivative instruments by the remaining term to maturity. The fair values disclosed below do not incorporate the impact of master netting agreements. Refer to note 9.

As at December 31, 2018	Remaining term to maturity				
	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Derivative assets	\$ 649	\$ 671	\$ 795	\$ 11,588	\$ 13,703
Derivative liabilities	359	229	227	6,988	7,803

As at December 31, 2017	Remaining term to maturity				
	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Derivative assets	\$ 605	\$ 822	\$ 889	\$ 13,253	\$ 15,569
Derivative liabilities	224	149	168	7,281	7,822

The following table presents gross notional amount by the remaining term to maturity, total fair value (including accrued interest), credit risk equivalent and risk-weighted amount by contract type.

	Remaining term to maturity (notional amounts)				Fair value			Credit risk equivalent ⁽¹⁾	Risk-weighted amount ⁽²⁾
	Under 1 year	1 to 5 years	Over 5 years	Total	Positive	Negative	Net		
As at December 31, 2018									
Interest rate contracts									
OTC swap contracts	\$ 3,495	\$ 22,568	\$ 121,817	\$ 147,880	\$ 11,750	\$ (6,477)	\$ 5,273	\$ 5,301	\$ 787
Cleared swap contracts	5,723	16,140	131,480	153,343	95	(96)	(1)	—	—
Forward contracts	10,258	14,300	648	25,206	637	(126)	511	259	37
Futures	14,297	—	—	14,297	—	—	—	—	—
Options purchased	1,166	4,981	5,589	11,736	317	—	317	376	58
Subtotal	34,939	57,989	259,534	352,462	12,799	(6,699)	6,100	5,936	882
Foreign exchange									
Swap contracts	1,024	6,281	17,776	25,081	807	(1,736)	(929)	2,309	256
Forward contracts	5,926	60	—	5,986	54	(106)	(52)	108	13
Futures	4,052	—	—	4,052	—	—	—	—	—
Credit derivatives	143	509	—	652	10	—	10	—	—
Equity contracts									
Swap contracts	2,728	142	—	2,870	29	(57)	(28)	303	38
Futures	10,908	—	—	10,908	—	—	—	—	—
Options purchased	6,142	6,581	—	12,723	621	(118)	503	2,277	316
Subtotal including accrued interest	65,862	71,562	277,310	414,734	14,320	(8,716)	5,604	10,933	1,505
Less accrued interest	—	—	—	—	617	(913)	(296)	—	—
Total	\$ 65,862	\$ 71,562	\$ 277,310	\$ 414,734	\$ 13,703	\$ (7,803)	\$ 5,900	\$ 10,933	\$ 1,505

	Remaining term to maturity (notional amounts)				Fair value			Credit risk equivalent ⁽¹⁾	Risk-weighted amount ⁽²⁾
	Under 1 year	1 to 5 years	Over 5 years	Total	Positive	Negative	Net		
As at December 31, 2017									
Interest rate contracts									
OTC swap contracts	\$ 7,161	\$ 19,141	\$ 112,412	\$ 138,714	\$ 13,379	\$ (6,867)	\$ 6,512	\$ 6,588	\$ 809
Cleared swap contracts	1,615	12,928	93,561	108,104	245	(206)	39	—	—
Forward contracts	6,036	10,614	675	17,325	903	(38)	865	285	35
Futures	11,551	—	—	11,551	—	—	—	—	—
Options purchased	816	3,856	5,421	10,093	312	—	312	471	61
Subtotal	27,179	46,539	212,069	285,787	14,839	(7,111)	7,728	7,344	905
Foreign exchange									
Swap contracts	999	4,481	12,682	18,162	510	(1,483)	(973)	1,874	200
Forward contracts	3,046	135	—	3,181	12	(31)	(19)	101	12
Futures	3,157	—	—	3,157	—	—	—	—	—
Credit derivatives	38	568	—	606	14	—	14	—	—
Equity contracts									
Swap contracts	2,612	169	—	2,781	60	(14)	46	337	35
Futures	12,158	—	—	12,158	—	—	—	—	—
Options purchased	4,693	6,148	100	10,941	769	(10)	759	2,606	305
Subtotal including accrued interest	53,882	58,040	224,851	336,773	16,204	(8,649)	7,555	12,262	1,457
Less accrued interest	—	—	—	—	635	(827)	(192)	—	—
Total	\$ 53,882	\$ 58,040	\$ 224,851	\$ 336,773	\$ 15,569	\$ (7,822)	\$ 7,747	\$ 12,262	\$ 1,457

⁽¹⁾ Credit risk equivalent is the sum of replacement cost and the potential future credit exposure. Replacement cost represents the current cost of replacing all contracts with a positive fair value. The amounts take into consideration legal contracts that permit offsetting of positions. The potential future credit exposure is calculated based on a formula prescribed by OSFI.

⁽²⁾ Risk-weighted amount represents the credit risk equivalent, weighted according to the creditworthiness of the counterparty, as prescribed by OSFI.

The total notional amount of \$415 billion (2017 – \$337 billion) includes \$136 billion (2017 – \$114 billion) related to derivatives utilized in the Company's variable annuity guarantee dynamic hedging and macro equity risk hedging programs. Due to the Company's variable annuity hedging practices, a large number of trades are in offsetting positions, resulting in materially lower net fair value exposure to the Company than what the gross notional amount would suggest.

Fair value and the fair value hierarchy of derivative instruments

As at December 31, 2018	Fair value	Level 1	Level 2	Level 3
Derivative assets				
Interest rate contracts	\$ 12,155	\$ –	\$ 11,537	\$ 618
Foreign exchange contracts	886	–	876	10
Equity contracts	653	–	621	32
Credit default swaps	9	–	9	–
Total derivative assets	\$ 13,703	\$ –	\$ 13,043	\$ 660
Derivative liabilities				
Interest rate contracts	\$ 5,815	\$ –	\$ 5,318	\$ 497
Foreign exchange contracts	1,814	–	1,813	1
Equity contracts	174	–	118	56
Total derivative liabilities	\$ 7,803	\$ –	\$ 7,249	\$ 554

As at December 31, 2017	Fair value	Level 1	Level 2	Level 3
Derivative assets				
Interest rate contracts	\$ 14,199	\$ –	\$ 13,181	\$ 1,018
Foreign exchange contracts	527	–	527	–
Equity contracts	829	–	768	61
Credit default swaps	14	–	14	–
Total derivative assets	\$ 15,569	\$ –	\$ 14,490	\$ 1,079
Derivative liabilities				
Interest rate contracts	\$ 6,309	\$ –	\$ 6,012	\$ 297
Foreign exchange contracts	1,490	–	1,490	–
Equity contracts	23	–	10	13
Total derivative liabilities	\$ 7,822	\$ –	\$ 7,512	\$ 310

The following table presents a roll forward for net derivative contracts measured at fair value using significant unobservable inputs (Level 3).

For the years ended December 31,	2018	2017
Balance at the beginning of the year	\$ 769	\$ 163
Net realized / unrealized gains (losses) included in:		
Net income ⁽¹⁾	(666)	1,082
OCI ⁽²⁾	(48)	(9)
Purchases	12	22
Settlements	18	(103)
Transfers		
Into Level 3 ⁽³⁾	9	–
Out of Level 3 ⁽³⁾	(13)	(363)
Currency movement	25	(23)
Balance at the end of the year	\$ 106	\$ 769
Change in unrealized gains (losses) on instruments still held	\$ (460)	\$ 832

⁽¹⁾ These amounts are included in investment income on the Consolidated Statements of Income.

⁽²⁾ These amounts are included in AOCI on the Consolidated Statements of Financial Position.

⁽³⁾ For derivatives transferred into and out of Level 3, the Company uses the fair value of the items at the end and beginning of the period, respectively. Transfers into Level 3 occur when the inputs used to price the assets and liabilities lack observable market data (versus the previous year). Transfers out of Level 3 occur when the inputs used to price the assets and liabilities become available from observable market data.

(b) Hedging relationships

The Company uses derivatives for economic hedging purposes. In certain circumstances, these hedges also meet the requirements of hedge accounting. Risk management strategies eligible for hedge accounting are designated as fair value hedges, cash flow hedges or net investment hedges, as described below.

Fair value hedges

The Company uses interest rate swaps to manage its exposure to changes in the fair value of fixed rate financial instruments due to changes in interest rates. The Company also uses cross currency swaps to manage its exposure to foreign exchange rate fluctuations, interest rate fluctuations, or both.

The Company recognizes gains and losses on derivatives and the related hedged items in fair value hedges in investment income. These investment gains (losses) are shown in the following table.

	Hedged items in qualifying fair value hedging relationships	Gains (losses) recognized on derivatives	Gains (losses) recognized for hedged items	Ineffectiveness recognized in investment income
For the year ended December 31, 2018				
Interest rate swaps	Fixed rate assets	\$ 1	\$ (1)	\$ –
	Fixed rate liabilities	3	(3)	–
Foreign currency swaps	Fixed rate assets	7	(5)	2
Total		\$ 11	\$ (9)	\$ 2

	Hedged items in qualifying fair value hedging relationships	Gains (losses) recognized on derivatives	Gains (losses) recognized for hedged items	Ineffectiveness recognized in investment income
For the year ended December 31, 2017				
Interest rate swaps	Fixed rate assets	\$ 2	\$ (3)	\$ (1)
	Fixed rate liabilities	(17)	17	–
Foreign currency swaps	Fixed rate assets	(2)	4	2
Total		\$ (17)	\$ 18	\$ 1

Cash flow hedges

The Company uses interest rate swaps to hedge the variability in cash flows from variable rate financial instruments and forecasted transactions. The Company also uses cross currency swaps and foreign currency forward contracts to hedge the variability from foreign currency financial instruments and foreign currency expenses. Total return swaps are used to hedge the variability in cash flows associated with certain stock-based compensation awards. Inflation swaps are used to reduce inflation risk generated from inflation-indexed liabilities.

The effects of derivatives in cash flow hedging relationships on the Consolidated Statements of Income and the Consolidated Statements of Comprehensive Income are shown in the following table.

	Hedged items in qualifying cash flow hedging relationships	Gains (losses) deferred in AOCI on derivatives	Gains (losses) reclassified from AOCI into investment income	Ineffectiveness recognized in investment income
For the year ended December 31, 2018				
Interest rate swaps	Forecasted liabilities	\$ –	\$ (20)	\$ –
Foreign currency swaps	Fixed rate assets	–	(1)	–
	Floating rate liabilities	(36)	(62)	–
	Fixed rate liabilities	60	62	–
Forward contracts	Forecasted expenses	(8)	(2)	–
Equity contracts	Stock-based compensation	(21)	27	–
Total		\$ (5)	\$ 4	\$ –

	Hedged items in qualifying cash flow hedging relationships	Gains (losses) deferred in AOCI on derivatives	Gains (losses) reclassified from AOCI into investment income	Ineffectiveness recognized in investment income
For the year ended December 31, 2017				
Interest rate swaps	Forecasted liabilities	\$ –	\$ (17)	\$ –
Foreign currency swaps	Fixed rate assets	3	(1)	–
	Floating rate liabilities	95	50	–
	Fixed rate liabilities	35	7	–
Forward contracts	Forecasted expenses	10	(10)	–
Equity contracts	Stock-based compensation	20	29	–
Total		\$ 163	\$ 58	\$ –

The Company anticipates that net losses of approximately \$31 will be reclassified from AOCI to net income within the next 12 months. The maximum time frame for which variable cash flows are hedged is 18 years.

Hedges of net investments in foreign operations

The Company primarily uses forward currency contracts, cross currency swaps and non-functional currency denominated debt to manage its foreign currency exposures to net investments in foreign operations.

The effects of net investment hedging relationships on the Consolidated Statements of Income and the Consolidated Statements of Other Comprehensive Income are shown in the following table.

	Gains (losses) deferred in AOCI on derivatives	Gains (losses) reclassified from AOCI into investment income	Ineffectiveness recognized in investment income
For the year ended December 31, 2018			
Non-functional currency denominated debt	\$ (469)	\$ –	\$ –
Foreign currency forward	9	–	–
Total	\$ (460)	\$ –	\$ –
	Gains (losses) deferred in AOCI on derivatives	Gains (losses) reclassified from AOCI into investment income	Ineffectiveness recognized in investment income
For the year ended December 31, 2017			
Non-functional currency denominated debt	\$ 355	\$ –	\$ –
Total	\$ 355	\$ –	\$ –

(c) Derivatives not designated in qualifying hedge accounting relationships

Derivatives used in portfolios supporting insurance contract liabilities are generally not designated in qualifying hedge accounting relationships because the change in the value of the insurance contract liabilities economically hedged by these derivatives is also recorded through net income. Since changes in fair value of these derivatives and related hedged risks are recognized in investment income as they occur, they generally offset the change in hedged risk to the extent the hedges are economically effective. Interest rate and cross currency swaps are used in the portfolios supporting insurance contract liabilities to manage duration and currency risks.

Investment income on derivatives not designated in qualifying hedge accounting relationships

For the years ended December 31,	2018	2017
Interest rate swaps	\$ (1,894)	\$ (927)
Interest rate futures	(298)	372
Interest rate options	(52)	(96)
Foreign currency swaps	(122)	529
Currency rate futures	3	(92)
Forward contracts	(355)	1,231
Equity futures	742	(2,190)
Equity contracts	(276)	153
Credit default swaps	(6)	(4)
Total	\$ (2,258)	\$ (1,024)

(d) Embedded derivatives

Certain insurance contracts contain features that are classified as embedded derivatives and are measured separately at FVTPL including reinsurance contracts related to guaranteed minimum income benefits and contracts containing certain credit and interest rate features.

Certain reinsurance contracts related to guaranteed minimum income benefits contain embedded derivatives requiring separate measurement at FVTPL as the financial component contained in the reinsurance contracts does not contain significant insurance risk. As at December 31, 2018, reinsurance ceded guaranteed minimum income benefits had a fair value of \$1,148 (2017 – \$1,079) and reinsurance assumed guaranteed minimum income benefits had a fair value of \$114 (2017 – \$100). Claims recovered under reinsurance ceded contracts offset claims expenses and claims paid on the reinsurance assumed are reported as contract benefits.

The Company's credit and interest rate embedded derivatives promise to pay the returns on a portfolio of assets to the contract holder. These embedded derivatives contain a credit and interest rate risk that is a financial risk embedded in the underlying insurance contract. As at December 31, 2018, these embedded derivatives had a fair value of \$53 (2017 – \$123).

Other financial instruments classified as embedded derivatives but exempt from separate measurement at fair value include variable universal life and variable life products, minimum guaranteed credited rates, no lapse guarantees, guaranteed annuitization options, CPI indexing of benefits, and segregated fund minimum guarantees other than reinsurance ceded/assumed guaranteed minimum income benefits. These embedded derivatives are measured and reported within insurance contract liabilities and are exempt from separate fair value measurement as they contain insurance risk and/or are closely related to the insurance host contract.

Note 5 Income Taxes

(a) Components of the income tax expense (recovery)

Income tax expenses (recovery) recognized in the Consolidated Statements of Income

For the years ended December 31,	2018	2017
Current tax		
Current year	\$ (327)	\$ 608
Adjustments to prior year	29	(38)
	(298)	570
Deferred tax		
Change related to temporary differences	1,250	(803)
Impact of U.S. Tax Reform	(320)	472
Income tax expense	\$ 632	\$ 239

Income tax expenses (recovery) recognized in Other Comprehensive Income

For the years ended December 31,	2018	2017
Current income tax expense (recovery)	\$ 2	\$ 116
Deferred income tax expense (recovery)	(148)	320
Income tax expense (recovery)	\$ (146)	\$ 436

Income tax expenses (recovery) recognized directly in Equity

For the years ended December 31,	2018	2017
Current income tax expense (recovery)	\$ 6	\$ –
Deferred income tax expense (recovery)	(7)	(2)
Income tax expense (recovery)	\$ (1)	\$ (2)

The effective income tax rate reflected in the Consolidated Statements of Income varies from the Canadian tax rate of 26.75 per cent for the year ended December 31, 2018 (2017 – 26.75 per cent) due to the following reasons.

Reconciliation of income tax expense

For the years ended December 31,	2018	2017
Income before income taxes	\$ 5,519	\$ 2,501
Income tax expense at Canadian statutory tax rate	\$ 1,476	\$ 669
Increase (decrease) in income taxes due to:		
Tax-exempt investment income	(200)	(242)
Differences in tax rate on income not subject to tax in Canada	(391)	(551)
Adjustments to taxes related to prior years	(71)	(182)
Impact of U.S. Tax Reform	(320)	472
Other differences	138	73
Income tax expense	\$ 632	\$ 239

Impact of U.S. Tax Reform

On December 22, 2017, the U.S. government enacted new tax legislation effective January 1, 2018. The legislation makes broad and complex changes to the U.S. tax code and accordingly it will take time to assess and interpret the changes. In 2017, based on a preliminary understanding of the new legislation, the Company recorded a provisional charge of \$1.8 billion, after-tax, for the estimated impact of U.S. Tax Reform on policyholder liabilities and net deferred tax assets, including the reduction in the U.S. federal corporate income tax rate and the impact of specific life insurance regulations which limits the deductibility of reserves for U.S. federal income tax purposes. In 2018, the Company finalized its estimate of U.S. Tax Reform and reported a gain of \$124 including a \$196 increase in insurance contract liabilities. Refer to note 7(g) for the impact of U.S. Tax Reform on the Company's insurance contract liabilities.

(b) Current tax receivable and payable

As at December 31, 2018, the Company had approximately \$1,712 of tax receivable (2017 – \$778) and \$118 of tax payable (2017 – \$178).

(c) Deferred tax assets and liabilities

The following table presents the Company's deferred tax assets and liabilities.

As at December 31,	2018	2017
Deferred tax assets	\$ 4,318	\$ 4,569
Deferred tax liabilities	(1,814)	(1,281)
Net deferred tax assets (liabilities)	\$ 2,504	\$ 3,288

The following table presents significant components of the Company's deferred tax assets and liabilities.

As at December 31, 2018	Balance, January 1, 2018	Recognized in Income Statement	Recognized in Other Comprehensive Income	Recognized in Equity	Translation and Other	Balance, December 31, 2018
Loss carry forwards	\$ 596	\$ 387	\$ –	\$ 7	\$ 29	\$ 1,019
Actuarial liabilities	7,878	(2,697)	–	3	282	5,466
Pensions and post-employment benefits	208	27	7	–	–	242
Tax credits	454	(224)	–	–	31	261
Accrued interest	1	–	–	–	–	1
Real estate	(1,062)	150	(1)	–	(46)	(959)
Securities and other investments	(3,807)	1,234	136	1	(253)	(2,689)
Sale of investments	(105)	18	–	–	–	(87)
Goodwill and intangible assets	(825)	18	–	–	(40)	(847)
Other	(50)	157	6	(4)	(12)	97
Total	\$ 3,288	\$ (930)	\$ 148	\$ 7	\$ (9)	\$ 2,504

As at December 31, 2017	Balance, January 1, 2017	Recognized in Income Statement	Recognized in Other Comprehensive Income	Recognized in Equity	Translation and Other	Balance, December 31, 2017
Loss carry forwards	\$ 942	\$ (311)	\$ –	\$ 3	\$ (38)	\$ 596
Actuarial liabilities	9,366	(1,053)	(17)	–	(418)	7,878
Pensions and post-employment benefits	352	(87)	(54)	–	(3)	208
Tax credits	875	(369)	–	–	(52)	454
Accrued interest	17	(12)	–	(3)	(1)	1
Real estate	(1,396)	284	(9)	–	59	(1,062)
Securities and other investments	(6,064)	2,172	(239)	–	324	(3,807)
Sale of investments	(163)	58	–	–	–	(105)
Goodwill and intangible assets	(1,059)	197	–	–	37	(825)
Other	210	(548)	(1)	2	287	(50)
Total	\$ 3,080	\$ 331	\$ (320)	\$ 2	\$ 195	\$ 3,288

The total deferred tax assets as at December 31, 2018 of \$4,318 (2017 – \$4,569) include \$3,508 (2017 – \$4,527) where the Company has suffered losses in either the current or preceding year and where the recognition is dependent on future taxable profits in the relevant jurisdictions and feasible management actions.

As at December 31, 2018, tax loss carryforwards available were approximately \$4,838 (2017 – \$3,164) of which \$4,713 expire between the years 2020 and 2038 while \$125 have no expiry date, and capital loss carryforwards available were approximately \$20 (2017 – \$8) and have no expiry date. A \$1,019 (2017 – \$596) tax benefit related to these tax loss carryforwards has been recognized as a deferred tax asset as at December 31, 2018, and a benefit of \$121 (2017 – \$171) has not been recognized. In addition, the Company has approximately \$426 (2017 – \$606) of tax credit carryforwards which will expire between the years 2030 and 2038 of which a benefit of \$165 (2017 – \$152) has not been recognized.

The total deferred tax liability as at December 31, 2018 was \$1,814 (2017 – \$1,281). This amount includes the deferred tax liability of consolidated entities. The aggregate amount of taxable temporary differences associated with the Company's own investments in subsidiaries is not included in the Consolidated Financial Statements and was \$16,570 (2017 – \$11,780).

Note 6 Goodwill and Intangible Assets

(a) Carrying amounts of goodwill and intangible assets

As at December 31, 2018	Balance, January 1, 2018	Additions/ disposals ⁽³⁾	Amortization expense	Effect of changes in foreign exchange rates	Balance, December 31, 2018
Goodwill	\$ 5,713	\$ (65)	\$ n/a	\$ 216	\$ 5,864
Indefinite life intangible assets					
Brand	753	–	n/a	66	819
Fund management contracts and other ⁽¹⁾	755	3	n/a	40	798
	1,508	3	n/a	106	1,617
Finite life intangible assets⁽²⁾					
Distribution networks	989	(133)	48	60	868
Customer relationships	899	–	55	16	860
Software	661	275	147	32	821
Other	70	–	5	2	67
	2,619	142	255	110	2,616
Total intangible assets	4,127	145	255	216	4,233
Total goodwill and intangible assets	\$ 9,840	\$ 80	\$ 255	\$ 432	\$ 10,097

As at December 31, 2017	Balance, January 1, 2017	Additions/ disposals	Amortization expense	Effect of changes in foreign exchange rates	Balance, December 31, 2017
Goodwill	\$ 5,884	\$ –	\$ n/a	\$ (171)	\$ 5,713
Indefinite life intangible assets					
Brand	805	–	n/a	(52)	753
Fund management contracts and other ⁽¹⁾	785	–	n/a	(30)	755
	1,590	–	n/a	(82)	1,508
Finite life intangible assets⁽²⁾					
Distribution networks	1,093	–	47	(57)	989
Customer relationships	969	–	56	(14)	899
Software	494	303	121	(15)	661
Other	77	–	5	(2)	70
	2,633	303	229	(88)	2,619
Total intangible assets	4,223	303	229	(170)	4,127
Total goodwill and intangible assets	\$ 10,107	\$ 303	\$ 229	\$ (341)	\$ 9,840

⁽¹⁾ For fund management contracts, the significant CGUs to which these were allocated and their associated carrying values were U.S. WAM with \$400 (2017 – \$367) and Canada WAM with \$273 (2017 – \$273).

⁽²⁾ Gross carrying amount of finite life intangible assets was \$1,331 for distribution networks, \$1,145 for customer relationships, \$2,110 for software and \$133 for other (2017 – \$1,294, \$1,128, \$1,841 and \$126, respectively).

⁽³⁾ In 2018, disposals include \$65 of goodwill and \$96 of distribution networks from the sale of the U.S. broker-dealer business, and impairments of distribution networks for discontinued products of \$27 in U.S. segment and \$13 in Asia segment.

(b) Goodwill impairment testing

In the fourth quarter of 2018, the Company completed its annual goodwill impairment testing by determining the recoverable amounts of its businesses using valuation techniques discussed below or based on the most recent detailed similar calculations made in a prior period (refer to notes 1(f) and 6(c)). The Company has determined that there was no impairment of goodwill in 2018 and 2017.

Effective January 1, 2018, the Company made organizational changes to drive better alignment with strategic priorities and increase focus and leverage scale in its wealth management business. As a result of this reorganization, which included recognition of the Company's wealth and asset management businesses (Global WAM) as a primary reporting segment (note 19), the Company has modified the level at which goodwill is tested for impairment purposes. The modification includes (a) the allocation of existing goodwill to the relevant CGUs or group of CGUs within the Global WAM segment that had previously been combined within respective regional insurance businesses and (b) the amalgamation of the remaining Canadian-based goodwill (including Individual Life, Affinity Markets, Individual Annuities, Group Benefits and International Group Program) under the Canadian Insurance reporting segment. These reorganization-based changes have resulted in goodwill being allocated to CGUs or groups of CGUs based on the lowest level within the Company in which goodwill is monitored for internal management purposes. The prior period amounts have been restated to reflect the reorganized CGUs.

The following tables present the carrying value of goodwill by CGU or group of CGUs.

As at December 31, 2018 CGU or group of CGUs	Balance, January 1, 2018	Additions/ disposals	Effect of changes in foreign exchange rates	Balance, December 31, 2018
Asia				
Asia Insurance (excluding Japan)	\$ 154	\$ –	\$ 11	\$ 165
Japan Insurance	391	–	44	435
Canada Insurance	1,954	–	8	1,962
U.S. Insurance	400	(65)	32	367
Global Wealth and Asset Management				
Asia WAM	180	–	16	196
Canada WAM	1,436	–	–	1,436
U.S. WAM	1,198	–	105	1,303
Total	\$ 5,713	\$ (65)	\$ 216	\$ 5,864

As at December 31, 2017 CGU or group of CGUs	Balance, January 1, 2017	Additions/ disposals	Effect of changes in foreign exchange rates	Balance, December 31, 2017
Asia				
Asia Insurance (excluding Japan)	\$ 160	\$ –	\$ (6)	\$ 154
Japan Insurance	403	–	(12)	391
Canada Insurance	1,960	–	(6)	1,954
U.S. Insurance	428	–	(28)	400
Global Wealth and Asset Management				
Asia WAM	194	–	(14)	180
Canada WAM	1,436	–	–	1,436
U.S. WAM	1,303	–	(105)	1,198
Total	\$ 5,884	\$ –	\$ (171)	\$ 5,713

The valuation techniques, significant assumptions and sensitivities, where applicable, applied in the goodwill impairment testing are described below.

(c) Valuation techniques

The recoverable amounts were based on fair value less costs to sell ("FVLCS") for Asia Insurance (excluding Japan), Asia WAM and for certain CGUs within Canada Insurance and U.S. WAM CGU groups. For other CGUs, value-in-use ("VIU") was used. When determining if a CGU is impaired, the Company compares its recoverable amount to the allocated capital for that unit, which is aligned with the Company's internal reporting practices.

Under the FVLCS approach, the Company determines the fair value of the CGU or group of CGUs using an earnings-based approach which incorporates forecasted earnings, excluding interest and equity market impacts and normalized new business expenses multiplied by an earnings-multiple derived from the observable price-to-earnings multiples of comparable financial institutions. The price-to-earnings multiples used by the Company for testing ranged from 9.0 to 11.7 (2017 – 10.6 to 14.8).

Under the VIU approach, used for CGUs with insurance business, an embedded appraisal value is determined from a projection of future distributable earnings derived from both the in-force business and new business expected to be sold in the future, and therefore, reflects the economic value for each CGU's or group of CGUs' profit potential under a set of assumptions. This approach requires assumptions including sales and revenue growth rates, capital requirements, interest rates, equity returns, mortality, morbidity, policyholder behaviour, tax rates and discount rates. For non-insurance CGUs, the VIU is based on discounted cash flow analysis which incorporates relevant aspects of the embedded appraisal value approach.

(d) Significant assumptions

To calculate embedded value, the Company discounted projected earnings from in-force contracts and valued 10 years of new business growing at expected plan levels, consistent with the periods used for forecasting long-term businesses such as insurance. In arriving at its projections, the Company considered past-experience, economic trends such as interest rates, equity returns and product mix as well as industry and market trends. Where growth rate assumptions for new business cash flows were used in the embedded value calculations, they ranged from zero per cent to 17 per cent (2017 – negative five per cent to 17 per cent).

Interest rate assumptions are based on prevailing market rates at the valuation date.

Tax rates applied to the projections include the impact of internal reinsurance treaties and amounted to 30.8 per cent, 26.8 per cent and 21 per cent (2017 – 30.8 per cent, 26.8 per cent and 35 per cent) for the Japan, Canadian and U.S. jurisdictions, respectively. Tax assumptions are sensitive to changes in tax laws as well as assumptions about the jurisdictions in which profits are earned. It is possible that actual tax rates could differ from those assumed.

Discount rates assumed in determining the value-in-use for applicable CGUs or groups of CGUs ranged from 7.5 per cent to 14.2 per cent on an after-tax basis or 10.2 per cent to 20.4 per cent on a pre-tax basis (2017 – 9.2 per cent to 14.2 per cent on an after-tax basis or 11.3 per cent to 20.4 per cent on a pre-tax basis).

The key assumptions described above may change as economic and market conditions change, which may lead to impairment charges in the future. Changes in discount rates and cash flow projections used in the determination of embedded values or reductions in market-based earnings multiples may result in impairment charges in the future which could be material.

Note 7 Insurance Contract Liabilities and Reinsurance Assets

(a) Insurance contract liabilities and reinsurance assets

Insurance contract liabilities are reported gross of reinsurance ceded and the ceded liabilities are reported separately as a reinsurance asset. Insurance contract liabilities include actuarial liabilities, benefits payable, provision for unreported claims and policyholder amounts on deposit. The components of gross and net insurance contract liabilities are shown below.

As at December 31,	2018	2017
Gross insurance contract liabilities	\$ 313,737	\$ 291,767
Gross benefits payable and provision for unreported claims	4,398	3,376
Gross policyholder amounts on deposit	10,519	9,462
Gross insurance contract liabilities	328,654	304,605
Reinsurance assets ⁽¹⁾	(42,925)	(30,359)
Net insurance contract liabilities	\$ 285,729	\$ 274,246

⁽¹⁾ The Company also holds reinsurance assets of \$128 (2017 – \$nil) for investment contract liabilities, refer to note 8(b).

Net insurance contract liabilities represent the amount which, together with estimated future premiums and net investment income, will be sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (other than income taxes) and expenses on policies in-force net of reinsurance premiums and recoveries.

Net insurance contract liabilities are determined using CALM, as required by the Canadian Institute of Actuaries.

The determination of net insurance contract liabilities is based on an explicit projection of cash flows using current assumptions for each material cash flow item. Investment returns are projected using the current asset portfolios and projected reinvestment strategies.

Each assumption is based on the best estimate adjusted by a margin for adverse deviation. For fixed income returns, this margin is established by scenario testing a range of prescribed and company-developed scenarios consistent with Canadian Actuarial Standards of Practice. For all other assumptions, this margin is established by directly adjusting the best estimate assumption.

Cash flows used in the net insurance contract liabilities valuation adjust the gross policy cash flows to reflect projected cash flows from ceded reinsurance. The cash flow impact of ceded reinsurance varies depending upon the amount of reinsurance, the structure of reinsurance treaties, the expected economic benefit from treaty cash flows and the impact of margins for adverse deviation. Gross insurance contract liabilities are determined by discounting gross policy cash flows using the same discount rate as the net CALM model discount rate.

The reinsurance asset is determined by taking the difference between the gross insurance contract liabilities and the net insurance contract liabilities. The reinsurance asset represents the benefit derived from reinsurance arrangements in force at the date of the Consolidated Statements of Financial Position.

The period used for the projection of cash flows is the policy lifetime for most individual insurance contracts. For other types of contracts, a shorter projection period may be used, with the contract generally ending at the earlier of the first renewal date on or after the Consolidated Statements of Financial Position date where the Company can exercise discretion in renewing its contractual obligations or terms of those obligations and the renewal or adjustment date that maximizes the insurance contract liabilities. For segregated fund products with guarantees, the projection period is generally set as the period that leads to the largest insurance contract liability. Where the projection period is less than the policy lifetime, insurance contract liabilities may be reduced by an allowance for acquisition expenses expected to be recovered from policy cash flows beyond the projection period used for the liabilities. Such allowances are tested for recoverability using assumptions that are consistent with other components of the actuarial valuation.

(b) Composition

The composition of insurance contract liabilities and reinsurance assets by the line of business and reporting segment is as follows.

Gross insurance contract liabilities

	Individual insurance				Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
	Participating	Non-participating	Annuities and pensions	Other insurance contract liabilities ⁽¹⁾			
As at December 31, 2018							
Asia	\$ 38,470	\$ 29,547	\$ 5,062	\$ 3,048	\$ 76,127	\$ 1,332	\$ 77,459
Canada	10,743	34,677	18,339	12,869	76,628	(202)	76,426
U.S.	8,673	63,412	16,125	44,932	133,142	41,695	174,837
Corporate and Other	–	(601)	46	387	(168)	100	(68)
Total, net of reinsurance ceded	57,886	127,035	39,572	61,236	285,729	\$42,925	\$328,654
Total reinsurance ceded	11,596	12,303	17,927	1,099	42,925		
Total, gross of reinsurance ceded	\$ 69,482	\$ 139,338	\$ 57,499	\$ 62,335	\$ 328,654		

	Individual insurance				Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
	Participating	Non-participating	Annuities and pensions	Other insurance contract liabilities ⁽¹⁾			
As at December 31, 2017							
Asia	\$ 32,737	\$ 22,705	\$ 4,366	\$ 2,435	\$ 62,243	\$ 911	\$ 63,154
Canada	11,132	34,091	19,141	11,834	76,198	(676)	75,522
U.S.	8,569	57,599	26,161	43,522	135,851	29,952	165,803
Corporate and Other	–	(515)	48	421	(46)	172	126
Total, net of reinsurance ceded	52,438	113,880	49,716	58,212	274,246	\$30,359	\$304,605
Total reinsurance ceded	11,492	11,238	6,539	1,090	30,359		
Total, gross of reinsurance ceded	\$ 63,930	\$ 125,118	\$ 56,255	\$ 59,302	\$ 304,605		

⁽¹⁾ Other insurance contract liabilities include group insurance and individual and group health including long-term care insurance.

Separate sub-accounts were established for participating policies in-force at the demutualization of MLI and John Hancock Mutual Life Insurance Company. These sub-accounts permit this participating business to be operated as separate “closed blocks” of participating policies. As at December 31, 2018, \$28,790 (2017 – \$28,135) of both assets and insurance contract liabilities were related to these closed blocks of participating policies.

(c) Assets backing insurance contract liabilities, other liabilities and capital

Assets are segmented and matched to liabilities with similar underlying characteristics by product line and major currency. The Company has established target investment strategies and asset mixes for each asset segment supporting insurance contract liabilities which consider the risk attributes of the liabilities supported by the assets and expectations of market performance. Liabilities with rate and term guarantees are predominantly backed by fixed-rate instruments on a cash flow matching basis for a targeted duration horizon. Longer duration cash flows on these liabilities as well as on adjustable products such as participating life insurance are backed by a broader range of asset classes, including equity and alternative long-duration investments. The Company’s capital is invested in a range of debt and equity investments, both public and private.

Changes in the fair value of assets backing net insurance contract liabilities, that the Company considers to be other than temporary, would have a limited impact on the Company’s net income wherever there is an effective matching of assets and liabilities, as these changes would be substantially offset by corresponding changes in the value of net insurance contract liabilities. The fair value of assets backing net insurance contract liabilities as at December 31, 2018, excluding reinsurance assets, was estimated at \$287,326 (2017 – \$278,521).

As at December 31, 2018, the fair value of assets backing capital and other liabilities was estimated at \$465,497 (2017 – \$456,278).

The following table presents the carrying value of assets backing net insurance contract liabilities, other liabilities and capital.

As at December 31, 2018	Individual insurance		Annuities and pensions	Other insurance contract liabilities ⁽¹⁾	Other liabilities ⁽²⁾	Capital ⁽³⁾	Total
	Participating	Non-participating					
Assets							
Debt securities	\$ 30,934	\$ 67,387	\$ 20,469	\$ 28,435	\$ 10,061	\$ 28,308	\$ 185,594
Public equities	8,416	5,562	172	262	589	4,178	19,179
Mortgages	2,218	11,111	4,972	8,732	21,295	35	48,363
Private placements	4,151	14,131	6,960	8,581	1,772	159	35,754
Real estate	3,106	6,028	1,214	1,799	397	233	12,777
Other	9,061	22,816	5,785	13,427	374,418	23,097	448,604
Total	\$ 57,886	\$ 127,035	\$ 39,572	\$ 61,236	\$ 408,532	\$ 56,010	\$ 750,271

As at December 31, 2017	Individual insurance		Annuities and pensions	Other insurance contract liabilities ⁽¹⁾	Other liabilities ⁽²⁾	Capital ⁽³⁾	Total
	Participating	Non-participating					
Assets							
Debt securities	\$ 27,946	\$ 63,128	\$ 26,621	\$ 25,211	\$ 6,635	\$ 24,459	\$ 174,000
Public equities	9,264	5,855	171	332	1,029	4,894	21,545
Mortgages	2,017	10,286	7,009	6,891	18,476	63	44,742
Private placements	3,645	12,128	8,059	7,739	367	194	32,132
Real estate	2,963	6,198	1,136	2,516	769	228	13,810
Other	6,603	16,285	6,720	15,523	377,352	20,821	443,304
Total	\$ 52,438	\$ 113,880	\$ 49,716	\$ 58,212	\$ 404,628	\$ 50,659	\$ 729,533

⁽¹⁾ Other insurance contract liabilities include group insurance and individual and group health including long-term care insurance.

⁽²⁾ Other liabilities are non-insurance contract liabilities which include segregated funds, bank deposits, long-term debt, deferred tax liabilities, derivatives, investment contracts, embedded derivatives and other miscellaneous liabilities.

⁽³⁾ Capital is defined in note 13.

(d) Significant insurance contract liability valuation assumptions

The determination of insurance contract liabilities involves the use of estimates and assumptions. Insurance contract liabilities have two major components: a best estimate amount and a provision for adverse deviation.

Best estimate assumptions

Best estimate assumptions are made with respect to mortality and morbidity, investment returns, rates of policy termination, operating expenses and certain taxes. Actual experience is monitored to ensure that assumptions remain appropriate and assumptions are changed as warranted. Assumptions are discussed in more detail in the following table.

Nature of factor and assumption methodology		Risk management
Mortality and morbidity	Mortality relates to the occurrence of death. Mortality is a key assumption for life insurance and certain forms of annuities. Mortality assumptions are based on the Company's internal experience as well as past and emerging industry experience. Assumptions are differentiated by sex, underwriting class, policy type and geographic market. Assumptions are made for future mortality improvements.	The Company maintains underwriting standards to determine the insurability of applicants. Claim trends are monitored on an ongoing basis. Exposure to large claims is managed by establishing policy retention limits, which vary by market and geographic location. Policies in excess of the limits are reinsured with other companies. Mortality is monitored monthly and the overall 2018 experience was favourable (2017 – unfavourable) when compared to the Company's assumptions. Morbidity is also monitored monthly and the overall 2018 experience was unfavourable (2017 – unfavourable) when compared to the Company's assumptions.
	Morbidity relates to the occurrence of accidents and sickness for insured risks. Morbidity is a key assumption for long-term care insurance, disability insurance, critical illness and other forms of individual and group health benefits. Morbidity assumptions are based on the Company's internal experience as well as past and emerging industry experience and are established for each type of morbidity risk and geographic market. Assumptions are made for future morbidity improvements.	

Nature of factor and assumption methodology	Risk management
Investment returns The Company segments assets to support liabilities by business segment and geographic market and establishes investment strategies for each liability segment. Projected cash flows from these assets are combined with projected cash flows from future asset purchases/sales to determine expected rates of return on these assets for future years. Investment strategies are based on the target investment policies for each segment and the reinvestment returns are derived from current and projected market rates for fixed income investments and a projected outlook for other alternative long-duration assets. Investment return assumptions include expected future asset credit losses on fixed income investments. Credit losses are projected based on past experience of the Company and industry as well as specific reviews of the current investment portfolio. Investment return assumptions for each asset class and geographic market also incorporate expected investment management expenses that are derived from internal cost studies. The costs are attributed to each asset class to develop unitized assumptions per dollar of asset for each asset class and geographic market.	The Company's policy of closely matching asset cash flows with those of the corresponding liabilities is designed to mitigate the Company's exposure to future changes in interest rates. The interest rate risk positions in business segments are monitored on an ongoing basis. Under CALM, the reinvestment rate is developed using interest rate scenario testing and reflects the interest rate risk positions. In 2018, the movement in interest rates positively (2017 – negatively) impacted the Company's net income. This positive impact was driven by an increase in corporate spreads, partially offset by the impact of risk free interest rate movements and swap spreads on policy liabilities. The exposure to credit losses is managed against policies that limit concentrations by issuer, corporate connections, ratings, sectors and geographic regions. On participating policies and some non-participating policies, credit loss experience is passed back to policyholders through the investment return crediting formula. For other policies, premiums and benefits reflect the Company's assumed level of future credit losses at contract inception or most recent contract adjustment date. The Company holds explicit provisions in actuarial liabilities for credit risk including provisions for adverse deviation. In 2018, credit loss experience on debt securities and mortgages was favourable (2017 – favourable) when compared to the Company's assumptions. Equities, real estate and other alternative long-duration assets are used to support liabilities where investment return experience is passed back to policyholders through dividends or credited investment return adjustments. Equities, real estate, oil and gas and other alternative long-duration assets are also used to support long-dated obligations in the Company's annuity and pension businesses and for long-dated insurance obligations on contracts where the investment return risk is borne by the Company. In 2018, investment experience on alternative long-duration assets backing policyholder liabilities was unfavourable (2017 – unfavourable) primarily due to losses in oil and gas properties, real estate properties and private equities. In 2018, alternative long-duration asset origination exceeded (2017 – exceeded) valuation requirements. In 2018, for the business that is dynamically hedged, segregated fund guarantee experience on residual, non-dynamically hedged market risks was unfavourable (2017 – favourable). For the business that is not dynamically hedged, experience on segregated fund guarantees due to changes in the market value of assets under management was also unfavourable (2017 – favourable). This excludes the experience on the macro equity hedges. In 2018, investment expense experience was unfavourable (2017 – unfavourable) when compared to the Company's assumptions.
Policy termination and premium persistency Policies are terminated through lapses and surrenders, where lapses represent the termination of policies due to non-payment of premiums and surrenders represent the voluntary termination of policies by policyholders. Premium persistency represents the level of ongoing deposits on contracts where there is policyholder discretion as to the amount and timing of deposits. Policy termination and premium persistency assumptions are primarily based on the Company's recent experience adjusted for expected future conditions. Assumptions reflect differences by type of contract within each geographic market.	The Company seeks to design products that minimize financial exposure to lapse, surrender and premium persistency risk. The Company monitors lapse, surrender and persistency experience. In aggregate, 2018 policyholder termination and premium persistency experience was unfavourable (2017 – unfavourable) when compared to the Company's assumptions used in the computation of actuarial liabilities.

Nature of factor and assumption methodology		Risk management
Expenses and taxes	Operating expense assumptions reflect the projected costs of maintaining and servicing in-force policies, including associated overhead expenses. The expenses are derived from internal cost studies projected into the future with an allowance for inflation. For some developing businesses, there is an expectation that unit costs will decline as these businesses grow. Taxes reflect assumptions for future premium taxes and other non-income related taxes. For income taxes, policy liabilities are adjusted only for temporary tax timing and permanent tax rate differences on the cash flows available to satisfy policy obligations.	The Company prices its products to cover the expected costs of servicing and maintaining them. In addition, the Company monitors expenses monthly, including comparisons of actual expenses to expense levels allowed for in pricing and valuation. Maintenance expenses for 2018 were unfavourable (2017 – unfavourable) when compared to the Company's assumptions used in the computation of actuarial liabilities. The Company prices its products to cover the expected cost of taxes.
Policyholder dividends, experience rating refunds, and other adjustable policy elements	The best estimate projections for policyholder dividends and experience rating refunds, and other adjustable elements of policy benefits are determined to be consistent with management's expectation of how these elements will be managed should experience emerge consistently with the best estimate assumptions used for mortality and morbidity, investment returns, rates of policy termination, operating expenses and taxes.	The Company monitors policy experience and adjusts policy benefits and other adjustable elements to reflect this experience. Policyholder dividends are reviewed annually for all businesses under a framework of Board-approved policyholder dividend policies.
Foreign currency	Foreign currency risk results from a mismatch of the currency of liabilities and the currency of the assets designated to support these obligations. Where a currency mismatch exists, the assumed rate of return on the assets supporting the liabilities is reduced to reflect the potential for adverse movements in foreign exchange rates.	The Company generally matches the currency of its assets with the currency of the liabilities they support, with the objective of mitigating the risk of loss arising from movements in currency exchange rates.

The Company reviews actuarial methods and assumptions on an annual basis. If changes are made to assumptions (refer to note 7(h)), the full impact is recognized in income immediately.

(e) Sensitivity of insurance contract liabilities to changes in non-economic assumptions

The sensitivity of net income attributed to shareholders to changes in non-economic assumptions underlying insurance contract liabilities is shown below, assuming a simultaneous change in the assumption across all business units. The sensitivity of net income attributed to shareholders to a deterioration or improvement in non-economic assumptions for Long-Term Care ("LTC") as at December 31, 2018 is also shown below.

In practice, experience for each assumption will frequently vary by geographic market and business and assumption updates are made on a business/geographic specific basis. Actual results can differ materially from these estimates for a variety of reasons including the interaction among these factors when more than one changes; changes in actuarial and investment return and future investment activity assumptions; changes in business mix, effective tax rates and other market factors; and the general limitations of internal models.

Potential impact on net income attributed to shareholders arising from changes to non-economic assumptions⁽¹⁾

As at December 31,	Decrease in net income attributed to shareholders	
	2018	2017
Policy related assumptions		
2% adverse change in future mortality rates ^{(2),(4)}		
Products where an increase in rates increases insurance contract liabilities	\$ (500)	\$ (400)
Products where a decrease in rates increases insurance contract liabilities	(500)	(500)
5% adverse change in future morbidity rates (incidence and termination) ^{(3),(4),(5)}	(4,800)	(5,100)
10% adverse change in future policy termination rates ⁽⁴⁾	(2,200)	(2,100)
5% increase in future expense levels	(600)	(500)

⁽¹⁾ The participating policy funds are largely self-supporting and generate no material impact on net income attributed to shareholders as a result of changes in non-economic assumptions. Experience gains or losses would generally result in changes to future dividends, with no direct impact to shareholders.

⁽²⁾ An increase in mortality rates will generally increase policy liabilities for life insurance contracts whereas a decrease in mortality rates will generally increase policy liabilities for policies with longevity risk such as payout annuities.

⁽³⁾ No amounts related to morbidity risk are included for policies where the policy liability provides only for claims costs expected over a short period, generally less than one year, such as Group Life and Health.

⁽⁴⁾ The impacts of the adverse sensitivities on LTC for morbidity, mortality and lapse do not assume any partial offsets from the Company's ability to contractually raise premium rates in such events, subject to state regulatory approval. In practice, the Company would plan to file for rate increases equal to the amount of deterioration resulting from the sensitivity.

⁽⁵⁾ This includes a 5% deterioration in incidence rates and 5% deterioration in claim termination rates.

Potential impact on net income attributed to shareholders arising from changes to non-economic assumptions for Long-Term Care included in the above table^{(1),(2)}

As at December 31, 2018	Decrease in net income attributed to shareholders
Policy related assumptions	
2% adverse change in future mortality rates	\$ (200)
5% adverse change in future morbidity incidence rates	(1,700)
5% adverse change in future morbidity claims termination rates	(2,800)
10% adverse change in future policy termination rates	(400)
5% increase in future expense levels	(100)

⁽¹⁾ The impacts of the adverse sensitivities on LTC for morbidity, mortality and lapse do not assume any partial offsets from the Company's ability to contractually raise premium rates in such events, subject to state regulatory approval. In practice, the Company would plan to file for rate increases equal to the amount of deterioration resulting from the sensitivities.

⁽²⁾ The impact of favourable changes to all the sensitivities is relatively symmetrical.

(f) Provision for adverse deviation assumptions

The assumptions made in establishing insurance contract liabilities reflect expected best estimates of future experience. To recognize the uncertainty in these best estimate assumptions, to allow for possible misestimation of and deterioration in experience and to provide a greater degree of assurance that the insurance contract liabilities are adequate to pay future benefits, the Appointed Actuary is required to include a margin in each assumption.

Margins are released into future earnings as the policy is released from risk. Margins for interest rate risk are included by testing a number of scenarios of future interest rates. The margin can be established by testing a limited number of scenarios, some of which are prescribed by the Canadian Actuarial Standards of Practice, and determining the liability based on the worst outcome. Alternatively, the margin can be set by testing many scenarios, which are developed according to actuarial guidance. Under this approach, the liability would be the average of the outcomes above a percentile in the range prescribed by the Canadian Actuarial Standards of Practice.

Specific guidance is also provided for other risks such as market, credit, mortality and morbidity risks. For other risks which are not specifically addressed by the Canadian Institute of Actuaries, a range is provided of five per cent to 20 per cent of the expected experience assumption. The Company uses assumptions within the permissible ranges, with the determination of the level set considering the risk profile of the business. On occasion, in specific circumstances for additional prudence, a margin may exceed the high end of the range, which is permissible under the Canadian Actuarial Standards of Practice. This additional margin would be released if the specific circumstances which led to it being established were to change.

Each margin is reviewed annually for continued appropriateness.

(g) Change in insurance contract liabilities

The change in insurance contract liabilities was a result of the following business activities and changes in actuarial estimates.

	Net actuarial liabilities	Other insurance contract liabilities ⁽¹⁾	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
For the year ended December 31, 2018					
Balance, January 1	\$ 263,091	\$ 11,155	\$ 274,246	\$ 30,359	\$ 304,605
New policies ⁽²⁾	3,269	–	3,269	388	3,657
Normal in-force movement ⁽²⁾	2,044	985	3,029	(1,150)	1,879
Changes in methods and assumptions ⁽²⁾	(173)	(1)	(174)	(608)	(782)
Impact of annuity coinsurance transactions	(11,156)	–	(11,156)	11,156	–
Impact of changes in foreign exchange rates	15,686	829	16,515	2,780	19,295
Balance, December 31	\$ 272,761	\$ 12,968	\$ 285,729	\$ 42,925	\$ 328,654

	Net actuarial liabilities	Other insurance contract liabilities ⁽¹⁾	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
For the year ended December 31, 2017					
Balance, January 1	\$ 251,738	\$ 10,815	\$ 262,553	\$ 34,952	\$ 297,505
New policies ⁽³⁾	3,545	–	3,545	441	3,986
Normal in-force movement ⁽³⁾	15,192	930	16,122	(3,097)	13,025
Changes in methods and assumptions ⁽³⁾	305	(28)	277	47	324
Impact of U.S. Tax Reform ^{(3),(4)}	2,246	–	2,246	–	2,246
Increase due to decision to change the portfolio asset mix supporting legacy businesses ^{(3),(5)}	1,340	–	1,340	43	1,383
Impact of changes in foreign exchange rates	(11,275)	(562)	(11,837)	(2,027)	(13,864)
Balance, December 31	\$ 263,091	\$ 11,155	\$ 274,246	\$ 30,359	\$ 304,605

- (1) Other insurance contract liabilities are comprised of benefits payable and provision for unreported claims and policyholder amounts on deposit.
- (2) In 2018, the \$2,907 increase reported as the change in insurance contract liabilities on the Consolidated Statements of Income primarily consists of changes due to normal in-force movement, new policies and changes in methods and assumptions. These three items in the gross insurance contract liabilities were netted off by an increase of \$4,754, of which \$3,632 is included in the Consolidated Statements of Income increase in insurance contract liabilities and \$1,122 is included in gross claims and benefits. The Consolidated Statements of Income change in insurance contract liabilities also includes the change in embedded derivatives associated with insurance contracts. The Company finalized its estimate of U.S. Tax reform which resulted in a \$196 pre-tax (\$154 post-tax) increase in insurance contract liabilities, refer to note 5.
- (3) In 2017, the \$20,023 increase reported as the change in insurance contract liabilities on the Consolidated Statements of Income primarily consists of changes due to normal in-force movement, new policies, changes in methods and assumptions, the impact of U.S. Tax Reform and the increase due to the decision to change the portfolio asset mix supporting legacy businesses. These five items in the gross insurance contract liabilities were netted off by an increase of \$20,964, of which \$20,212 is included in the Consolidated Statements of Income increase in insurance contract liabilities and \$752 is included in gross claims and benefits. The Consolidated Statements of Income change in insurance contract liabilities also includes the change in embedded derivatives associated with insurance contracts.
- (4) In 2017, the impact of U.S. Tax Reform, which includes the lowering of the U.S. corporate tax rate from 35% to 21% and limits on the tax deductibility of reserves, resulted in a \$2,246 pre-tax (\$1,774 post-tax) increase in policy liabilities due to the impact of temporary tax timing and permanent tax rate differences on the cash flows available to satisfy policyholder obligations. The \$472 deferred tax impact on this increase in policy liabilities, together with the impact of U.S. Tax Reform on the Company's deferred tax assets and liabilities is included in note 5.
- (5) In 2017, the decision to reduce the allocation to ALDA in the portfolio asset mix supporting the Company's North American legacy businesses resulted in an increase in policy liabilities due to the impact on future expected investment income on assets supporting the policies.

(h) Actuarial methods and assumptions

A comprehensive review of valuation assumptions and methods is performed annually. The review reduces the Company's exposure to uncertainty by ensuring assumptions for both asset and liability related risks remain appropriate. This is accomplished by monitoring experience and updating assumptions which represent a best estimate view of future experience, and margins that are appropriate for the risks assumed. While the assumptions selected represent the Company's current best estimates and assessment of risk, the ongoing monitoring of experience and the economic environment is likely to result in future changes to the valuation assumptions, which could be material.

Annual review 2018

The completion of the 2018 annual review of actuarial methods and assumptions resulted in a decrease in insurance contract liabilities of \$174, net of reinsurance, and a decrease in net income attributed to shareholders of \$51 post-tax.

	Change in insurance contract liabilities, net of reinsurance			Change in net income attributed to shareholders (post-tax)
	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	
For the year ended December 31, 2018				
Mortality and morbidity updates	\$ 319	\$ (192)	\$ 511	\$ (360)
Lapses and policyholder behaviour	287	—	287	(226)
Investment return assumptions	(96)	50	(146)	143
Other updates	(684)	(94)	(590)	392
Net impact	\$ (174)	\$ (236)	\$ 62	\$ (51)

Updates to mortality and morbidity assumptions

Mortality and morbidity updates resulted in a \$360 post-tax charge to net income attributed to shareholders.

The primary driver of the charge is related to updates to mortality and morbidity assumptions for the Company's structured settlement and term renewal business in Canada. A review of mortality assumptions for the Company's U.S. group pension annuity business and certain blocks of life insurance business resulted in a small charge to earnings, and other updates to mortality and morbidity assumptions led to a small net charge.

Updates to lapses and policyholder behaviour

Lapse and policyholder behaviour updates resulted in a \$226 post-tax charge to net income attributed to shareholders.

The primary driver of the charge is related to updated lapse and premium persistency rates for certain U.S. insurance product lines (\$252 post-tax charge). This included updates to universal life no-lapse guarantee business lapse assumptions to better reflect emerging experience, which showed a variation in lapses based on premium funding levels, partially offset by favourable lapse experience on several of the U.S. life insurance product lines.

Other updates to lapse and policyholder behaviour assumptions were made across several product lines to reflect recent experience.

Updates to investment return assumptions

Investment return assumption updates resulted in a \$143 post-tax gain to net income attributed to shareholders.

The Company updated its bond default rates to reflect recent experience, leading to a \$401 post-tax gain and updated the investment return assumptions for ALDA and public equities, specifically oil and gas, which led to a \$210 post-tax charge. Other refinements to the projections of investment returns resulted in a \$48 post-tax charge.

Other updates

Refinements to the projection of the tax and liability cashflows across multiple product lines led to a post-tax gain to net income attributed to shareholders of \$392. The refinements were primarily driven by the projection of tax cashflows as the Company reviewed the deductibility of certain reserves. In addition, the Company refined the projection of policyholder crediting rates for certain products.

Annual Review 2017

The quantification of the impact of the 2017 comprehensive review of valuation methods and assumptions is as of July 1, 2017 for all lines of business.

The 2017 full year review of actuarial methods and assumptions resulted in an increase in insurance and investment contract liabilities of \$277, net of reinsurance, and a decrease in net income attributed to shareholders of \$35 post-tax. These charges exclude the impacts of the U.S. Tax Reform and reducing the allocation to ALDA in the Company's portfolio asset mix. The charge to net income in the fourth quarter of 2017 for these two items was \$2.8 billion, which primarily related to the post-tax change in policy liabilities. Refer to notes 5 and 7(g) for further details.

	Change in insurance contract liabilities, net of reinsurance			Change in net income attributed to shareholders (post-tax)
	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	
For the year ended December 31, 2017				
Mortality and morbidity updates	\$ (254)	\$ 9	\$ (263)	\$ 299
Lapses and policyholder behaviour	1,019	–	1,019	(783)
Other updates				
ALDA and public equity investment return assumptions	1,296	5	1,291	(892)
Corporate spread assumptions	(515)	(1)	(514)	344
Refinements to liability and tax cash flows	(1,049)	–	(1,049)	696
Other	(220)	84	(304)	301
Net impact	\$ 277	\$ 97	\$ 180	\$ (35)

Updates to mortality and morbidity assumptions

Mortality and morbidity updates resulted in a \$299 benefit to net income attributed to shareholders.

The Company completed a detailed review of the mortality assumptions for its U.S. life insurance business which resulted in a \$384 charge to net income attributed to shareholders. Assumptions were increased, particularly at older ages, reflecting both industry and the Company's own experience.

Updates to actuarial standards related to future mortality improvement, and the review of mortality improvement assumptions globally, resulted in a \$264 benefit to net income attributed to shareholders primarily in Canada and Asia. The updated actuarial standards include a diversification benefit for the determination of margins for adverse deviation which recognizes the offsetting impact of longevity and mortality risk.

The Company completed a detailed review of mortality assumptions for its Canadian retail insurance business which resulted in a \$222 benefit to net income attributed to shareholders.

Other updates to mortality and morbidity assumptions led to a \$197 benefit to net income attributed to shareholders. These updates included a reduction in the margins for adverse deviation applied to morbidity assumptions for certain medical insurance products in Japan.

Updates to lapses and policyholder behaviour

Updates to lapses and policyholder behaviour assumptions resulted in a \$783 charge to net income attributed to shareholders.

In Canadian retail insurance, lapse assumptions were reduced for certain universal life products to reflect recent experience, leading to a \$315 charge to net income attributed to shareholders.

For Canadian segregated fund guaranteed minimum withdrawal benefit lapses, incidence and utilization assumptions were updated to reflect recent experience which led to a \$242 charge to net income attributed to shareholders.

Other updates to lapse and policyholder behaviour assumptions were made across several product lines including a reduction in lapse assumptions for the Company's whole life insurance products in Japan, leading to a \$226 charge to net income attributed to shareholders.

Other updates

Other updates resulted in a \$449 benefit to net income attributed to shareholders.

The Company reviewed its investment return assumptions for ALDA and public equities, which in aggregate led to a reduction in return assumptions and a \$892 charge to net income attributed to shareholders. The Company also reviewed future corporate spread assumptions, which led to a \$344 benefit to net income attributed to shareholders.

Refinements to the projection of the Company's liability and tax cash flows in the U.S. resulted in a \$696 benefit to net income attributed to shareholders. These changes included refinements to the projection of policyholder crediting rates for certain universal life insurance products.

Other refinements resulted in a \$301 benefit to net income attributed to shareholders. These changes included a review of provisions for reinsurance counterparty credit risk and several other refinements to the projection of both the Company's asset and liability cash flows.

(i) Insurance contracts contractual obligations

Insurance contracts give rise to obligations fixed by agreement. As at December 31, 2018, the Company's contractual obligations and commitments relating to insurance contracts are as follows.

Payments due by period	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Insurance contract liabilities ⁽¹⁾	\$ 9,327	\$ 10,863	\$ 17,994	\$ 750,238	\$ 788,422

⁽¹⁾ Insurance contract liability cash flows include estimates related to the timing and payment of death and disability claims, policy surrenders, policy maturities, annuity payments, minimum guarantees on segregated fund products, policyholder dividends, commissions and premium taxes offset by contractual future premiums on in-force contracts. These estimated cash flows are based on the best estimate assumptions used in the determination of insurance contract liabilities. These amounts are undiscounted and reflect recoveries from reinsurance agreements. Due to the use of assumptions, actual cash flows may differ from these estimates. Cash flows include embedded derivatives measured separately at fair value.

(j) Gross claims and benefits

The following table presents a breakdown of gross claims and benefits.

For the years ended December 31,	2018	2017
Death, disability and other claims	\$ 15,174	\$ 14,871
Maturity and surrender benefits	7,722	6,302
Annuity payments	4,262	4,470
Policyholder dividends and experience rating refunds	1,809	1,085
Net transfers from segregated funds	(1,089)	(1,734)
Total	\$ 27,878	\$ 24,994

(k) Annuity coinsurance transactions

On September 26, 2018, the Company entered into coinsurance agreements with Reinsurance Group of America ("RGA") to reinsure a block of legacy U.S. individual pay-out annuities business from John Hancock Life Insurance Company (U.S.A.) ("JHUSA") and John Hancock Life Insurance Company of New York ("JHNY"). Under the terms of the agreements, the Company will maintain responsibility for servicing the policies.

The JHUSA transaction closed with an effective date of July 1, 2018 with a 100% quota share. The transaction was structured such that the Company ceded policyholder contract liabilities and transferred related invested assets backing these liabilities. The Company recorded an after-tax loss of \$74 at the inception of the agreement, consisting of ceded premiums of \$3.7 billion and an increase of reinsurance assets of \$3.6 billion on the Consolidated Statements of Income.

On October 31, 2018, the Company entered into coinsurance agreements with Jackson National Life Insurance Company ("Jackson"), a wholly-owned subsidiary of Prudential plc, to reinsure a block of legacy U.S. group pay-out annuities business from JHUSA and JHNY. Under the terms of the agreements, the Company will maintain responsibility for servicing the policies.

The JHUSA transaction closed with an effective date of October 1, 2018 with a 100% quota share. The transaction was structured such that the Company ceded policyholder contract liabilities and transferred related invested assets backing these liabilities. The Company recorded an after-tax gain of \$142 at the inception of the agreement, consisting of ceded premiums of \$7.0 billion and an increase of reinsurance assets of \$7.5 billion on the Consolidated Statements of Income.

The JHNY transaction with Jackson is expected to close separately in the first quarter of 2019. The JHNY transaction with RGA closed on February 7, 2019. These transactions are expected to result in an after-tax gain of approximately \$80.

Note 8 Investment Contract Liabilities

Investment contract liabilities are contractual obligations that do not contain significant insurance risk. Those contracts are measured either at fair value or at amortized cost.

(a) Investment contract liabilities measured at fair value

Investment contract liabilities measured at fair value include certain investment savings and pension products sold primarily in Hong Kong and mainland China. The following table presents the movement in investment contract liabilities measured at fair value during the year.

For the years ended December 31,	2018	2017
Balance, January 1	\$ 639	\$ 631
New policies	96	50
Changes in market conditions	76	76
Redemptions, surrenders and maturities	(86)	(72)
Impact of changes in foreign exchange rates	57	(46)
Balance, December 31	\$ 782	\$ 639

(b) Investment contract liabilities measured at amortized cost

Investment contract liabilities measured at amortized cost include several fixed annuity products sold in Canada and U.S. fixed annuity products that provide guaranteed income payments for a contractually determined period and are not contingent on survivorship.

Carrying value and fair value of investment contract liabilities measured at amortized cost.

	2018		2017	
	Amortized cost, gross of reinsurance ceded ⁽¹⁾	Fair value	Amortized cost, gross of reinsurance ceded ⁽¹⁾	Fair value
As at December 31,				
U.S. fixed annuity products	\$ 1,357	\$ 1,449	\$ 1,282	\$ 1,433
Canadian fixed annuity products	1,126	1,269	1,205	1,354
Investment contract liabilities	\$ 2,483	\$ 2,718	\$ 2,487	\$ 2,787

⁽¹⁾ During the year, investment contract liabilities with the carrying value and fair value of \$128 and \$130, respectively (2017 – \$nil and \$nil, respectively), were reinsured by the Company. As at December 31, 2018, the net carrying value and fair value of investment contracts liabilities were \$2,355 and \$2,588, respectively.

The changes in investment contract liabilities measured at amortized cost was a result of the following business activities.

For the years ended December 31,	2018	2017
Balance, January 1	\$ 2,487	\$ 2,644
Policy deposits	6	68
Interest	82	100
Withdrawals	(201)	(232)
Fees	(1)	(1)
Other	–	(1)
Impact of changes in foreign exchange rates	110	(91)
Balance, December 31	\$ 2,483	\$ 2,487

Carrying value of fixed annuity products is amortized at a rate that exactly discounts the projected actual cash flows to the net carrying amount of the liability at the date of issue.

Fair value of fixed annuity products is determined by projecting cash flows according to the contract terms and discounting the cash flows at current market rates adjusted for the Company's own credit standing. As at December 31, 2018 and 2017, all investment contracts were categorized in Level 2 of the fair value hierarchy.

(c) Investment contracts contractual obligations

As at December 31, 2018, the Company's contractual obligations and commitments relating to the investment contracts are as follows.

Payments due by period	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Investment contract liabilities ⁽¹⁾	\$ 193	\$ 492	\$ 476	\$ 4,312	\$ 5,473

⁽¹⁾ Due to the nature of the products, the timing of net cash flows may be before contract maturity. Cash flows are undiscounted.

Note 9 Risk Management

The Company's policies and procedures for managing risk related to financial instruments are presented in the "Risk Management" section of the Company's MD&A for the year ended December 31, 2018. Specifically, these disclosures are included in "Market Risk" and "Liquidity Risk" in that section. These disclosures are in accordance with IFRS 7 "Financial Instruments: Disclosures" and therefore, only the shaded text and tables in the "Risk Management" section form an integral part of these Consolidated Financial Statements.

(a) Credit risk

Credit risk is the risk of loss due to inability or unwillingness of a borrower, or counterparty, to fulfill its payment obligations.

Worsening regional and global economic conditions, segment or industry sector challenges, or company specific factors could result in defaults or downgrades and could lead to increased provisions or impairments related to the Company's general fund invested assets, derivative financial instruments and reinsurance assets and an increase in provisions for future credit impairments that are included in actuarial liabilities.

The Company's exposure to credit risk is managed through risk management policies and procedures which include a defined credit evaluation and adjudication process, delegated credit approval authorities and established exposure limits by borrower, corporate connection, credit rating, industry and geographic region. The Company measures derivative counterparty exposure as net potential credit exposure, which takes into consideration mark-to-market values of all transactions with each counterparty, net of any collateral held, and an allowance to reflect future potential exposure. Reinsurance counterparty exposure is measured reflecting the level of ceded liabilities.

The Company also ensures where warranted, that mortgages, private placements and loans to Bank clients are secured by collateral, the nature of which depends on the credit risk of the counterparty.

An allowance for losses on loans is established when a loan becomes impaired. Allowances for loan losses are calculated to reduce the carrying value of the loans to estimated net realizable value. The establishment of such allowances takes into consideration normal historical credit loss levels and future expectations, with an allowance for adverse deviations. In addition, policy liabilities include general provisions for credit losses from future asset impairments. Impairments are identified through regular monitoring of all credit related exposures, considering such information as general market conditions, industry and borrower specific credit events and any other relevant trends or conditions. Allowances for losses on reinsurance contracts are established when a reinsurance counterparty becomes unable or unwilling to fulfill its contractual obligations. The allowance for loss is based on current recoverable amounts and ceded policy liabilities.

Credit risk associated with derivative counterparties is discussed in note 9(d) and credit risk associated with reinsurance counterparties is discussed in note 9(i).

Credit exposure

The following table presents the gross carrying amount of financial instruments subject to credit exposure, without considering any collateral held or other credit enhancements.

As at December 31,	2018	2017
Debt securities		
FVTPL	\$ 154,737	\$ 147,024
AFS	30,857	26,976
Mortgages	48,363	44,742
Private placements	35,754	32,132
Policy loans	6,446	5,808
Loans to Bank clients	1,793	1,737
Derivative assets	13,703	15,569
Accrued investment income	2,427	2,182
Reinsurance assets	43,053	30,359
Other financial assets	4,800	5,253
Total	\$ 341,933	\$ 311,782

As at December 31, 2018, 99% (2017-99%) of debt securities were investment grade-rated with ratings ranging between AAA to BBB.

Credit quality

Credit quality of commercial mortgages and private placements is assessed at least annually by using an internal rating based on regular monitoring of credit-related exposures, considering both qualitative and quantitative factors.

A provision is recorded when the internal risk ratings indicate that a loss represents the most likely outcome. These assets are designated as non-accrual and an allowance is established based on an analysis of the security and repayment sources.

Credit quality of commercial mortgages and private placements.

As at December 31, 2018	AAA	AA	A	BBB	BB	B and lower	Total
Commercial mortgages							
Retail	\$ 82	\$ 1,524	\$ 4,459	\$ 2,227	\$ 11	\$ 74	\$ 8,377
Office	56	1,495	5,454	1,650	45	6	8,706
Multi-family residential	613	1,427	2,407	839	37	–	5,323
Industrial	36	366	1,953	339	120	–	2,814
Other	289	334	1,167	1,191	–	14	2,995
Total commercial mortgages	1,076	5,146	15,440	6,246	213	94	28,215
Agricultural mortgages	–	163	–	389	–	–	552
Private placements	1,143	4,968	13,304	14,055	733	1,551	35,754
Total	\$ 2,219	\$ 10,277	\$ 28,744	\$ 20,690	\$ 946	\$ 1,645	\$ 64,521

As at December 31, 2017	AAA	AA	A	BBB	BB	B and lower	Total
Commercial mortgages							
Retail	\$ 110	\$ 1,517	\$ 4,363	\$ 2,050	\$ 44	\$ 57	\$ 8,141
Office	57	1,272	4,635	1,647	70	28	7,709
Multi-family residential	523	1,395	1,805	726	–	–	4,449
Industrial	33	386	1,542	477	145	–	2,583
Other	362	331	1,012	973	14	–	2,692
Total commercial mortgages	1,085	4,901	13,357	5,873	273	85	25,574
Agricultural mortgages	–	159	–	405	25	–	589
Private placements	1,038	4,246	11,978	13,160	717	993	32,132
Total	\$ 2,123	\$ 9,306	\$ 25,335	\$ 19,438	\$ 1,015	\$ 1,078	\$ 58,295

Credit quality of residential mortgages and loans to Bank clients is assessed at least annually with the loan being performing or non-performing as the key credit quality indicator.

Full or partial write-offs of loans are recorded when management believes that there is no realistic prospect of full recovery. Write-offs, net of recoveries, are deducted from the allowance for credit losses. All impairments are captured in the allowance for credit losses.

Credit quality of residential mortgages and loans to Bank clients.

As at December 31,	2018 ⁽¹⁾			2017		
	Insured	Uninsured	Total	Insured	Uninsured	Total
Residential mortgages						
Performing	\$ 6,854	\$ 12,696	\$ 19,550	\$ 7,256	\$ 11,310	\$ 18,566
Non-performing	19	27	46	4	9	13
Loans to Bank clients						
Performing	n/a	1,787	1,787	n/a	1,734	1,734
Non-performing	n/a	6	6	n/a	3	3
Total	\$ 6,873	\$ 14,516	\$ 21,389	\$ 7,260	\$ 13,056	\$ 20,316

⁽¹⁾ Non-performing refers to assets that are 90 days or more past due.

The carrying value of government-insured mortgages was 15% of the total mortgage portfolio as at December 31, 2018 (2017 – 17%). Most of these insured mortgages are residential loans as classified in the table above.

Past due or credit impaired financial assets

The Company provides for credit risk by establishing allowances against the carrying value of impaired loans and recognizing impairment losses on AFS debt securities. In addition, the Company reports as impairment certain declines in the fair value of debt securities designated as FVTPL which it deems represent an impairment.

Past due but not impaired and impaired financial assets

As at December 31, 2018	Past due but not impaired			Total impaired
	Less than 90 days	90 days and greater	Total	
Debt securities				
FVTPL	\$ 14	\$ –	\$ 14	\$ 39
AFS	–	2	2	1
Private placements	15	–	15	18
Mortgages and loans to Bank clients	70	–	70	120
Other financial assets	77	26	103	1
Total	\$ 176	\$ 28	\$ 204	\$ 179

As at December 31, 2017	Past due but not impaired			Total impaired
	Less than 90 days	90 days and greater	Total	
Debt securities				
FVTPL	\$ –	\$ –	\$ –	\$ 45
AFS	104	2	106	1
Private placements	363	–	363	40
Mortgages and loans to Bank clients	76	16	92	86
Other financial assets	46	26	72	1
Total	\$ 589	\$ 44	\$ 633	\$ 173

Impaired loans

As at December 31, 2018	Gross carrying value	Allowances for loan losses	Net carrying value
Private placements	\$ 61	\$ 43	\$ 18
Mortgages and loans to Bank clients	172	52	120
Total	\$ 233	\$ 95	\$ 138

As at December 31, 2017	Gross carrying value	Allowances for loan losses	Net carrying value
Private placements	\$ 79	\$ 39	\$ 40
Mortgages and loans to Bank clients	132	46	86
Total	\$ 211	\$ 85	\$ 126

Allowance for loan losses

For the years ended December 31,	2018			2017		
	Private placements	Mortgages and loans to Bank clients	Total	Private placements	Mortgages and loans to Bank clients	Total
Balance, January 1	\$ 39	\$ 46	\$ 85	\$ 92	\$ 26	\$ 118
Provisions	37	18	55	2	33	35
Recoveries	(27)	(9)	(36)	(12)	(1)	(13)
Write-offs ⁽¹⁾	(6)	(3)	(9)	(43)	(12)	(55)
Balance, December 31	\$ 43	\$ 52	\$ 95	\$ 39	\$ 46	\$ 85

⁽¹⁾ Includes disposals and impact of changes in foreign exchange rates.

(b) Securities lending, repurchase and reverse repurchase transactions

The Company engages in securities lending to generate fee income. Collateral exceeding the market value of the loaned securities is retained by the Company until the underlying security has been returned to the Company. The market value of the loaned securities is monitored daily and additional collateral is obtained or refunded as the market value of the underlying loaned securities fluctuates. As at December 31, 2018, the Company had loaned securities (which are included in invested assets) with a market value of \$1,518 (2017 – \$1,563). The Company holds collateral with a current market value that exceeds the value of securities lent in all cases.

The Company engages in reverse repurchase transactions to generate fee income, to take possession of securities to cover short positions in similar instruments and to meet short-term funding requirements. As at December 31, 2018, the Company had engaged

in reverse repurchase transactions of \$63 (2017 – \$230) which are recorded as short-term receivables. In addition, the Company had engaged in repurchase transactions of \$64 as at December 31, 2018 (2017 – \$228) which are recorded as payables.

(c) Credit default swaps

The Company replicates exposure to specific issuers by selling credit protection via credit default swaps (“CDSs”) to complement its cash debt securities investing. The Company does not write CDS protection more than its government bond holdings. A CDS is a derivative instrument representing an agreement between two parties to exchange the credit risk of a single specified entity or an index based on the credit risk of a group of entities (all commonly referred to as the “reference entity” or a portfolio of “reference entities”), in return for a periodic premium. CDS contracts typically have a five-year term.

The following table presents details of the credit default swap protection sold by type of contract and external agency rating for the underlying reference security.

As at December 31, 2018	Notional amount ⁽¹⁾	Fair value	Weighted average maturity (in years) ⁽²⁾
Single name CDSs⁽³⁾ – Corporate debt			
AA	\$ 25	\$ –	2
A	447	7	2
BBB	180	2	2
Total single name CDSs	\$ 652	\$ 9	2
Total CDS protection sold	\$ 652	\$ 9	2

As at December 31, 2017	Notional amount ⁽¹⁾	Fair value	Weighted average maturity (in years) ⁽²⁾
Single name CDSs⁽³⁾ – Corporate debt			
AAA	\$ 13	\$ –	1
AA	35	1	2
A	408	10	3
BBB	150	3	2
Total single name CDSs	\$ 606	\$ 14	3
Total CDS protection sold	\$ 606	\$ 14	3

⁽¹⁾ Notional amounts represent the maximum future payments the Company would have to pay its counterparties assuming a default of the underlying credit and zero recovery on the underlying issuer obligation.

⁽²⁾ The weighted average maturity of the CDS is weighted based on notional amounts.

⁽³⁾ Rating agency designations are based on S&P where available followed by Moody's, DBRS, and Fitch. If no rating is available from a rating agency, an internally developed rating is used.

The Company held no purchased credit protection as at December 31, 2018 and 2017.

(d) Derivatives

The Company's point-in-time exposure to losses related to credit risk of a derivative counterparty is limited to the amount of any net gains that may have accrued with a counterparty. Gross derivative counterparty exposure is measured as the total fair value (including accrued interest) of all outstanding contracts in a gain position excluding any offsetting contracts in a loss position and the impact of collateral on hand. The Company limits the risk of credit losses from derivative counterparties by: using investment grade counterparties; entering into master netting arrangements which permit the offsetting of contracts in a loss position in the case of a counterparty default; and entering into Credit Support Annex agreements, whereby collateral must be provided when the exposure exceeds a certain threshold. All contracts are held with counterparties rated BBB- or higher. As at December 31, 2018, the percentage of the Company's derivative exposure with counterparties rated AA- or higher was 19 per cent (2017 – 20 per cent). The Company's exposure to credit risk was mitigated by \$7,848 fair value of collateral held as security as at December 31, 2018 (2017 – \$10,138).

As at December 31, 2018, the largest single counterparty exposure, without considering the impact of master netting agreements or the benefit of collateral held, was \$2,269 (2017 – \$2,629). The net exposure to this counterparty, after considering master netting agreements and the fair value of collateral held, was \$nil (2017 – \$nil). As at December 31, 2018, the total maximum credit exposure related to derivatives across all counterparties, without considering the impact of master netting agreements and the benefit of collateral held, was \$14,320 (2017 – \$16,204).

(e) Offsetting financial assets and financial liabilities

Certain derivatives, securities lent and repurchase agreements have conditional offset rights. The Company does not offset these financial instruments in the Consolidated Statements of Financial Position, as the rights of offset are conditional.

In the case of derivatives, collateral is collected from and pledged to counterparties and clearing houses to manage credit risk exposure in accordance with Credit Support Annexes to swap agreements and clearing agreements. Under master netting agreements, the Company has a right of offset in the event of default, insolvency, bankruptcy or other early termination.

In the case of reverse repurchase and repurchase transactions, additional collateral may be collected from or pledged to counterparties to manage credit exposure according to bilateral reverse repurchase or repurchase agreements. In the event of default by a counterparty, the Company is entitled to liquidate the collateral held to offset against the same counterparty's obligation.

The following table presents the effect of conditional master netting and similar arrangements. Similar arrangements may include global master repurchase agreements, global master securities lending agreements, and any related rights to financial collateral.

	Related amounts not set off in the Consolidated Statements of Financial Position				
	Gross amounts of financial instruments ⁽¹⁾	Amounts subject to an enforceable master netting arrangement or similar agreements	Financial and cash collateral pledged (received) ⁽²⁾	Net amount including financing trusts ⁽³⁾	Net amounts excluding financing trusts
As at December 31, 2018					
Financial assets					
Derivative assets	\$ 14,320	\$ (6,644)	\$ (7,431)	\$ 245	\$ 245
Securities lending	1,518	–	(1,518)	–	–
Reverse repurchase agreements	63	(63)	–	–	–
Total financial assets	\$ 15,901	\$ (6,707)	\$ (8,949)	\$ 245	\$ 245
Financial liabilities					
Derivative liabilities	\$ (8,716)	\$ 6,644	\$ 1,868	\$ (204)	\$ (33)
Repurchase agreements	(64)	63	1	–	–
Total financial liabilities	\$ (8,780)	\$ 6,707	\$ 1,869	\$ (204)	\$ (33)

	Related amounts not set off in the Consolidated Statements of Financial Position				
	Gross amounts of financial instruments ⁽¹⁾	Amounts subject to an enforceable master netting arrangement or similar agreements	Financial and cash collateral pledged (received) ⁽²⁾	Net amount including financing trusts ⁽³⁾	Net amounts excluding financing trusts
As at December 31, 2017					
Financial assets					
Derivative assets	\$ 16,204	\$ (6,714)	\$ (9,395)	\$ 95	\$ 95
Securities lending	1,563	–	(1,563)	–	–
Reverse repurchase agreements	230	(46)	(184)	–	–
Total financial assets	\$ 17,997	\$ (6,760)	\$ (11,142)	\$ 95	\$ 95
Financial liabilities					
Derivative liabilities	\$ (8,649)	\$ 6,714	\$ 1,718	\$ (217)	\$ (30)
Repurchase agreements	(228)	46	182	–	–
Total financial liabilities	\$ (8,877)	\$ 6,760	\$ 1,900	\$ (217)	\$ (30)

⁽¹⁾ Financial assets and liabilities include accrued interest of \$621 and \$913, respectively (2017 – \$638 and \$827, respectively).

⁽²⁾ Financial and cash collateral exclude over-collateralization. As at December 31, 2018, the Company was over-collateralized on OTC derivative assets, OTC derivative liabilities, securities lending and reverse purchase agreements and repurchase agreements in the amounts of \$417, \$405, \$80 and \$nil, respectively (2017 – \$743, \$382, \$79 and \$nil, respectively). As at December 31, 2018, collateral pledged (received) does not include collateral-in-transit on OTC instruments or initial margin on exchange traded contracts or cleared contracts.

⁽³⁾ Includes derivative contracts entered between the Company and its financing trusts which it does not consolidate. The Company does not exchange collateral on derivative contracts entered with these trusts. Refer to note 17.

The Company has certain credit linked note assets and variable surplus note liabilities which have unconditional offset rights. Under the netting agreements, the Company has rights of offset including in the event of the Company's default, insolvency, or bankruptcy. These financial instruments are offset in the Consolidated Statements of Financial Position.

A credit linked note is a security that allows the issuer to transfer a specific credit risk to the buyer. A surplus note is a subordinated debt obligation that often qualifies as a surplus (the U.S. statutory equivalent of equity) by some U.S. state insurance regulators. Interest payments on surplus notes are made after all other contractual payments are made. The following table presents the effect of unconditional netting.

	Gross amounts of financial instruments	Amounts subject to an enforceable netting arrangement	Net amounts of financial instruments
As at December 31, 2018			
Credit linked note ⁽¹⁾	\$ 679	\$ (679)	\$ –
Variable surplus note	(679)	679	–

As at December 31, 2017	Gross amounts of financial instruments	Amounts subject to an enforceable netting arrangement	Net amounts of financial instruments
Credit linked note ⁽¹⁾	\$ 461	\$ (461)	\$ –
Variable surplus note	(461)	461	–

⁽¹⁾ In 2017, the Company entered into a twenty-year financing facility with a third party, agreeing to issue variable surplus notes in exchange for an equal amount of credit linked notes. These notes are held to support JHUSA excess reserves under U.S. National Association of Insurance Commissioners' Model Regulation XXX. In certain scenarios, the credit linked note will be drawn upon by the Company which will issue fixed surplus notes equal to the draw payment received. The third party has agreed to fund any such payment under the credit-linked notes in return for a fee. As at December 31, 2018, the Company had no fixed surplus notes outstanding.

(f) Risk concentrations

The Company defines enterprise-wide investment portfolio level targets and limits to ensure that portfolios are diversified across asset classes and individual investment risks. The Company monitors actual investment positions and risk exposures for concentration risk and reports its findings to the Executive Risk Committee and the Risk Committee of the Board of Directors.

As at December 31,	2018	2017
Debt securities and private placements rated as investment grade BBB or higher ⁽¹⁾	98%	98%
Government debt securities as a per cent of total debt securities	38%	39%
Government private placements as a per cent of total private placements	11%	10%
Highest exposure to a single non-government debt security and private placement issuer	\$ 1,013	\$ 1,044
Largest single issuer as a per cent of the total equity portfolio	2%	2%
Income producing commercial office properties (2018 – 55% of real estate, 2017 – 64%)	\$ 7,065	\$ 8,836
Largest concentration of mortgages and real estate ⁽²⁾ – Ontario Canada (2018 – 26%, 2017 – 25%)	\$ 16,092	\$ 14,779

⁽¹⁾ Investment grade debt securities and private placements include 41% rated A, 17% rated AA and 17% rated AAA (2017 – 42%, 16% and 17%) investments based on external ratings where available.

⁽²⁾ Mortgages and real estate investments are diversified geographically and by property type.

Debt securities and private placements portfolio by sector and industry.

As at December 31,	2018		2017	
	Carrying value	% of total	Carrying value	% of total
Government and agency	\$ 73,858	33	\$ 71,888	35
Utilities	41,929	19	40,568	20
Financial	31,340	14	27,923	13
Energy	17,685	8	16,428	8
Industrial	17,508	8	14,691	7
Consumer (non-cyclical)	16,483	7	14,009	7
Consumer (cyclical)	7,707	3	5,916	3
Securitized	3,300	2	3,577	2
Telecommunications	3,716	2	3,324	2
Basic materials	3,539	2	3,248	2
Technology	2,352	1	2,475	1
Media and internet	1,112	1	1,136	–
Diversified and miscellaneous	819	–	949	–
Total	\$ 221,348	100	\$ 206,132	100

(g) Insurance risk

Insurance risk is the risk of loss due to actual experience for mortality and morbidity claims, policyholder behaviour and expenses emerging differently than assumed when a product was designed and priced. A variety of assumptions are made related to these experience factors, for reinsurance costs, and for sales levels when products are designed and priced, as well as in the determination of policy liabilities. Assumptions for future claims are generally based on both Company and industry experience, and assumptions for future policyholder behaviour and expenses are generally based on Company experience. Such assumptions require significant professional judgment, and actual experience may be materially different than the assumptions made by the Company. Claims may be impacted unexpectedly by changes in the prevalence of diseases or illnesses, medical and technology advances, widespread lifestyle changes, natural disasters, large-scale man-made disasters and acts of terrorism. Policyholder behaviour including premium payment patterns, policy renewals, lapse rates and withdrawal and surrender activity are influenced by many factors including market and general economic conditions, and the availability and relative attractiveness of other products in the marketplace. Some reinsurance rates are not guaranteed and may be changed unexpectedly. Adjustments the Company seeks to make to Non-Guaranteed elements to reflect changing experience factors may be challenged by regulatory or legal action and the Company may be unable to implement them or may face delays in implementation.

The Company manages insurance risk through global policies, standards and best practices with respect to product design, pricing, underwriting and claim adjudication, and a global underwriting manual. Each business unit establishes underwriting policies and procedures, including criteria for approval of risks and claims adjudication policies and procedures. The current global life retention

limit is US\$30 for individual policies (US\$35 for survivorship life policies) and is shared across businesses. Lower limits are applied in some markets and jurisdictions. The Company aims to further reduce exposure to claims concentrations by applying geographical aggregate retention limits for certain covers. Enterprise-wide, the Company aims to reduce the likelihood of high aggregate claims by operating globally, insuring a wide range of unrelated risk events, and reinsuring some risk.

(h) Concentration risk

The geographic concentration of the Company's insurance and investment contract liabilities, including embedded derivatives, is shown below. The disclosure is based on the countries in which the business is written.

As at December 31, 2018	Gross liabilities	Reinsurance assets	Net liabilities
U.S. and Canada	\$ 246,255	\$ (42,634)	\$ 203,621
Asia and Other	85,830	(419)	85,411
Total	\$ 332,085	\$ (43,053)	\$ 289,032

As at December 31, 2017	Gross liabilities	Reinsurance assets	Net liabilities
U.S. and Canada	\$ 237,434	\$ (30,225)	\$ 207,209
Asia and Other	70,521	(134)	70,387
Total	\$ 307,955	\$ (30,359)	\$ 277,596

(i) Reinsurance risk

In the normal course of business, the Company limits the amount of loss on any one policy by reinsuring certain levels of risk with other insurers. In addition, the Company accepts reinsurance from other reinsurers. Reinsurance ceded does not discharge the Company's liability as the primary insurer. Failure of reinsurers to honour their obligations could result in losses to the Company; consequently, allowances are established for amounts deemed uncollectible. To minimize losses from reinsurer insolvency, the Company monitors the concentration of credit risk both geographically and with any one reinsurer. In addition, the Company selects reinsurers with high credit ratings.

As at December 31, 2018, the Company had \$43,053 (2017 – \$30,359) of reinsurance assets. Of this, 94 per cent (2017 – 92 per cent) were ceded to reinsurers with Standard and Poor's ratings of A- or above. The Company's exposure to credit risk was mitigated by \$24,435 fair value of collateral held as security as at December 31, 2018 (2017 – \$13,855). Net exposure after considering offsetting agreements and the benefit of the fair value of collateral held was \$18,618 as at December 31, 2018 (2017 – \$16,504).

Note 10 Long-Term Debt

(a) Carrying value of long-term debt instruments

As at December 31,	Issue date	Maturity date	Par value	2018	2017
4.70% Senior notes ^{(1),(3)}	June 23, 2016	June 23, 2046	US\$ 1,000	\$ 1,355	\$ 1,246
5.375% Senior notes ^{(2),(3)}	March 4, 2016	March 4, 2046	US\$ 750	1,010	928
3.527% Senior notes ^{(2),(3)}	December 2, 2016	December 2, 2026	US\$ 270	367	338
4.150% Senior notes ^{(2),(3)}	March 4, 2016	March 4, 2026	US\$ 1,000	1,356	1,246
4.90% Senior notes ^{(2),(3)}	September 17, 2010	September 17, 2020	US\$ 500	681	626
5.505% Medium-term notes ⁽⁴⁾	June 26, 2008	June 26, 2018	\$ 400	–	400
Total				\$ 4,769	\$ 4,784

⁽¹⁾ MFC may redeem the notes in whole, but not in part, on June 23, 2021 and thereafter on every June 23, at a redemption price equal to par, together with accrued and unpaid interest.

⁽²⁾ MFC may redeem the senior notes in whole or in part, at any time, at a redemption price equal to the greater of par and a price based on the yield of a corresponding U.S. Treasury bond plus a specified number of basis points. The specified number of basis points is as follows: 5.375% – 40 bps, 3.527% – 20 bps, 4.150% – 35 bps, and 4.90% – 35 bps.

⁽³⁾ These U.S. dollar senior notes have been designated as hedges of the Company's net investment in its U.S. operations which reduces the earnings volatility that would otherwise arise from the re-measurement of these senior notes into Canadian dollars.

⁽⁴⁾ On June 26, 2018, the 5.505% Medium term notes matured.

The cash amount of interest paid on long-term debt during the year ended December 31, 2018 was \$222 (2017 – \$324). Issue costs are amortized over the term of the debt.

(b) Fair value measurement

Fair value of a long-term debt instrument is determined using quoted market prices where available (Level 1). When quoted market prices are not available, fair value is determined with reference to quoted prices of a debt instrument with similar characteristics or estimated using discounted cash flows using observable market rates (Level 2).

Long-term debt is measured at amortized cost in the Consolidated Statements of Financial Position. As at December 31, 2018, the fair value of long-term debt was \$4,886 (2017 – \$5,186). Long-term debt was categorized in Level 2 of the fair value hierarchy (2017 – Level 2).

(c) Aggregate maturities of long-term debt

As at December 31,	2018	2017
Less than one year	\$ –	\$ 400
One to two years	681	–
Two to three years	–	626
Greater than five years	4,088	3,758
Total	\$ 4,769	\$ 4,784

Note 11 Capital Instruments

(a) Carrying value of capital instruments

As at December 31,	Issuance date	Earliest par redemption date	Maturity date	Par value	2018	2017
7.535% MFCT II Senior debenture notes ⁽¹⁾	July 10, 2009	December 31, 2019	December 31, 2108	\$ 1,000	\$ 1,000	\$ 1,000
JHFC Subordinated notes ⁽²⁾	December 14, 2006	n/a	December 15, 2036	\$ 650	647	647
4.061% MFC Subordinated notes ⁽³⁾	February 24, 2017	February 24, 2027	February 24, 2032	US\$ 750	1,017	935
3.00% MFC Subordinated notes ⁽⁴⁾	November 21, 2017	November 21, 2024	November 21, 2029	S\$ 500	498	467
3.049% MFC Subordinated debentures ⁽⁵⁾	August 18, 2017	August 20, 2024	August 20, 2029	\$ 750	747	746
3.317% MFC Subordinated debentures ⁽⁵⁾	May 9, 2018	May 9, 2023	May 9, 2028	\$ 600	597	–
3.181% MLI Subordinated debentures ⁽⁶⁾	November 20, 2015	November 22, 2022	November 22, 2027	\$ 1,000	997	996
3.85% MFC Subordinated notes ⁽⁴⁾	May 25, 2016	May 25, 2021	May 25, 2026	S\$ 500	499	467
2.389% MLI Subordinated debentures ⁽⁶⁾	June 1, 2015	January 5, 2021	January 5, 2026	\$ 350	349	349
2.10% MLI Subordinated debentures ⁽⁶⁾	March 10, 2015	June 1, 2020	June 1, 2025	\$ 750	749	748
2.64% MLI Subordinated debentures ⁽⁶⁾	December 1, 2014	January 15, 2020	January 15, 2025	\$ 500	500	499
2.811% MLI Subordinated debentures ⁽⁶⁾	February 21, 2014	February 21, 2019	February 21, 2024	\$ 500	500	499
7.375% JHUSA Surplus notes ⁽⁷⁾	February 25, 1994	n/a	February 15, 2024	US\$ 450	632	584
2.926% MLI Subordinated debentures ⁽⁸⁾	November 29, 2013	November 29, 2018	November 29, 2023	\$ 250	–	250
2.819% MLI Subordinated debentures ⁽⁸⁾	February 25, 2013	February 26, 2018	February 26, 2023	\$ 200	–	200
Total					\$ 8,732	\$ 8,387

⁽¹⁾ Issued by MLI to Manulife Financial Capital Trust II (MFCT II), a wholly owned unconsolidated related party to the Company. On the earliest par redemption date and on every fifth anniversary thereafter (each, a "Interest Reset Date"), the rate of interest will reset to equal the yield on 5-year Government of Canada bonds plus 5.2%. With regulatory approval, MLI may redeem the debentures, in whole or in part, on the earliest par redemption date and on any Interest Reset Date, at a redemption price equal to par, together with accrued and unpaid interest. The redemption price for the debentures redeemed on any day that is not an Interest Reset Date will be equal to the greater of par or the fair value of the debt based on the yield on uncalled Government of Canada bonds to the next Interest Reset Date plus (a) 1.0325% if the redemption date is on or after December 31, 2014, but prior to December 31, 2019, or (b) 2.065% if the redemption date is after December 31, 2019, together with accrued and unpaid interest. Refer to note 17.

⁽²⁾ Issued by Manulife Holdings (Delaware) LLC ("MHDL"), now John Hancock Financial Corporation ("JHFC"), a wholly owned subsidiary of MFC, to Manulife Finance (Delaware) LLC ("MFLC"), a subsidiary of Manulife Finance (Delaware) L.P. ("MFLP"). MFLP and its subsidiaries are wholly owned unconsolidated related parties to the Company. The note bears interest at a floating rate equal to the 90-day Bankers' Acceptance rate plus 0.72%. With regulatory approval, JHFC may redeem the note, in whole or in part, at any time, at par, together with accrued and unpaid interest. Refer to note 17.

⁽³⁾ On the earliest par redemption date, the interest rate will reset to equal the 5-Year US Dollar Mid-Swap Rate plus 1.647%. With regulatory approval, MFC may redeem the debentures, in whole, but not in part, on the earliest par redemption date, at a redemption price equal to par, together with accrued and unpaid interest.

⁽⁴⁾ On the earliest par redemption date, the interest rate will reset to equal the 5-year Singapore Dollar Swap Rate plus a specified number of basis points. The specified number of basis points is as follows: 3.00% – 83.2 bps, 3.85% – 197 bps. With regulatory approval, MFC may redeem the debentures, in whole, but not in part, on the earliest par redemption date and thereafter on each interest payment date, at a redemption price equal to par, together with accrued and unpaid interest.

⁽⁵⁾ Interest is fixed for the period up to the earliest par redemption date, thereafter, the interest rate will reset to a floating rate equal to the 90-day Bankers' Acceptance rate plus a specified number of basis points. The specified number of basis points is as follows: 3.049% – 105 bps, 3.317% – 78 bps. With regulatory approval, MFC may redeem the debentures, in whole or in part, on or after the earliest par redemption date, at a redemption price equal to par, together with accrued and unpaid interest.

⁽⁶⁾ Interest is fixed for the period up to the earliest par redemption date, thereafter the interest rate will reset to a floating rate equal to the 90-day Bankers' Acceptance rate plus a specified number of basis points. The specified number of basis points is as follows: 3.181% – 157 bps, 2.389% – 83 bps, 2.10% – 72 bps, 2.64% – 73 bps, 2.811% – 80 bps. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after the earliest par redemption date, at a redemption price equal to par, together with accrued and unpaid interest.

⁽⁷⁾ Issued by John Hancock Mutual Life Insurance Company, now John Hancock Life Insurance Company (U.S.A.). Any payment of interest or principal on the surplus notes requires prior approval from the Department of Insurance and Financial Services of the State of Michigan. The carrying value of the surplus notes reflects an unamortized fair value increment of US\$20 (2017 – US\$23), which arose as a result of the acquisition of John Hancock Financial Services, Inc. The amortization of the fair value adjustment is recorded in interest expense.

⁽⁸⁾ MLI redeemed in full the 2.926% and 2.819% subordinated debentures at par, on November 29, 2018 and February 26, 2018, respectively, the earliest par redemption dates.

(b) Fair value measurement

Fair value of capital instruments is determined using quoted market prices where available (Level 1). When quoted market prices are not available fair value is determined with reference to quoted prices of debt instruments with similar characteristics or estimated using discounted cash flows using observable market rates (Level 2).

Capital instruments are measured at amortized cost in the Consolidated Statements of Financial Position. As at December 31, 2018, the fair value of capital instruments was \$8,712 (2017 – \$8,636). Capital instruments were categorized in Level 2 of the fair value hierarchy (2017 – Level 2).

Note 12 Share Capital and Earnings Per Share

The authorized capital of MFC consists of:

- an unlimited number of common shares without nominal or par value; and
- an unlimited number of Class A, Class B and Class 1 preferred shares without nominal or par value, issuable in series.

(a) Preferred shares

The changes in issued and outstanding preferred shares are as follows.

	2018		2017	
	Number of shares (in millions)	Amount	Number of shares (in millions)	Amount
For the years ended December 31,				
Balance, January 1	146	\$ 3,577	146	\$ 3,577
Issued, Class 1 shares, Series 25 ⁽¹⁾	10	250	–	–
Issuance costs, net of tax	–	(5)	–	–
Balance, December 31	156	\$ 3,822	146	\$ 3,577

⁽¹⁾ On February 20, 2018, MFC issued 10 million of Non-Cumulative Rate Reset Class 1 Shares Series 25 at a price of \$25 per share for gross proceeds of \$250.

Additional information for the outstanding preferred shares as at December 31, 2018

As at December 31, 2018	Issue date	Annual dividend rate ⁽¹⁾	Earliest redemption date ⁽²⁾	Number of shares (in millions)	Face amount	Net amount ⁽³⁾
Class A preferred shares						
Series 2	February 18, 2005	4.65%	n/a	14	\$ 350	\$ 344
Series 3	January 3, 2006	4.50%	n/a	12	300	294
Class 1 preferred shares						
Series 3 ^{(4),(5)}	March 11, 2011	2.178%	June 19, 2021	6	158	155
Series 4	June 20, 2016	floating ⁽⁶⁾	n/a	2	42	41
Series 5 ^{(4),(5)}	December 6, 2011	3.891%	December 19, 2021	8	200	195
Series 7 ^{(4),(5)}	February 22, 2012	4.312%	March 19, 2022	10	250	244
Series 9 ^{(4),(5)}	May 24, 2012	4.351%	September 19, 2022	10	250	244
Series 11 ^{(4),(5),(7)}	December 4, 2012	4.731%	March 19, 2023	8	200	196
Series 13 ^{(4),(5),(8)}	June 21, 2013	4.414%	September 19, 2023	8	200	196
Series 15 ^{(4),(5)}	February 25, 2014	3.90%	June 19, 2019	8	200	195
Series 17 ^{(4),(5)}	August 15, 2014	3.90%	December 19, 2019	14	350	343
Series 19 ^{(4),(5)}	December 3, 2014	3.80%	March 19, 2020	10	250	246
Series 21 ^{(4),(5)}	February 25, 2016	5.60%	June 19, 2021	17	425	417
Series 23 ^{(4),(5)}	November 22, 2016	4.85%	March 19, 2022	19	475	467
Series 25 ^{(4),(5)}	February 20, 2018	4.70%	June 19, 2023	10	250	245
Total				156	\$ 3,900	\$ 3,822

⁽¹⁾ Holders of Class A and Class 1 preferred shares are entitled to receive non-cumulative preferential cash dividends on a quarterly basis, as and when declared by the Board of Directors.

⁽²⁾ Redemption of all preferred shares is subject to regulatory approval. MFC may redeem each series, in whole or in part, at par, on the earliest redemption date or every five years thereafter, with the exception of Class A Series 2, Class A Series 3 and Class 1 Series 4 preferred shares. Class A Series 2 and Series 3 preferred shares are past their respective earliest redemption date and MFC may redeem these shares, in whole or in part, at par at any time, subject to regulatory approval, as noted. MFC may redeem the Class 1 Series 4, in whole or in part, at any time, at \$25.00 per share if redeemed on June 19, 2021 and on June 19 every five years thereafter, or at \$25.50 per share if redeemed on any other date after June 19, 2016, subject to regulatory approval, as noted.

⁽³⁾ Net of after-tax issuance costs.

⁽⁴⁾ On the earliest redemption date and every five years thereafter, the annual dividend rate will be reset to the five-year Government of Canada bond yield plus a yield specified for each series. The specified yield for Class 1 shares is: Series 3 – 1.41%, Series 5 – 2.90%, Series 7 – 3.13%, Series 9 – 2.86%, Series 11 – 2.61%, Series 13 – 2.22%, Series 15 – 2.16%, Series 17 – 2.36%, Series 19 – 2.30%, Series 21 – 4.97%, Series 23 – 3.83% and Series 25 – 2.55%.

⁽⁵⁾ On the earliest redemption date and every five years thereafter, Class 1 preferred shares are convertible at the option of the holder into a new series that is one number higher than their existing series, and the holders are entitled to non-cumulative preferential cash dividends, payable quarterly if and when declared by the Board of Directors, at a rate equal to the three month Government of Canada Treasury bill yield plus the rate specified in footnote 4 above.

⁽⁶⁾ The floating dividend rate for the Class 1 Shares Series 4 equals the three-month Government of Canada Treasury bill yield plus 1.41%.

⁽⁷⁾ MFC did not exercise its right to redeem all or any of the outstanding Class 1 Shares Series 11 on March 19, 2018 (the earliest redemption date). Dividend rate for Class 1 Shares Series 11 was reset as specified in footnote 4 above to an annual fixed rate of 4.731% for a five-year period commencing on March 20, 2018.

⁽⁸⁾ MFC did not exercise its right to redeem all or any of the outstanding Class 1 Shares Series 13 on September 19, 2018 (the earliest redemption date). Dividend rate for Class 1 Shares Series 13 was reset as specified in footnote 4 above to an annual fixed rate of 4.414% for a five-year period commencing on September 20, 2018.

(b) Common shares

The changes in common shares issued and outstanding are as follows.

	2018		2017	
	Number of shares (in millions)	Amount	Number of shares (in millions)	Amount
For the years ended December 31,				
Balance, January 1	1,982	\$ 22,989	1,975	\$ 22,865
Repurchased for cancellation	(23)	(269)	—	—
Issued under dividend reinvestment plan	9	182	—	—
Issued on exercise of stock options and deferred share units	3	59	7	124
Total	1,971	\$ 22,961	1,982	\$ 22,989

Normal Course Issuer Bid

On November 12, 2018, the Company announced that the Toronto Stock Exchange approved a normal course issuer bid ("NCIB") permitting the purchase for cancellation of up to 40 million MFC common shares. Purchases under the NCIB commenced on November 14, 2018 and may continue until November 13, 2019, when the NCIB expires, or such earlier date as the Company completes its purchases. As at December 31, 2018, the Company had repurchased 23 million shares for \$478. Of this, \$269 was recorded in common shares and \$209 was recorded in retained earnings in the Consolidated Statements of Changes in Equity.

Dividend Reinvestment Plan

The Company offers a Dividend Reinvestment Program ("DRIP") whereby shareholders may elect to automatically reinvest dividends in the form of MFC common shares instead of receiving cash. The offering of the program and its terms of execution are subject to the Board of Directors' discretion. For the first three quarters of 2018, common shares in connection with DRIP were purchased on the open market with no applicable discount. For the dividend paid on December 19, 2018, the required common shares were purchased from treasury with a two per cent (2%) discount from the market price.

(c) Earnings per share

The following table presents basic and diluted earnings per common share of the Company.

For the years ended December 31,	2018	2017
Basic earnings per common share	\$2.34	\$0.98
Diluted earnings per common share	2.33	0.98

The following is a reconciliation of the denominator (number of shares) in the calculation of basic and diluted earnings per share.

For the years ended December 31,	2018	2017
Weighted average number of common shares (in millions)	1,983	1,978
Dilutive stock-based awards ⁽¹⁾ (in millions)	5	8
Weighted average number of diluted common shares (in millions)	1,988	1,986

⁽¹⁾ The dilutive effect of stock-based awards was calculated using the treasury stock method. This method calculates the number of incremental shares by assuming the outstanding stock-based awards are (i) exercised and (ii) then reduced by the number of shares assumed to be repurchased from the issuance proceeds, using the average market price of MFC common shares for the year. Excluded from the calculation was a weighted average of 7 million (2017 – 2 million) anti-dilutive stock-based awards.

(d) Quarterly dividend declaration subsequent to year end

On February 13, 2019, the Company's Board of Directors approved a quarterly dividend of \$0.25 per share on the common shares of MFC, payable on or after March 19, 2019 to shareholders of record at the close of business on February 27, 2019.

The Board also declared dividends on the following non-cumulative preferred shares, payable on or after March 19, 2019 to shareholders of record at the close of business on February 27, 2019.

Class A Shares Series 2 – \$0.29063 per share
Class A Shares Series 3 – \$0.28125 per share
Class 1 Shares Series 3 – \$0.136125 per share
Class 1 Shares Series 4 – \$0.193315 per share
Class 1 Shares Series 5 – \$0.243188 per share
Class 1 Shares Series 7 – \$0.2695 per share
Class 1 Shares Series 9 – \$0.271938 per share
Class 1 Shares Series 11 – \$0.295688 per share

Class 1 Shares Series 13 – \$0.275875 per share
Class 1 Shares Series 15 – \$0.24375 per share
Class 1 Shares Series 17 – \$0.24375 per share
Class 1 Shares Series 19 – \$0.2375 per share
Class 1 Shares Series 21 – \$0.35 per share
Class 1 Shares Series 23 – \$0.303125 per share
Class 1 Shares Series 25 – \$0.29375 per share

Note 13 Capital Management

(a) Capital management

The Company monitors and manages its consolidated capital in compliance with the Life Insurance Capital Adequacy Test ("LICAT") guideline, the new capital framework issued by the Office of the Superintendent of Financial Institutions ("OSFI") that became

effective on January 1, 2018. Under this new capital framework, the Company's consolidated capital resources, including available capital, surplus allowance, and eligible deposits, are measured against the base solvency buffer, which is the risk-based capital requirement determined in accordance with the guideline.

The Company's operating activities are mostly conducted within MLI and its subsidiaries.

MLI is also regulated by OSFI and is therefore subject to consolidated risk-based capital requirements using the OSFI LICAT framework.

The Company seeks to manage its capital with the objectives of:

- Operating with sufficient capital to be able to honour all commitments to its policyholders and creditors with a high degree of confidence;
- Retaining the ongoing confidence of regulators, policyholders, rating agencies, investors and other creditors in order to ensure access to capital markets; and
- Optimizing return on capital to meet shareholders' expectations subject to constraints and considerations of adequate levels of capital established to meet the first two objectives.

Capital is managed and monitored in accordance with the Capital Management Policy. The policy is reviewed and approved by the Board of Directors annually and is integrated with the Company's risk and financial management frameworks. It establishes guidelines regarding the quantity and quality of capital, internal capital mobility, and proactive management of ongoing and future capital requirements.

The capital management framework takes into account the requirements of the Company as a whole as well as the needs of each of the Company's subsidiaries. Internal capital targets are set above the regulatory requirements, and consider a number of factors, including expectations of regulators and rating agencies, results of sensitivity and stress testing and the Company's own risk assessments. The Company monitors against these internal targets and initiates actions appropriate to achieving its business objectives.

Consolidated capital, based on accounting standards, is presented in the table below for MFC. For regulatory reporting purposes, LICAT available capital is based on consolidated capital with adjustments for certain deductions, limits and restrictions, as mandated by the LICAT guideline.

Consolidated capital

As at December 31,	2018	2017
Total equity	\$ 47,151	\$ 42,163
Adjusted for AOCI loss on cash flow hedges	(127)	(109)
Total equity excluding AOCI on cash flow hedges	47,278	42,272
Qualifying capital instruments	8,732	8,387
Consolidated capital	\$ 56,010	\$ 50,659

(b) Restrictions on dividends and capital distributions

Dividends and capital distributions are restricted under the Insurance Company Act ("ICA"). These restrictions apply to both the Company and its primary operating subsidiary MLI. The ICA prohibits the declaration or payment of any dividend on shares of an insurance company if there are reasonable grounds for believing a company does not have adequate capital and adequate and appropriate forms of liquidity or the declaration or the payment of the dividend would cause the company to be in contravention of any regulation made under the ICA respecting the maintenance of adequate capital and adequate and appropriate forms of liquidity, or of any direction made to the company by OSFI. The ICA also requires an insurance company to notify OSFI of the declaration of a dividend at least 15 days prior to the date fixed for its payment. Similarly, the ICA prohibits the purchase for cancellation of any shares issued by an insurance company or the redemption of any redeemable shares or other similar capital transactions, if there are reasonable grounds for believing that the company does not have adequate capital and adequate and appropriate forms of liquidity or the payment would cause the company to be in contravention of any regulation made under the ICA respecting the maintenance of adequate capital and adequate and appropriate forms of liquidity, or any direction made to the company by OSFI. These latter transactions would require the prior approval of OSFI.

The ICA requires Canadian insurance companies to maintain adequate levels of capital at all times.

Since the Company is a holding company that conducts all of its operations through regulated insurance subsidiaries (or companies owned directly or indirectly by these subsidiaries), its ability to pay future dividends will depend on the receipt of sufficient funds from its regulated insurance subsidiaries. These subsidiaries are also subject to certain regulatory restrictions under laws in Canada, the United States and certain other countries that may limit their ability to pay dividends or make other upstream distributions.

The Company and MLI have covenanted for the benefit of holders of the outstanding Trust II Notes – Series I (the "Notes") that, if interest is not paid in full in cash on the Notes on any interest payment date or if MLI elects that holders of Notes invest interest

payable on the Notes on any interest payment date in a new series of Manufacturers Life Class 1 Shares, MLI will not declare or pay cash dividends on any MLI Public Preferred Shares (as defined below), if any are outstanding, and if no MLI Public Preferred Shares are outstanding, MFC will not declare or pay cash dividends on its Preferred Shares and Common Shares, in each case, until the sixth month following such deferral date. "MLI Public Preferred Shares" means, at any time, preferred shares of MLI which at that time: (a) have been issued to the public (excluding any preferred shares of MLI held beneficially by affiliates of MLI); (b) are listed on a recognized stock exchange; and (c) have an aggregate liquidation entitlement of at least \$200, however, if at any time, there is more than one class of MLI Public Preferred Shares outstanding, then the most senior class or classes of outstanding MLI Public Preferred Shares shall, for all purposes, be the MLI Public Preferred Shares.

Note 14 Revenue from Service Contracts

The Company provides investment management services, administrative services, distribution and related services to proprietary and third-party investment funds, retirement plans, group benefit plans and other arrangements. The Company also provides real estate management services to tenants of the Company's investment properties.

The Company's service contracts generally impose single performance obligations, each consisting of a series of similar related services for each customer.

The Company's performance obligations within service arrangements are generally satisfied over time as the customer simultaneously receives and consumes the benefits of the services rendered, measured using an output method. Fees typically include variable consideration and the related revenue is recognized to the extent that it is highly probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty is subsequently resolved.

Asset based fees vary with asset values of accounts under management, subject to market conditions and investor behaviors beyond the Company's control. Transaction processing and administrative fees vary with activity volume, also beyond the Company's control. Some fees, including distribution fees, are based on account balances and transaction volumes. Fees related to account balances and transaction volumes are measured daily. Real estate management service fees include fixed portions plus recovery of variable costs of services rendered to tenants. Fees related to services provided are generally recognized as services are rendered, which is when it becomes highly probable that no significant reversal of cumulative revenue recognized will occur. The Company has determined that its service contracts have no significant financing components as fees are collected monthly. The Company has no significant contract assets or contract liabilities.

The following tables present revenue from service contracts by service lines and reporting segments as disclosed in note 19.

For the year ended December 31, 2018	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Investment management and other related fees	\$ 328	\$ 149	\$ 521	\$ 2,805	\$ (236)	\$ 3,567
Transaction processing, administration, and service fees	226	854	17	1,939	–	3,036
Distribution fees and other	255	49	617	724	(30)	1,615
Total included in other revenue	809	1,052	1,155	5,468	(266)	8,218
Real estate management services reported in net investment income	31	160	147	–	10	348
Total	\$ 840	\$ 1,212	\$ 1,302	\$ 5,468	\$ (256)	\$ 8,566

For the year ended December 31, 2017	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Investment management and other related fees	\$ 351	\$ 137	\$ 569	\$ 2,397	\$ (232)	\$ 3,222
Transaction processing, administration, and service fees	206	871	17	1,978	3	3,075
Distribution fees and other	269	64	626	785	(42)	1,702
Total included in other revenue	826	1,072	1,212	5,160	(271)	7,999
Real estate management services reported in net investment income	22	161	156	–	5	344
Total	\$ 848	\$ 1,233	\$ 1,368	\$ 5,160	\$ (266)	\$ 8,343

Note 15 Stock-Based Compensation

(a) Stock options

The Company grants stock options under its Executive Stock Option Plan ("ESOP") to selected individuals. The options provide the holder the right to purchase MFC common shares at an exercise price equal to the higher of the prior day, prior five-day or prior ten-day average closing market price of the shares on the Toronto Stock Exchange on the date the options are granted. The options vest over a period not exceeding four years and expire not more than 10 years from the grant date. Effective with the 2015 grant, options may only be exercised after the fifth-year anniversary. A total of 73,600,000 common shares have been reserved for issuance under the ESOP.

Options outstanding

	2018		2017	
	Number of options (in millions)	Weighted average exercise price	Number of options (in millions)	Weighted average exercise price
For the years ended December 31,				
Outstanding, January 1	25	\$ 20.45	30	\$ 19.80
Granted	3	24.52	4	24.56
Exercised	(3)	17.77	(7)	16.03
Expired	(1)	37.35	(1)	39.47
Forfeited	(1)	21.24	(1)	20.86
Outstanding, December 31	23	\$ 20.29	25	\$ 20.45
Exercisable, December 31	9	\$ 18.08	12	\$ 19.93

	Options outstanding			Options exercisable		
	Number of options (in millions)	Weighted average exercise price	Weighted average remaining contractual life (in years)	Number of options (in millions)	Weighted average exercise price	Weighted average remaining contractual life (in years)
For the year ended December 31, 2018						
\$12.64 – \$20.99	11	\$ 17.27	4.00	7	\$ 17.06	2.09
\$21.00 – \$24.83	12	\$ 23.26	6.95	2	\$ 21.27	3.25
Total	23	\$ 20.29	5.49	9	\$ 18.08	2.37

The weighted average fair value of each option granted in 2018 has been estimated at \$4.97 (2017 – \$5.18) using the Black-Scholes option-pricing model. The pricing model uses the following assumptions for these options: risk-free interest rate of 2.00% (2017 – 1.25%), dividend yield of 3.25% (2017 – 3.00%), expected volatility of 28.0% (2017 – 29.5%) and expected life of 6.3 (2017 – 6.7) years. Expected volatility is estimated by evaluating a number of factors including historical volatility of the share price over multi-year periods.

Compensation expense related to stock options was \$9 for the year ended December 31, 2018 (2017 – \$16).

(b) Deferred share units

In 2000, the Company granted deferred share units (“DSUs”) to certain employees under the ESOP. These DSUs vest over a three-year period and each DSU entitles the holder to receive one common share on retirement or termination of employment. When dividends are paid on common shares, holders of DSUs are deemed to receive dividends at the same rate, payable in the form of additional DSUs. In 2018, nil DSUs were granted to employees under the ESOP (2017 – nil). The number of DSUs outstanding was 337,000 as at December 31, 2018 (2017 – 610,000).

In addition, for certain employees and pursuant to the Company’s deferred compensation program, the Company grants DSUs under the RSU Plan which entitle the holder to receive payment in cash equal to the value of the same number of common shares plus credited dividends on retirement or termination of employment. In 2018, the Company granted 55,000 DSUs to certain employees which vest after 34 months (2017 – 23,000). In 2018, 8,000 DSUs (2017 – nil) were granted to certain employees who elected to defer receipt of all or part of their annual bonus. These DSUs vested immediately. Also, in 2018, nil DSUs (2017 – 43,000) were granted to certain employees to defer payment of all or part of their Restricted Share Units (“RSUs”) and/or Performance Share Units (“PSUs”). These DSUs also vested immediately.

Under the Stock Plan for Non-Employee Directors, each eligible director may elect to receive his or her annual director’s retainer and fees in DSUs or common shares in lieu of cash. Upon termination of the Board service, an eligible director who has elected to receive DSUs will be entitled to receive cash equal to the value of the DSUs accumulated in his or her account, or at his or her direction, an equivalent number of common shares. A total of one million common shares have been reserved for issuance under this plan.

The fair value of 141,000 DSUs issued during the year was \$19.37 per unit, as at December 31, 2018 (2017 – 156,000 at \$26.22 per unit).

For the years ended December 31,	2018	2017
Number of DSUs (in thousands)		
Outstanding, January 1	2,645	2,682
Issued	141	156
Reinvested	98	88
Redeemed	(346)	(279)
Forfeitures and cancellations	–	(2)
Outstanding, December 31	2,538	2,645

Of the DSUs outstanding as at December 31, 2018, 337,000 (2017 – 610,000) entitle the holder to receive common shares, 1,151,000 (2017 – 1,103,000) entitle the holder to receive payment in cash and 1,050,000 (2017 – 932,000) entitle the holder to receive payment in cash or common shares, at the option of the holder.

Compensation expense related to DSUs was \$6 for the year ended December 31, 2018 (2017 – \$13).

The carrying and fair value of the DSUs liability as at December 31, 2018 was \$43 (2017 – \$53) and was included in other liabilities.

(c) Restricted share units and performance share units

For the year ended December 31, 2018, 5.5 million RSUs (2017 – 5.6 million) and 0.8 million PSUs (2017 – 1.0 million) were granted to certain eligible employees under MFC's Restricted Share Unit Plan. The fair value of the RSUs and PSUs granted during the year was \$19.37 per unit as at December 31, 2018 (2017 – \$26.22 per unit). Each RSU and PSU entitles the holder to receive payment equal to the market value of one common share, plus credited dividends, at the time of vesting, subject to any performance conditions.

RSUs granted in February 2018 will vest after 34 months and PSUs granted in February 2018 will vest after 36 months from their grant date and the related compensation expense is recognized over these periods, except where the employee is eligible to retire prior to a vesting date, in which case the cost is recognized over the period between the grant date and the date on which the employee is eligible to retire. Compensation expense related to RSUs and PSUs was \$111 and \$14, respectively, for the year ended December 31, 2018 (2017 – \$125 and \$21, respectively).

The carrying and fair value of the RSUs and PSUs liability as at December 31, 2018 was \$128 (2017 – \$228) and was included in other liabilities.

(d) Global share ownership plan

The Company's Global Share Ownership Plan allows qualifying employees to apply up to five per cent of their annual base earnings toward the purchase of common shares. The Company matches a percentage of the employee's eligible contributions up to a maximum amount. The Company's contributions vest immediately. All contributions are used to purchase common shares in the open market.

Note 16 Employee Future Benefits

The Company maintains defined contribution and defined benefit pension plans and other post-employment plans for employees and agents including registered (tax qualified) pension plans that are typically funded, as well as supplemental non-registered (non-qualified) pension plans for executives, retiree welfare plans and disability welfare plans that are typically not funded.

(a) Plan characteristics

To reduce the financial risk associated with final average pay defined benefit pension plans and retiree welfare plans, the Company has over time closed all these plans to new members and, in the case of pension plans, has replaced them with capital accumulation plans. The latter include defined benefit cash balance plans, 401(k) plans and/or defined contribution plans, depending on the country of employment. The result is that final average pay pension plans account for less than 50 per cent of the Company's global pension obligations and the number of employees who accrue these pensions declines each year.

During the year, the Company implemented a voluntary exit program, as part of its Canadian operations transformation, and a North American voluntary early retirement program. Combined, these two programs will result in the voluntary separation of 1,270 employees in Canada and 229 employees in the U.S. by the end of 2019. A curtailment loss of \$22 resulting from these programs was recorded in earnings during the 4th quarter of 2018. This loss represents the increase in net defined benefit liability due to the affected employees separating sooner than had previously been assumed.

All pension arrangements are governed by local pension committees or management, but significant plan changes require approval from the Company's Board of Directors.

The Company's funding policy for defined benefit pension plans is to make the minimum annual contributions required by regulations in the countries in which the plans are offered. Assumptions and methods prescribed for regulatory funding purposes typically differ from those used for accounting purposes.

The Company's remaining defined benefit pension and/or retiree welfare plans are in the U.S., Canada, Japan, and Taiwan (China). There are also disability welfare plans in the U.S. and Canada.

The largest defined benefit pension and retiree welfare plans are the primary plans for employees in the U.S. and Canada. These are the material plans that are discussed in the balance of this note. The Company measures its defined benefit obligations and fair value of plan assets for accounting purposes as at December 31 each year.

U.S. defined benefit pension and retiree welfare plans

The Company operates a qualified cash balance plan that is open to new members, a closed non-qualified cash balance plan, and a closed retiree welfare plan.

Actuarial valuations to determine the Company's minimum funding contributions for the qualified cash balance plan are required annually. Deficits revealed in the funding valuations must generally be funded over a period of up to seven years. It is expected that there will be no required funding for this plan in 2019. There are no plan assets set aside for the non-qualified cash balance plan.

The retiree welfare plan subsidizes the cost of life insurance and medical benefits. The majority of those who retired after 1991 receive a fixed-dollar subsidy from the Company based on service. The plan was closed to all employees hired after 2004. While assets have been set aside in a qualified trust to pay future retiree welfare benefits, this funding is optional. Retiree welfare benefits offered under the plan coordinate with the U.S. Medicare program to make optimal use of available federal financial support.

The qualified pension and retiree welfare plans are governed by the U.S. Benefits Committee, while the non-qualified pension plan is governed by the U.S. Non-Qualified Plans Subcommittee.

Canadian defined benefit pension and retiree welfare plans

The Company's defined benefit plans in Canada include two registered final average pay pension plans, a non-registered supplemental final average pay pension plan and a retiree welfare plan, all of which have been closed to new members.

Actuarial valuations to determine the Company's minimum funding contributions for the registered pension plans are required at least once every three years. Deficits revealed in the funding valuation must generally be funded over a period of ten years. For 2019, the required funding for these plans is expected to be \$12. The supplemental non-registered pension plan is not funded.

The retiree welfare plan subsidizes the cost of life insurance, medical and dental benefits. These subsidies are a fixed dollar amount for those who retired after April 30, 2013 and will be eliminated for those who retire after 2019. There are no assets set aside for this plan.

The registered pension plans are governed by Pension Committees, while the supplemental non-registered plan is governed by the Board of Directors. The retiree welfare plan is governed by management.

(b) Risks

In final average pay pension plans and retiree welfare plans, the Company generally bears the material risks which include interest rate, investment, longevity and health care cost inflation risks. In defined contribution plans, these risks are typically borne by the employee. In cash balance plans, the interest rate, investment and longevity risks are partially transferred to the employee.

Material sources of risk to the Company for all plans include:

- A decline in discount rates that increases the defined benefit obligations by more than the change in value of plan assets;
- Lower than expected rates of mortality; and
- For retiree welfare plans, higher than expected health care costs.

The Company has managed these risks through plan design and eligibility changes that have limited the size and growth of the defined benefit obligations. Investment risks for funded plans are managed through strategies aimed at improving the alignment between movements in the invested assets and movements in the obligations.

In the U.S., delegated committee representatives and management review the financial status of the qualified defined benefit pension plan at least monthly, and steps are taken in accordance with an established dynamic investment policy to reduce the risk in the plan as the funded status improves. As at December 31, 2018, the target asset allocation for the plan was 27% return-seeking assets and 73% liability-hedging assets.

In Canada, internal committees and management review the financial status of the registered defined benefit pension plans on at least a quarterly basis. As at December 31, 2018, the target asset allocation for the plans was 20% return-seeking assets and 80% liability-hedging assets.

(c) Pension and retiree welfare plans

For the years ended December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Changes in defined benefit obligation:				
Opening balance	\$ 4,706	\$ 4,767	\$ 665	\$ 682
Current service cost	42	48	–	1
Past service cost – amendments	8	–	–	–
Past service cost – curtailments	10	–	12	–
Interest cost	165	182	24	26
Plan participants' contributions	1	1	4	4
Actuarial losses (gains) due to:				
Experience	–	15	(7)	(9)
Demographic assumption changes	35	–	(1)	–
Economic assumption changes	(250)	214	(56)	41
Benefits paid	(304)	(315)	(45)	(45)
Impact of changes in foreign exchange rates	262	(206)	44	(35)
Defined benefit obligation, December 31	\$ 4,675	\$ 4,706	\$ 640	\$ 665

For the years ended December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Change in plan assets:				
Fair value of plan assets, opening balance	\$ 4,328	\$ 4,277	\$ 587	\$ 603
Interest income	153	164	21	23
Return on plan assets (excluding interest income)	(315)	312	(16)	30
Employer contributions	79	85	10	12
Plan participants' contributions	1	1	4	4
Benefits paid	(304)	(315)	(45)	(45)
Administration costs	(6)	(5)	(2)	(2)
Impact of changes in foreign exchange rates	254	(191)	51	(38)
Fair value of plan assets, December 31	\$ 4,190	\$ 4,328	\$ 610	\$ 587

(d) Amounts recognized in the Consolidated Statements of Financial Position

As at December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Development of net defined benefit liability				
Defined benefit obligation	\$ 4,675	\$ 4,706	\$ 640	\$ 665
Fair value of plan assets	4,190	4,328	610	587
Deficit	485	378	30	78
Effect of asset limit ⁽¹⁾	9	–	–	–
Deficit and net defined benefit liability	494	378	30	78
Deficit is comprised of:				
Funded or partially funded plans	(248)	(383)	(121)	(72)
Unfunded plans	742	761	151	150
Deficit and net defined benefit liability	\$ 494	\$ 378	\$ 30	\$ 78

⁽¹⁾ In 2018, the Company recognized an impairment of \$9 on the net defined benefit asset for one of its registered pension plans in Canada. This was due to the conversion of most plan benefits for future service from defined benefit to defined contribution which reduced the economic benefit that can be derived by the Company from the plan's surplus. For the other funded pension plans, the present value of the economic benefits available in the form of reductions in future contributions to the plans remains greater than the surplus that is expected to develop.

(e) Disaggregation of defined benefit obligation

As at December 31,	U.S. plans				Canadian plans			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
	2018	2017	2018	2017	2018	2017	2018	2017
Active members	\$ 621	\$ 592	\$ 32	\$ 34	\$ 332	\$ 393	\$ 22	\$ 20
Inactive and retired members	2,431	2,434	457	481	1,291	1,287	129	130
Total	\$ 3,052	\$ 3,026	\$ 489	\$ 515	\$ 1,623	\$ 1,680	\$ 151	\$ 150

(f) Fair value measurements

The major categories of plan assets and the actual per cent allocation to each category are as follows.

As at December 31, 2018	U.S. plans ⁽¹⁾				Canadian plans ⁽²⁾			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
	Fair value	% of total	Fair value	% of total	Fair value	% of total	Fair value	% of total
Cash and cash equivalents	\$ 26	1%	\$ 51	8%	\$ 19	1%	\$ –	–
Equity securities ⁽³⁾	500	17%	38	6%	269	20%	–	–
Debt securities	2,088	73%	514	85%	1,033	79%	–	–
Other investments ⁽⁴⁾	252	9%	7	1%	3	0%	–	–
Total	\$ 2,866	100%	\$ 610	100%	\$ 1,324	100%	\$ –	–

As at December 31, 2017	U.S. plans ⁽¹⁾				Canadian plans ⁽²⁾			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
	Fair value	% of total	Fair value	% of total	Fair value	% of total	Fair value	% of total
Cash and cash equivalents	\$ 33	1%	\$ 33	6%	\$ 5	1%	\$ –	–
Equity securities ⁽³⁾	695	24%	45	8%	212	15%	–	–
Debt securities	1,979	67%	502	85%	1,165	84%	–	–
Other investments ⁽⁴⁾	235	8%	7	1%	4	0%	–	–
Total	\$ 2,942	100%	\$ 587	100%	\$ 1,386	100%	\$ –	–

⁽¹⁾ All the U.S. pension and retiree welfare plan assets have daily quoted prices in active markets, except for the private equity, timber and agriculture assets. In the aggregate, the latter assets represent approximately 7% of all U.S. pension and retiree welfare plan assets as at December 31, 2018 (2017 – 6%).

⁽²⁾ All the Canadian pension plan assets have daily quoted prices in active markets, except for the group annuity contract assets that represent approximately 0.2% of all Canadian pension plan assets as at December 31, 2018 (2017 – 0.3%).

⁽³⁾ Equity securities include direct investments in MFC common shares of \$0.9 (2017 – \$1.3) in the U.S. retiree welfare plan and \$nil (2017 – \$nil) in Canada.

⁽⁴⁾ Other U.S. plan assets include investment in private equity, timberland and agriculture, and managed futures. Other Canadian pension plan assets include investment in the group annuity contract.

(g) Net benefit cost recognized in the Consolidated Statements of Income

Components of the net benefit cost for the pension plans and retiree welfare plans were as follows.

For the years ended December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Defined benefit current service cost	\$ 42	\$ 48	\$ –	\$ 1
Defined benefit administrative expenses	6	5	2	2
Past service cost – plan amendments ⁽¹⁾	8	–	–	–
Past service cost – curtailments ⁽²⁾	10	–	12	–
Service cost	66	53	14	3
Interest on net defined benefit (asset) liability	12	18	3	3
Defined benefit cost	78	71	17	6
Defined contribution cost	78	75	–	–
Net benefit cost	\$ 156	\$ 146	\$ 17	\$ 6

⁽¹⁾ Past service cost – plan amendments includes \$8, reflecting a surplus sharing agreement between the Company and certain legacy employees in Canada, which received regulatory approval in 2018.

⁽²⁾ Past service cost – curtailments includes \$22 in total, reflecting the cost of the voluntary exit and voluntary retirement programs described in section (a) of this note.

(h) Re-measurement effects recognized in Other Comprehensive Income

For the years ended December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Actuarial gains (losses) on defined benefit obligations due to:				
Experience	\$ –	\$ (15)	\$ 7	\$ 9
Demographic assumption changes	(35)	–	1	–
Economic assumption changes	250	(214)	56	(41)
Return on plan assets (excluding interest income)	(315)	312	(16)	30
Change in effect of asset limit	(9)	–	–	–
Total re-measurement effects	\$ (109)	\$ 83	\$ 48	\$ (2)

(i) Assumptions

The key assumptions used by the Company to determine the defined benefit obligation and net benefit cost for the defined benefit pension plans and retiree welfare plans were as follows.

For the years ended December 31,	U.S. Plans				Canadian Plans			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
	2018	2017	2018	2017	2018	2017	2018	2017
To determine the defined benefit obligation at end of year⁽¹⁾:								
Discount rate	4.3%	3.6%	4.3%	3.6%	3.8%	3.5%	3.8%	3.6%
Initial health care cost trend rate ⁽²⁾	n/a	n/a	7.8%	8.5%	n/a	n/a	5.7%	5.9%
To determine the defined benefit cost for the year⁽¹⁾:								
Discount rate	3.6%	4.1%	3.6%	4.1%	3.5%	3.9%	3.6%	4.0%
Initial health care cost trend rate ⁽²⁾	n/a	n/a	8.5%	8.8%	n/a	n/a	5.9%	6.0%

⁽¹⁾ Inflation and salary increase assumptions are not shown as they do not materially affect obligations and cost.

⁽²⁾ The health care cost trend rate used to measure the U.S. based retiree welfare obligation was 7.8% grading to 5.0% for 2030 and years thereafter (2017 – 8.5% grading to 5.0% for 2032) and to measure the net benefit cost was 8.5% grading to 5.0% for 2032 and years thereafter (2017 – 8.8% grading to 5.0% for 2032). In Canada, the rate used to measure the retiree welfare obligation was 5.7% grading to 4.8% for 2026 and years thereafter (2017 – 5.9% grading to 4.8% for 2026) and to measure the net benefit cost was 5.9% grading to 4.8% for 2026 and years thereafter (2017 – 6.0% grading to 4.8% for 2026).

Assumptions regarding future mortality are based on published statistics and mortality tables. The current life expectancies underlying the values of the obligations in the defined benefit pension and retiree welfare plans are as follows.

As at December 31, 2018	U.S.	Canada
Life expectancy (in years) for those currently age 65		
Males	22.5	23.6
Females	24.0	25.5
Life expectancy (in years) at age 65 for those currently age 45		
Males	24.1	24.6
Females	25.6	26.4

(j) Sensitivity of assumptions on obligations

Assumptions used can have a significant effect on the obligations reported for defined benefit pension and retiree welfare plans. The potential impact on the obligations arising from changes in the key assumptions is set out in the following table. The sensitivities assume all other assumptions are held constant. In actuality, inter-relationships with other assumptions may exist.

As at December 31, 2018	Pension plans	Retiree welfare plans
Discount rate:		
Impact of a 1% increase	\$ (423)	\$ (62)
Impact of a 1% decrease	500	74
Health care cost trend rate:		
Impact of a 1% increase	n/a	21
Impact of a 1% decrease	n/a	(18)
Mortality rates⁽¹⁾		
Impact of a 10% decrease	114	14

⁽¹⁾ If the actuarial estimates of mortality are adjusted in the future to reflect unexpected decreases in mortality, the effect of a 10% decrease in mortality rates at each future age would be an increase in life expectancy at age 65 of 0.9 years for U.S. males and females and 0.8 years for Canadian males and females.

(k) Maturity profile

The weighted average duration (in years) of the defined benefit obligations is as follows.

As at December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
U.S. plans	8.8	9.5	9.0	9.8
Canadian plans	12.4	12.8	14.3	14.2

(l) Cash flows – contributions

Total cash payments for all employee future benefits, comprised of cash contributed by the Company to funded defined benefit pension and retiree welfare plans, cash payments directly to beneficiaries in respect of unfunded pension and retiree welfare plans, and cash contributed to defined contribution pension plans, are as follows.

For the years ended December 31,	Pension plans		Retiree welfare plans	
	2018	2017	2018	2017
Defined benefit plans	\$ 79	\$ 85	\$ 10	\$ 12
Defined contribution plans	78	77	–	–
Total	\$ 157	\$ 162	\$ 10	\$ 12

The Company's best estimate of expected cash payments for employee future benefits for the year ending December 31, 2019 is \$88 for defined benefit pension plans, \$78 for defined contribution pension plans and \$12 for retiree welfare plans.

Note 17 Interests in Structured Entities

The Company is involved with both consolidated and unconsolidated structured entities ("SEs") which are established to generate investment and fee income. The Company is also involved with SEs that are used to facilitate financing for the Company. These entities may have some or all the following features: control is not readily identified based on voting rights; restricted activities designed to achieve a narrow objective; high amount of leverage; and/or highly structured capital.

The Company only discloses its involvement in significant consolidated and unconsolidated SEs. In assessing the significance, the Company considers the nature of its involvement with the SE, including whether it is sponsored by the Company (i.e. initially organized and managed by the Company). Other factors considered include the Company's investment in the SE as compared to total investments, its returns from the SE as compared to total net investment income, the SE's size as compared to total funds under management, and its exposure to any other risks from its involvement with the SE.

The Company does not provide financial or other support to its SEs, when it does not have a contractual obligation to do so.

(a) Consolidated SEs

Investment SEs

The Company acts as an investment manager of timberlands and timber companies. The Company's general fund and segregated funds invest in many of these companies. The Company has control over one timberland company which it manages, Hancock Victoria Plantations Holdings PTY Limited ("HVPH"). HVPH is a SE primarily because the Company's employees exercise voting rights over it on behalf of other investors. As at December 31, 2018, the Company's consolidated timber assets relating to HVPH were \$920 (2017 – \$884). The Company does not provide guarantees to other parties against the risk of loss from HVPH.

Financing SEs

The Company securitizes certain insured and variable rate commercial and residential mortgages and HELOC. This activity is facilitated by consolidated entities that are SEs because their operations are limited to issuing and servicing the Company's funding. Further information regarding the Company's mortgage securitization program is included in note 3.

(b) Unconsolidated SEs

Investment SEs

The following table presents the Company's investment and maximum exposure to loss from significant unconsolidated investment SEs, some of which are sponsored by the Company. The Company does not provide guarantees to other parties against the risk of loss from these SEs.

As at December 31,	Company's investment ⁽¹⁾		Company's maximum exposure to loss ⁽²⁾	
	2018	2017	2018	2017
Leveraged leases ⁽³⁾	\$ 3,575	\$ 3,273	\$ 3,575	\$ 3,273
Timberland companies ⁽⁴⁾	788	736	821	786
Real estate companies ⁽⁵⁾	566	361	566	361
Total	\$ 4,929	\$ 4,370	\$ 4,962	\$ 4,420

⁽¹⁾ The Company's investments in these unconsolidated SEs are included in invested assets and the Company's returns from them are included in net investment income and AOCI.

⁽²⁾ The Company's maximum exposure to loss from each SE is limited to amounts invested in each, plus unfunded capital commitments, if any. The Company's investment commitments are disclosed in note 18. The maximum loss is expected to occur only upon the entity's bankruptcy/liquidation, or in case of a natural disaster in the case of the timber companies.

⁽³⁾ These entities are statutory business trusts which use capital provided by the Company and senior debt provided by other parties to finance the acquisition of assets. These assets are leased to third-party lessees under long-term leases. The Company owns equity capital in these business trusts. The Company does not consolidate any of the trusts that are party to the lease arrangements because the Company does not have decision-making power over them.

⁽⁴⁾ These entities own and operate timberlands. The Company invests in their equity and debt. The Company's returns include investment income, investment advisory fees, forestry management fees and performance advisory fees. The Company does not control these entities because it either does not have the power to govern their financial and operating policies or does not have significant variable returns from them, or both.

⁽⁵⁾ These entities, which include the Manulife U.S. REIT, own and manage commercial real estate. The Company invests in their equity. The Company's returns include investment income, investment management fees, property management fees, acquisition/disposition fees, and leasing fees. The Company does not control these entities because it either does not have the power to govern their financial and operating policies or does not have significant variable returns from them, or both.

Financing SEs

The Company's interests and maximum exposure to loss from significant unconsolidated financing SEs are as follows.

As at December 31,	Company's interests ⁽¹⁾	
	2018	2017
Manulife Finance (Delaware), L.P. ⁽²⁾	\$ 821	\$ 835
Manulife Financial Capital Trust II ⁽³⁾	999	1,000
Total	\$ 1,820	\$ 1,835

⁽¹⁾ The Company's interests include amounts borrowed from the SEs and the Company's investment in their subordinated capital, and foreign currency and interest swaps with them, if any.

⁽²⁾ This entity is a wholly-owned partnership used to facilitate the Company's financing. Refer to notes 11 and 18.

⁽³⁾ This entity is an open-ended trust that is used to facilitate the Company's financing. Refer to note 11.

(i) Other invested assets

The Company has investment relationships with a variety of other entities, which result from its direct investment in their debt and/or equity and which have been assessed for control. These other entities' investments include but are not limited to investments in power and infrastructure, oil and gas, private equity, real estate and agriculture, organized as limited partnerships and limited liability companies. Most of these other entities are not sponsored by the Company. The Company's involvement with these other entities is not individually significant. As such, the Company neither provides summary financial data for these entities nor individually assesses whether they are SEs. The Company's maximum exposure to losses because of its involvement with these other entities is limited to its investment in them and amounts committed to be invested but not yet funded. The Company records its income from these entities in net investment income and AOCI. The Company does not provide guarantees to other parties against the risk of loss from these other entities.

(ii) Interest in securitized assets

The Company invests in mortgage/asset-backed securities issued by securitization vehicles sponsored by other parties, including private issuers and government sponsored issuers, to generate investment income. The Company does not own a controlling financial interest in any of the issuers. These securitization vehicles are SEs based on their narrow scope of activities and highly leveraged capital structures. Investments in mortgage/asset-backed securities are reported on the Consolidated Statements of Financial Position as debt securities and private placements, and their fair value and carrying value are disclosed in note 3. The Company's maximum loss from these investments is limited to amounts invested.

Commercial mortgage backed securities ("CMBS") are secured by commercial mortgages and residential mortgage backed securities ("RMBS") are secured by residential mortgages. Asset-backed securities ("ABS") may be secured by various underlying assets including credit card receivables, automobile loans and aviation leases. The mortgage/asset-backed securities that the Company invests in primarily originate in North America.

The following table presents investments in securitized holdings by the type and asset quality.

As at December 31,	2018				2017
	CMBS	RMBS	ABS	Total	Total
AAA	\$ 1,653	\$ 8	\$ 810	\$ 2,471	\$ 2,503
AA	–	–	306	306	401
A	72	7	374	453	504
BBB	–	–	70	70	142
BB and below	–	–	–	–	26
Total company exposure	\$ 1,725	\$ 15	\$ 1,560	\$ 3,300	\$ 3,576

(iii) Mutual funds

The Company sponsors and may invest in a range of public mutual funds with a broad range of investment styles. As sponsor, the Company organizes mutual funds that implement investment strategies on behalf of current and future investors. The Company earns fees which are at market rates for providing advisory and administrative services to these mutual funds. Generally, the Company does not control its sponsored mutual funds because either the Company does not have power to govern their financial and operating policies, or its returns in the form of fees and ownership interests are not significant, or both. Certain mutual funds are SEs because their decision-making rights are not vested in voting equity interests and their investors are provided with redemption rights.

The Company's relationships with these mutual funds are not individually significant. As such, the Company neither provides summary financial data for these mutual funds nor individually assesses whether they are SEs. The Company's interest in mutual funds is limited to its investment and fees earned, if any. The Company's investments in mutual funds are recorded as part of its investment in public equities within the Consolidated Statements of Financial Position. For information regarding the Company's invested assets, refer to note 3. The Company does not provide guarantees to other parties against the risk of loss from these mutual funds.

As sponsor, the Company's investment in startup capital of mutual funds as at December 31, 2018 was \$1,711 (2017 – \$1,918). The Company's retail mutual fund assets under management as at December 31, 2018 were \$182,219 (2017 – \$191,507).

Note 18 Commitments and Contingencies

(a) Legal proceedings

The Company is regularly involved in legal actions, both as a defendant and as a plaintiff. The legal actions where the Company is a party ordinarily relate to its activities as a provider of insurance protection or wealth management products, reinsurance, or its capacity as an investment adviser, employer, or taxpayer. Other life insurers and asset managers, operating in the jurisdictions in which the Company does business, have been subject to a wide variety of other types of actions, some of which resulted in substantial judgments or settlements against the defendants; it is possible that the Company may become involved in similar actions in the future. In addition, government and regulatory bodies in Canada, the United States, Asia and other jurisdictions where the Company conducts business regularly make inquiries and, from time to time, require the production of information or conduct examinations concerning the Company's compliance with, among other things, insurance laws, securities laws, and laws governing the activities of broker-dealers.

A class action against John Hancock Life Insurance Company (U.S.A.) ("JHUSA") is pending in the U.S. District Court for the Southern District of New York (the "Southern District of NY") in which claims are made that JHUSA breached, and continues to breach, the contractual terms of certain universal life policies issued between approximately 1990 and 2006 by including impermissible charges in its cost of insurance ("COI") calculations and certain other rider charges. The Company believes that its COI calculations have been, and continue to be, in accordance with the terms of the policies. In May 2018, the parties agreed to the financial terms of a settlement in the amount of US\$91. On November 1, 2018, the court granted preliminary approval of the US\$91 settlement and scheduled a fairness hearing for February 19, 2019.

In June 2018, a class action was initiated against JHUSA and John Hancock Life Insurance Company of New York ("JHNY") in the Southern District of NY on behalf of owners of Performance universal life policies issued between 2003 and 2009 whose policies are subject to a COI increase announced in 2018. In October 2018, an almost identical class action was initiated against JHUSA and JHNY in the Southern District of NY. It was filed as a related case as the one filed in June and has been assigned to the same judge. Discovery has commenced in these cases and will continue through 2019. No hearings on substantive matters have been scheduled. It is too early to assess the range of potential outcomes for these two related lawsuits.

(b) Investment commitments

In the normal course of business, various investment commitments are outstanding which are not reflected in the Consolidated Financial Statements. There were \$10,372 (2017 – \$8,235) of outstanding investment commitments as at December 31, 2018, of which \$888 (2017 – \$682) mature in 30 days, \$3,546 (2017 – \$2,177) mature in 31 to 365 days and \$5,938 (2017 – \$5,376) mature after one year.

(c) Letters of credit

In the normal course of business, third-party relationship banks issue letters of credit on the Company's behalf. The Company's businesses utilize letters of credit for which third parties are the beneficiaries, as well as for affiliate reinsurance transactions between its subsidiaries. As at December 31, 2018, letters of credit for which third parties are beneficiary, in the amount of \$74 (2017 – \$77), were outstanding.

(d) Guarantees**(i) Guarantees regarding Manulife Finance (Delaware), L.P. ("MFLP")**

MFC has guaranteed the payment of amounts on the \$650 subordinated debentures due on December 15, 2041 issued by MFLP, a wholly-owned unconsolidated partnership.

(ii) Guarantees regarding The Manufacturers Life Insurance Company

On January 29, 2007, MFC provided a subordinated guarantee, as amended and restated on January 13, 2017, of Class A Shares and Class B Shares of MLI and any other class of preferred shares that rank in parity with Class A Shares or Class B Shares of MLI. For the following subordinated debentures issued by MLI, MFC has provided a subordinated guarantee on the day of issuance: \$500 issued on February 21, 2014; \$500 issued on December 1, 2014; \$750 issued on March 10, 2015; \$350 issued on June 1, 2015; and \$1,000 issued on November 20, 2015.

The following table sets forth certain condensed consolidated financial information for MFC and MFLP.

Condensed Consolidated Statements of Income Information

	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
For the year ended December 31, 2018						
Total revenue	\$ 443	\$ 38,994	\$ 434	\$ (899)	\$ 38,972	\$ 62
Net income (loss) attributed to shareholders	4,800	5,076	(419)	(4,657)	4,800	22
	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
For the year ended December 31, 2017						
Total revenue	\$ 182	\$ 58,445	\$ 270	\$ (574)	\$ 58,323	\$ 29
Net income (loss) attributed to shareholders	2,104	2,467	(257)	(2,210)	2,104	6

Condensed Consolidated Statements of Financial Position

	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
As at December 31, 2018						
Invested assets	\$ 21	\$ 353,632	\$ 11	\$ –	\$ 353,664	\$ 11
Total other assets	54,346	83,523	3	(54,474)	83,398	1,059
Segregated funds net assets	–	313,209	–	–	313,209	–
Insurance contract liabilities	–	328,654	–	–	328,654	–
Investment contract liabilities	–	3,265	–	–	3,265	–
Segregated funds net liabilities	–	313,209	–	–	313,209	–
Total other liabilities	8,403	50,043	–	(454)	57,992	833
	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
As at December 31, 2017						
Invested assets	\$ 21	\$ 334,191	\$ 10	\$ –	\$ 334,222	\$ 5
Total other assets	48,688	71,180	4	(48,868)	71,004	1,033
Segregated funds net assets	–	324,307	–	–	324,307	–
Insurance contract liabilities	–	304,605	–	–	304,605	–
Investment contract liabilities	–	3,126	–	–	3,126	–
Segregated funds net liabilities	–	324,307	–	–	324,307	–
Total other liabilities	7,696	48,145	–	(509)	55,332	831

(iii) Guarantees regarding John Hancock Life Insurance Company (U.S.A.) ("JHUSA")

Details of guarantees regarding certain securities issued or to be issued by JHUSA are outlined in note 23.

(e) Pledged assets

In the normal course of business, the Company pledges its assets in respect of liabilities incurred, strictly for providing collateral to the counterparty. In the event of the Company's default, the counterparty is entitled to apply the collateral to settle the liability. The pledged assets are returned to the Company if the underlying transaction is terminated or, in the case of derivatives, if there is a decrease in the net exposure due to market value changes.

The amounts pledged are as follows.

As at December 31,	2018		2017	
	Debt securities	Other	Debt securities	Other
In respect of:				
Derivatives	\$ 3,655	\$ 102	\$ 3,189	\$ 44
Regulatory requirements	412	84	398	86
Real estate	—	—	—	2
Repurchase agreements	64	—	228	—
Non-registered retirement plans in trust	—	420	—	412
Other	3	301	3	271
Total	\$ 4,134	\$ 907	\$ 3,818	\$ 815

(f) Lease obligations

The Company has a number of operating lease obligations, primarily for the use of office space. The aggregate future minimum lease payments under non-cancelable operating leases are \$575 (2017 – \$838). Payments by year are included in the "Risk Management" section of the Company's 2018 MD&A under Liquidity Risk.

(g) Participating business

In some territories where the Company maintains participating accounts, there are regulatory restrictions on the amounts of profit that can be transferred to shareholders. Where applicable, these restrictions generally take the form of a fixed percentage of policyholder dividends. For participating businesses operating as separate "closed blocks", transfers are governed by the terms of MLI's and John Hancock Mutual Life Insurance Company's plans of demutualization.

(h) Fixed surplus notes

A third party contractually provides standby financing arrangements for the Company's U.S. operations under which, in certain circumstances, funds may be provided in exchange for the issuance of fixed surplus notes. As at December 31, 2018, the Company had no fixed surplus notes outstanding.

Note 19 Segmented Information

Effective January 1, 2018, as a result of the organizational changes made to drive better alignment with the Company's strategic priorities as well as to increase focus and leverage scale in its wealth and asset management businesses, the Company's wealth and asset management businesses are now a primary reporting segment.

The Company's reporting segments are Asia, Canada, U.S., Global WAM and Corporate and Other. Each reporting segment is responsible for managing its operating results, developing products, defining strategies for services and distribution based on the profile and needs of its business and market. The Company's significant product and service offerings are shown below.

Wealth and asset management businesses (Global WAM) – include mutual funds and exchange-traded funds, group retirement and savings products, and institutional asset management services across all major asset classes. These products and services are distributed through multiple distribution channels, including agents and brokers affiliated with the Company, independent securities brokerage firms and financial advisors, pension plan consultants and banks.

Insurance and annuity products (Asia, Canada and U.S.) – includes a variety of individual life insurance, individual and group long-term care insurance and guaranteed and partially guaranteed annuity products. Products are distributed through multiple distribution channels, including insurance agents, brokers, banks, financial planners and direct marketing. Manulife Bank of Canada offers a variety of deposit and credit products to Canadian customers.

Corporate and Other Segment – comprised of investment performance on assets backing capital, net of amounts allocated to operating segments; costs incurred by the corporate office related to shareholder activities (not allocated to the operating segments); financing costs; Property and Casualty Reinsurance Business; and run-off reinsurance operations including variable annuities and accident and health.

In addition to changing the segments, the Company changed the segment reporting for the changes to actuarial methods and assumptions. These changes were previously reported in the Corporate and Other segment and are now reported in the respective reporting segments. Prior period amounts have been restated to reflect these changes.

By segment

As at and for the year ended December 31, 2018	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Revenue						
Life and health insurance	\$ 14,938	\$ 8,975	\$ 6,341	\$ –	\$ 98	\$ 30,352
Annuities and pensions ⁽¹⁾	3,175	452	(9,967)	–	–	(6,340)
Net premium income	18,113	9,427	(3,626)	–	98	24,012
Net investment income (loss)	278	2,764	1,723	(8)	(225)	4,532
Other revenue	1,296	1,446	2,542	5,472	(328)	10,428
Total revenue	19,687	13,637	639	5,464	(455)	38,972
Contract benefits and expenses						
Life and health insurance	10,875	8,044	4,255	–	(37)	23,137
Annuities and pensions	1,986	518	(9,784)	77	–	(7,203)
Net benefits and claims	12,861	8,562	(5,529)	77	(37)	15,934
Interest expense	187	447	56	2	583	1,275
Other expenses	4,749	3,063	3,428	4,322	682	16,244
Total contract benefits and expenses	17,797	12,072	(2,045)	4,401	1,228	33,453
Income (loss) before income taxes	1,890	1,565	2,684	1,063	(1,683)	5,519
Income tax recovery (expense)	(355)	(321)	(352)	(108)	504	(632)
Net income (loss)	1,535	1,244	2,332	955	(1,179)	4,887
Less net income (loss) attributed to:						
Non-controlling interests	208	–	–	–	6	214
Participating policyholders	(360)	233	–	–	–	(127)
Net income (loss) attributed to shareholders	\$ 1,687	\$ 1,011	\$ 2,332	\$ 955	\$ (1,185)	\$ 4,800
Total assets	\$ 112,327	\$ 214,101	\$ 272,228	\$ 130,379	\$ 21,236	\$ 750,271

As at and for the year ended December 31, 2017	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Revenue						
Life and health insurance	\$ 13,145	\$ 4,322	\$ 6,778	\$ –	\$ 110	\$ 24,355
Annuities and pensions	2,568	443	844	–	–	3,855
Net premium income	15,713	4,765	7,622	–	110	28,210
Net investment income (loss)	4,044	4,560	10,657	42	64	19,367
Other revenue	933	1,862	3,039	5,158	(246)	10,746
Total revenue	20,690	11,187	21,318	5,200	(72)	58,323
Contract benefits and expenses						
Life and health insurance	11,881	5,018	16,193	–	268	33,360
Annuities and pensions	1,889	2,404	1,574	74	–	5,941
Net benefits and claims	13,770	7,422	17,767	74	268	39,301
Interest expense	164	307	36	1	631	1,139
Other expenses	4,360	3,069	3,374	4,193	386	15,382
Total contract benefits and expenses	18,294	10,798	21,177	4,268	1,285	55,822
Income (loss) before income taxes	2,396	389	141	932	(1,357)	2,501
Income tax recovery (expense)	(405)	159	(1,342)	146	1,203	(239)
Net income (loss)	1,991	548	(1,201)	1,078	(154)	2,262
Less net income (loss) attributed to:						
Non-controlling interests	187	–	–	–	7	194
Participating policyholders	(30)	(6)	–	–	–	(36)
Net income (loss) attributed to shareholders	\$ 1,834	\$ 554	\$ (1,201)	\$ 1,078	\$ (161)	\$ 2,104
Total assets	\$ 96,354	\$ 217,813	\$ 263,523	\$ 131,779	\$ 20,064	\$ 729,533

⁽¹⁾ During the year, the Company ceded premiums to reinsure a block of legacy U.S. individual pay-out annuities business, refer to note 7(k) for details.

The results of the Company's reporting segments differ from its geographic segments primarily due to the allocation of the Company's Global WAM and Corporate and Other segments into the geographic segments to which its businesses relate.

By geographic location

As at and for the year ended
December 31, 2018

	Asia	Canada	U.S.	Other	Total
Revenue					
Life and health insurance	\$ 15,010	\$ 8,561	\$ 6,342	\$ 439	\$ 30,352
Annuities and pensions	3,175	452	(9,967)	–	(6,340)
Net premium income	18,185	9,013	(3,625)	439	24,012
Net investment income (loss)	371	2,933	1,032	196	4,532
Other revenue	2,115	2,904	5,395	14	10,428
Total revenue	\$ 20,671	\$ 14,850	\$ 2,802	\$ 649	\$ 38,972

As at and for the year ended
December 31, 2017

	Asia	Canada	U.S.	Other	Total
Revenue					
Life and health insurance	\$ 13,215	\$ 3,894	\$ 6,780	\$ 466	\$ 24,355
Annuities and pensions	2,568	443	844	–	3,855
Net premium income	15,783	4,337	7,624	466	28,210
Net investment income (loss)	4,258	4,642	10,407	60	19,367
Other revenue	1,632	3,187	5,911	16	10,746
Total revenue	\$ 21,673	\$ 12,166	\$ 23,942	\$ 542	\$ 58,323

Note 20 Related Parties

The Company enters into transactions with related parties in the normal course of business and at the terms that would exist in arm's-length transactions.

(a) Transactions with certain related parties

Transactions with MFLP, a wholly owned unconsolidated partnership, and MFCT, a wholly owned unconsolidated trust, are described in notes 10, 11 and 18. Refer to note 3(a) for additional transactions with related parties.

(b) Compensation of key management personnel

The Company's key management personnel are those personnel who have the authority and responsibility for planning, directing and controlling the activities of the Company. Directors (both executive and non-executive) and senior management are considered key personnel. In 2018, this group was expanded to include a greater number of executives. As a result, the 2017 figures below have been restated to align with this larger group. A summary of compensation of key management personnel is as follows.

For the years ended December 31,	2018	2017
Short-term employee benefits	\$ 65	\$ 78
Post-employment benefits	5	5
Share-based payments	50	59
Termination benefits	5	6
Other long-term benefits	2	2
Total	\$ 127	\$ 150

Note 21 Subsidiaries

The following is a list of Manulife's directly and indirectly held major operating subsidiaries.

As at December 31, 2018

(100% owned unless otherwise noted in brackets beside company name)	Address	Description
The Manufacturers Life Insurance Company	Toronto, Canada	Leading Canadian-based financial services company that offers a diverse range of financial protection products and wealth management services
Manulife Holdings (Alberta) Limited	Calgary, Canada	Holding company
John Hancock Financial Corporation	Wilmington, Delaware, U.S.A.	Holding company
The Manufacturers Investment Corporation	Michigan, U.S.A.	Holding company
John Hancock Reassurance Company Ltd.	Michigan, U.S.A.	Captive insurance subsidiary that provides life, annuity and long-term care reinsurance to affiliates
John Hancock Life Insurance Company (U.S.A.)	Michigan, U.S.A.	U.S. life insurance company licensed in all states, except New York
John Hancock Subsidiaries LLC	Wilmington, Delaware, U.S.A.	Holding company

As at December 31, 2018

(100% owned unless otherwise noted in brackets beside company name)

	Address	Description
John Hancock Financial Network, Inc.	Boston, Massachusetts, U.S.A.	Financial services distribution organization
John Hancock Advisers, LLC	Boston, Massachusetts, U.S.A.	Investment advisor
John Hancock Funds, LLC	Boston, Massachusetts, U.S.A.	Broker-dealer
Manulife Asset Management (U.S.), LLC	Wilmington, Delaware, U.S.A.	Asset management company
Hancock Natural Resource Group, Inc.	Boston, Massachusetts, U.S.A.	Manager of globally diversified timberland and agricultural portfolios
John Hancock Life Insurance Company of New York	New York, U.S.A.	U.S. life insurance company licensed in New York
John Hancock Investment Management Services, LLC	Boston, Massachusetts, U.S.A.	Investment advisor
John Hancock Life & Health Insurance Company	Boston, Massachusetts, U.S.A.	U.S. life insurance company licensed in all states
John Hancock Distributors, LLC	Wilmington, Delaware, U.S.A.	Broker-dealer
John Hancock Insurance Agency, Inc.	Wilmington, Delaware, U.S.A.	Insurance agency
Manulife Reinsurance Limited	Hamilton, Bermuda	Provides life and financial reinsurance to affiliates
Manulife Reinsurance (Bermuda) Limited	Hamilton, Bermuda	Provides life and annuity reinsurance to affiliates
Manulife Bank of Canada	Waterloo, Canada	Provides integrated banking products and service options not available from an insurance company
Manulife Asset Management Holdings (Canada), Inc.	Toronto, Canada	Holding company
Manulife Asset Management Limited	Toronto, Canada	Provides investment counseling, portfolio and mutual fund management in Canada
First North American Insurance Company	Toronto, Canada	Property and casualty insurance company
NAL Resources Management Limited	Calgary, Canada	Management company for oil and gas properties
Manulife Resources Limited	Calgary, Canada	Holds oil and gas properties
Manulife Property Limited Partnership	Toronto, Canada	Holds oil and gas royalties
Manulife Property Limited Partnership II	Toronto, Canada	Holds oil and gas royalties and foreign bonds and equities
Manulife Western Holdings Limited Partnership	Calgary, Canada	Holds oil and gas properties
Manulife Securities Investment Services, Inc.	Oakville, Canada	Mutual fund dealer for Canadian operations
Manulife Holdings (Bermuda) Limited	Hamilton, Bermuda	Holding company
Manufacturers P&C Limited	St. Michael, Barbados	Provides property and casualty reinsurance
Manulife Financial Asia Limited	Hong Kong, China	Holding company
Manulife (Cambodia) PLC	Phnom Penh, Cambodia	Life insurance company
Manufacturers Life Reinsurance Limited	St. Michael, Barbados	Provides life and annuity reinsurance to affiliates
Manulife (Vietnam) Limited	Ho Chi Minh City, Vietnam	Life insurance company
Manulife Asset Management (Vietnam) Company Limited	Ho Chi Minh City, Vietnam	Fund management company
Manulife International Holdings Limited	Hong Kong, China	Holding company
Manulife (International) Limited	Hong Kong, China	Life insurance company
Manulife-Sinochem Life Insurance Co. Ltd. (51%)	Shanghai, China	Life insurance company
Manulife Asset Management International Holdings Limited	Hong Kong, China	Holding company
Manulife Asset Management (Hong Kong) Limited	Hong Kong, China	Investment management and advisory company marketing mutual funds
Manulife Asset Management (Taiwan) Co., Ltd.	Taipei, Taiwan (China)	Asset management company
Manulife Life Insurance Company (Japan)	Tokyo, Japan	Life insurance company
Manulife Asset Management (Japan) Limited	Tokyo, Japan	Investment management and advisory company and mutual fund business
Manulife Insurance (Thailand) Public Company Limited (85.8%) ⁽¹⁾	Bangkok, Thailand	Life insurance company
Manulife Asset Management (Thailand) Company Limited (92.7%) ⁽¹⁾	Bangkok, Thailand	Investment management company
Manulife Holdings Berhad (59.5%)	Kuala Lumpur, Malaysia	Holding company

As at December 31, 2018

(100% owned unless otherwise noted in brackets beside company name)

	Address	Description
Manulife Insurance Berhad (59.5%)	Kuala Lumpur, Malaysia	Life insurance company
Manulife Asset Management Services Berhad (59.5%)	Kuala Lumpur, Malaysia	Asset management company
Manulife (Singapore) Pte. Ltd.	Singapore	Life insurance company
Manulife Asset Management (Singapore) Pte. Ltd.	Singapore	Asset management company
The Manufacturers Life Insurance Co. (Phils.), Inc.	Makati City, Philippines	Life insurance company
Manulife Chinabank Life Assurance Corporation (60%)	Makati City, Philippines	Life insurance company
PT Asuransi Jiwa Manulife Indonesia	Jakarta, Indonesia	Life insurance company
PT Manulife Aset Manajemen Indonesia	Jakarta, Indonesia	Investment management company marketing mutual funds and discretionary funds
Manulife Asset Management (Europe) Limited	London, England	Investment management company for Manulife Financial's international funds
Manulife Assurance Company of Canada	Toronto, Canada	Life insurance company
EIS Services (Bermuda) Limited	Hamilton, Bermuda	Investment holding company
Berkshire Insurance Services Inc.	Toronto, Canada	Investment holding company
JH Investments (Delaware), LLC	Boston, Massachusetts, U.S.A.	Investment holding company
Manulife Securities Incorporated	Oakville, Canada	Investment dealer
Manulife Asset Management (North America) Limited	Toronto, Canada	Investment advisor
Regional Power Inc.	Mississauga, Canada	Developer and operator of hydro-electric power projects

⁽¹⁾ MFC voting rights percentages are the same as the ownership percentages except for Manulife Insurance (Thailand) Public Company Limited and Manulife Asset Management (Thailand) Company Limited where MFC's voting rights are 93.0% and 96.4%, respectively.

Note 22 Segregated Funds

The Company manages segregated funds on behalf of policyholders. Policyholders are provided with the opportunity to invest in different categories of segregated funds that respectively hold a range of underlying investments. The Company retains legal title to the underlying investments; however, returns from these investments belong to the policyholders. Accordingly, the Company does not bear the risk associated with these assets outside of guarantees offered on certain variable life and annuity products. The "Risk Management" section of the Company's 2018 MD&A provides information regarding the variable annuity and segregated fund guarantees.

The composition of net assets by categories of segregated funds was within the following ranges for the years ended December 31, 2018 and 2017.

Type of fund	Ranges in per cent	
	2018	2017
Money market funds	2% to 3%	2% to 3%
Fixed income funds	14% to 15%	14% to 15%
Balanced funds	25% to 26%	22% to 29%
Equity funds	58% to 60%	55% to 60%

Money market funds consist of investments that have a term to maturity of less than one year. Fixed income funds primarily consist of investments in fixed grade income securities and may contain smaller investments in diversified equities or high-yield bonds. Relative to fixed income funds, balanced funds consist of fixed income securities and a larger equity investment component. The types of equity funds available to policyholders range from low volatility equity funds to aggressive equity funds. Equity funds invest in a varying mix of Canadian, U.S. and global equities.

The underlying investments of the segregated funds consist of both individual securities and mutual funds (collectively "net assets"), some of which may be structured entities. The carrying value and change in segregated funds net assets are as follows. Fair value related information of segregated funds is disclosed in note 3(g).

Segregated funds net assets

As at December 31,	2018	2017
Investments at market value		
Cash and short-term securities	\$ 3,700	\$ 4,756
Debt securities	15,313	15,472
Equities	11,661	12,624
Mutual funds	277,133	288,007
Other investments	4,678	4,514
Accrued investment income	1,811	201
Other assets and liabilities, net	(700)	(766)
Total segregated funds net assets	\$ 313,596	\$ 324,808
Composition of segregated funds net assets		
Held by policyholders	\$ 313,209	\$ 324,307
Held by the Company	387	501
Total segregated funds net assets	\$ 313,596	\$ 324,808

Changes in segregated funds net assets

For the years ended December 31,	2018	2017
Net policyholder cash flow		
Deposits from policyholders	\$ 38,236	\$ 34,776
Net transfers to general fund	(1,089)	(1,734)
Payments to policyholders	(47,475)	(46,305)
	(10,328)	(13,263)
Investment related		
Interest and dividends	19,535	16,930
Net realized and unrealized investment gains (losses)	(34,683)	24,384
	(15,148)	41,314
Other		
Management and administration fees	(3,985)	(4,161)
Impact of changes in foreign exchange rates	18,249	(14,790)
	14,264	(18,951)
Net additions (deductions)	(11,212)	9,100
Segregated funds net assets, beginning of year	324,808	315,708
Segregated funds net assets, end of year	\$ 313,596	\$ 324,808

Segregated funds assets may be exposed to a variety of financial and other risks. These risks are primarily mitigated by investment guidelines that are actively monitored by professional and experienced portfolio advisors. The Company is not exposed to these risks beyond the liabilities related to the guarantees associated with certain variable life and annuity products. Accordingly, the Company's exposure to loss from segregated fund products is limited to the value of these guarantees.

These guarantees are recorded within the Company's insurance contract liabilities. Assets supporting these guarantees are recognized in invested assets according to their investment type.

Note 23 Information Provided in Connection with Investments in Deferred Annuity Contracts and SignatureNotes Issued or Assumed by John Hancock Life Insurance Company (U.S.A.)

The following condensed consolidated financial information, presented in accordance with IFRS, and the related disclosure have been included in these Consolidated Financial Statements with respect to JHUSA in compliance with Regulation S-X and Rule 12h-5 of the United States Securities and Exchange Commission (the "Commission"). These financial statements are incorporated by reference in the MFC and its subsidiaries registration statements that are described below and which relate to MFC's guarantee of certain securities to be issued by its subsidiaries.

JHUSA maintains a book of deferred annuity contracts that feature a market value adjustment, some of which are registered with the Commission. The deferred annuity contracts may contain variable investment options along with fixed investment period options, or may offer only fixed investment period options. The fixed investment period options enable the participant to invest fixed amounts of money for fixed terms at fixed interest rates, subject to a market value adjustment if the participant desires to terminate a fixed investment period before its maturity date. The annuity contract provides for the market value adjustment to keep the parties whole with respect to the fixed interest bargain for the entire fixed investment period. These fixed investment period options that contain a market value adjustment feature are referred to as "MVAs".

JHUSA may also sell medium-term notes to retail investors under its SignatureNotes program.

Effective December 31, 2009, John Hancock Variable Life Insurance Company (the "Variable Company") and John Hancock Life Insurance Company (the "Life Company") merged with and into JHUSA. In connection with the mergers, JHUSA assumed the Variable Company's rights and obligations with respect to the MVAs issued by the Variable Company and the Life Company's rights and obligations with respect to the *SignatureNotes* issued by the Life Company.

MFC fully and unconditionally guaranteed the payment of JHUSA's obligations under the MVAs and under the *SignatureNotes* (including the MVAs and *SignatureNotes* assumed by JHUSA in the merger), and such MVAs and the *SignatureNotes* were registered with the Commission. The *SignatureNotes* and MVAs assumed or issued by JHUSA are collectively referred to in this note as the "Guaranteed Securities". JHUSA is, and each of the Variable Company and the Life Company was, a wholly owned subsidiary of MFC.

MFC's guarantees of the Guaranteed Securities are unsecured obligations of MFC and are subordinated in right of payment to the prior payment in full of all other obligations of MFC, except for other guarantees or obligations of MFC which by their terms are designated as ranking equally in right of payment with or subordinate to MFC's guarantees of the Guaranteed Securities.

The laws of the State of New York govern MFC's guarantees of the *SignatureNotes* issued or assumed by JHUSA and the laws of the Commonwealth of Massachusetts govern MFC's guarantees of the MVAs issued or assumed by JHUSA. MFC has consented to the jurisdiction of the courts of New York and Massachusetts. However, because a substantial portion of MFC's assets are located outside the United States, the assets of MFC located in the United States may not be sufficient to satisfy a judgment given by a federal or state court in the United States to enforce the subordinate guarantees. In general, the federal laws of Canada and the laws of the Province of Ontario, where MFC's principal executive offices are located, permit an action to be brought in Ontario to enforce such a judgment provided that such judgment is subsisting and unsatisfied for a fixed sum of money and not void or voidable in the United States and a Canadian court will render a judgment against MFC in a certain dollar amount, expressed in Canadian dollars, subject to customary qualifications regarding fraud, violations of public policy, laws limiting the enforcement of creditor's rights and applicable statutes of limitations on judgments. There is currently no public policy in effect in the Province of Ontario that would support avoiding the recognition and enforcement in Ontario of a judgment of a New York or Massachusetts court on MFC's guarantees of the *SignatureNotes* issued or assumed by JHUSA or a Massachusetts court on guarantees of the MVAs issued or assumed by JHUSA.

MFC is a holding company. MFC's assets primarily consist of investments in its subsidiaries. MFC's cash flows primarily consist of dividends and interest payments from its operating subsidiaries, offset by expenses and shareholder dividends and MFC stock repurchases. As a holding company, MFC's ability to meet its cash requirements, including, but not limited to, paying any amounts due under its guarantees, substantially depends upon dividends from its operating subsidiaries.

These subsidiaries are subject to certain regulatory restrictions under laws in Canada, the United States and certain other countries, which may limit their ability to pay dividends or make contributions or loans to MFC. For example, some of MFC's subsidiaries are subject to restrictions prescribed by the ICA on their ability to declare and pay dividends. The restrictions related to dividends imposed by the ICA are described in note 13.

In the United States, insurance laws in Michigan, New York, and Massachusetts, the jurisdictions in which certain of MFC's U.S. insurance company subsidiaries are domiciled, impose general limitations on the payment of dividends and other upstream distributions or loans by these insurance subsidiaries. These limitations are described in note 13.

In Asia, the insurance laws of the jurisdictions in which MFC operates either provide for specific restrictions on the payment of dividends or other distributions or loans by subsidiaries or impose solvency or other financial tests, which could affect the ability of subsidiaries to pay dividends in certain circumstances.

There can be no assurance that any current or future regulatory restrictions in Canada, the United States or Asia will not impair MFC's ability to meet its cash requirements, including, but not limited to, paying any amounts due under its guarantee.

The following condensed consolidated financial information, presented in accordance with IFRS, reflects the effects of the mergers and is provided in compliance with Regulation S-X and in accordance with Rule 12h-5 of the Commission.

Condensed Consolidated Statement of Financial Position

As at December 31, 2018	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Assets					
Invested assets	\$ 21	\$ 105,043	\$ 248,962	\$ (362)	\$ 353,664
Investments in unconsolidated subsidiaries	54,015	7,356	17,738	(79,109)	–
Reinsurance assets	–	63,435	9,136	(29,518)	43,053
Other assets	331	17,025	43,213	(20,224)	40,345
Segregated funds net assets	–	168,476	146,671	(1,938)	313,209
Total assets	\$ 54,367	\$ 361,335	\$ 465,720	\$ (131,151)	\$ 750,271
Liabilities and equity					
Insurance contract liabilities	\$ –	\$ 155,162	\$ 203,682	\$ (30,190)	\$ 328,654
Investment contract liabilities	–	1,191	2,076	(2)	3,265
Other liabilities	275	18,136	46,072	(19,992)	44,491
Long-term debt	4,769	–	–	–	4,769
Capital instruments	3,359	632	4,741	–	8,732
Segregated funds net liabilities	–	168,476	146,671	(1,938)	313,209
Shareholders' equity	45,964	17,738	61,291	(79,029)	45,964
Participating policyholders' equity	–	–	94	–	94
Non-controlling interests	–	–	1,093	–	1,093
Total liabilities and equity	\$ 54,367	\$ 361,335	\$ 465,720	\$ (131,151)	\$ 750,271

Condensed Consolidated Statement of Financial Position

As at December 31, 2017	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Assets					
Invested assets	\$ 21	\$ 108,144	\$ 226,421	\$ (364)	\$ 334,222
Investments in unconsolidated subsidiaries	48,374	6,509	14,999	(69,882)	–
Reinsurance assets	–	49,927	8,281	(27,849)	30,359
Other assets	314	18,678	40,715	(19,062)	40,645
Segregated funds net assets	–	176,139	149,812	(1,644)	324,307
Total assets	\$ 48,709	\$ 359,397	\$ 440,228	\$ (118,801)	\$ 729,533
Liabilities and equity					
Insurance contract liabilities	\$ –	\$ 147,155	\$ 185,884	\$ (28,434)	\$ 304,605
Investment contract liabilities	–	1,130	1,998	(2)	3,126
Other liabilities	297	19,399	41,395	(18,930)	42,161
Long-term debt	4,784	–	–	–	4,784
Capital instruments	2,615	584	5,188	–	8,387
Segregated funds net liabilities	–	176,139	149,812	(1,644)	324,307
Shareholders' equity	41,013	14,990	54,801	(69,791)	41,013
Participating policyholders' equity	–	–	221	–	221
Non-controlling interests	–	–	929	–	929
Total liabilities and equity	\$ 48,709	\$ 359,397	\$ 440,228	\$ (118,801)	\$ 729,533

Condensed Consolidated Statement of Income

For the year ended December 31, 2018	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Revenue					
Gross premiums	\$ –	\$ 8,452	\$ 31,814	\$ (1,116)	\$39,150
Premiums ceded to reinsurers	–	(14,149)	(2,105)	1,116	(15,138)
Net premium income	–	(5,697)	29,709	–	24,012
Net investment income (loss)	445	907	4,126	(946)	4,532
Net other revenue	(2)	1,799	9,820	(1,189)	10,428
Total revenue	443	(2,991)	43,655	(2,135)	38,972
Contract benefits and expenses					
Net benefits and claims	–	(7,403)	22,862	475	15,934
Commissions, investment and general expenses	19	3,427	14,052	(1,660)	15,838
Other expenses	380	233	2,018	(950)	1,681
Total contract benefits and expenses	399	(3,743)	38,932	(2,135)	33,453
Income (loss) before income taxes	44	752	4,723	–	5,519
Income tax (expense) recovery	(11)	223	(844)	–	(632)
Income (loss) after income taxes	33	975	3,879	–	4,887
Equity in net income (loss) of unconsolidated subsidiaries	4,767	1,206	2,181	(8,154)	–
Net income (loss)	\$ 4,800	\$ 2,181	\$ 6,060	\$ (8,154)	\$ 4,887
Net income (loss) attributed to:					
Non-controlling interests	\$ –	\$ –	\$ 214	\$ –	\$ 214
Participating policyholders	–	(10)	(127)	10	(127)
Shareholders	4,800	2,191	5,973	(8,164)	4,800
	\$ 4,800	\$ 2,181	\$ 6,060	\$ (8,154)	\$ 4,887

Condensed Consolidated Statement of Income

For the year ended December 31, 2017	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Revenue					
Gross premiums	\$ –	\$ 8,561	\$ 22,895	\$ 4,905	\$36,361
Premiums ceded to reinsurers	–	2,523	(5,765)	(4,909)	(8,151)
Net premium income	–	11,084	17,130	(4)	28,210
Net investment income (loss)	178	7,986	11,947	(744)	19,367
Net other revenue	4	2,874	10,864	(2,996)	10,746
Total revenue	182	21,944	39,941	(3,744)	58,323
Contract benefits and expenses					
Net benefits and claims	–	20,803	19,179	(681)	39,301
Commissions, investment and general expenses	11	3,208	13,852	(2,049)	15,022
Other expenses	404	194	1,915	(1,014)	1,499
Total contract benefits and expenses	415	24,205	34,946	(3,744)	55,822
Income (loss) before income taxes	(233)	(2,261)	4,995	–	2,501
Income tax (expense) recovery	62	1,134	(1,435)	–	(239)
Income (loss) after income taxes	(171)	(1,127)	3,560	–	2,262
Equity in net income (loss) of unconsolidated subsidiaries	2,275	628	(486)	(2,417)	–
Net income (loss)	\$ 2,104	\$ (499)	\$ 3,074	\$ (2,417)	\$ 2,262
Net income (loss) attributed to:					
Non-controlling interests	\$ –	\$ –	\$ 194	\$ –	\$ 194
Participating policyholders	–	(10)	(36)	10	(36)
Shareholders	2,104	(489)	2,916	(2,427)	2,104
	\$ 2,104	\$ (499)	\$ 3,074	\$ (2,417)	\$ 2,262

Consolidated Statement of Cash Flows

For the year ended December 31, 2018	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Operating activities					
Net income (loss)	\$ 4,800	\$ 2,181	\$ 6,060	\$ (8,154)	\$ 4,887
Adjustments:					
Equity in net income of unconsolidated subsidiaries	(4,767)	(1,206)	(2,181)	8,154	–
Increase (decrease) in insurance contract liabilities	–	(5,273)	8,180	–	2,907
Increase (decrease) in investment contract liabilities	–	(86)	121	–	35
(Increase) decrease in reinsurance assets excluding coinsurance transactions	–	1,609	(716)	–	893
Amortization of (premium) discount on invested assets	–	58	154	–	212
Other amortization	4	225	518	–	747
Net realized and unrealized (gains) losses and impairment on assets	(11)	4,158	4,580	–	8,727
Deferred income tax expense (recovery)	11	679	240	–	930
Restructuring charge	–	43	113	–	156
Stock option expense	–	–	10	–	10
Cash provided by (used in) operating activities before undernoted items	37	2,388	17,079	–	19,504
Dividends from unconsolidated subsidiary	2,700	405	777	(3,882)	–
Changes in policy related and operating receivables and payables	251	(536)	(31)	–	(316)
Cash provided by (used in) operating activities	2,988	2,257	17,825	(3,882)	19,188
Investing activities					
Purchases and mortgage advances	–	(38,799)	(62,373)	–	(101,172)
Disposals and repayments	–	35,817	46,294	–	82,111
Changes in investment broker net receivables and payables	–	(169)	41	–	(128)
Investment in common shares of subsidiaries	(1,284)	–	–	1,284	–
Net cash decrease from purchase of subsidiaries and businesses	–	–	187	–	187
Capital contribution to unconsolidated subsidiaries	–	(14)	–	14	–
Return of capital from unconsolidated subsidiaries	–	72	–	(72)	–
Notes receivable from parent	–	–	(83)	83	–
Notes receivable from subsidiaries	(23)	(61)	–	84	–
Cash provided by (used in) investing activities	(1,307)	(3,154)	(15,934)	1,393	(19,002)
Financing activities					
(Decrease) increase in repurchase agreements and securities sold but not yet purchased	–	–	(189)	–	(189)
Redemption of long-term debt	(400)	–	–	–	(400)
Issue of capital instruments, net	597	–	–	–	597
Redemption of capital instruments	–	–	(450)	–	(450)
Secured borrowings from securitization transactions	–	–	250	–	250
Changes in deposits from Bank clients, net	–	–	1,490	–	1,490
Shareholders' dividends paid in cash	(1,788)	–	–	–	(1,788)
Dividends paid to parent	–	(777)	(3,105)	3,882	–
Contributions from (distributions to) non-controlling interests, net	–	–	(60)	–	(60)
Common shares repurchased	(478)	–	–	–	(478)
Common shares issued, net	59	–	1,284	(1,284)	59
Preferred shares issued, net	245	–	–	–	245
Capital contributions by parent	–	–	14	(14)	–
Return of capital to parent	–	–	(72)	72	–
Notes payable to parent	–	–	84	(84)	–
Notes payable to subsidiaries	83	–	–	(83)	–
Cash provided by (used in) financing activities	(1,682)	(777)	(754)	2,489	(724)
Cash and short-term securities					
Increase (decrease) during the year	(1)	(1,674)	1,137	–	(538)
Effect of foreign exchange rate changes on cash and short-term securities	1	353	468	–	822
Balance, beginning of year	21	3,638	11,439	–	15,098
Balance, end of year	21	2,317	13,044	–	15,382
Cash and short-term securities					
Beginning of year					
Gross cash and short-term securities	21	4,133	11,811	–	15,965
Net payments in transit, included in other liabilities	–	(495)	(372)	–	(867)
Net cash and short-term securities, beginning of year	21	3,638	11,439	–	15,098
End of year					
Gross cash and short-term securities	21	2,783	13,411	–	16,215
Net payments in transit, included in other liabilities	–	(466)	(367)	–	(833)
Net cash and short-term securities, end of year	\$ 21	\$ 2,317	\$ 13,044	\$ –	\$ 15,382
Supplemental disclosures on cash flow information:					
Interest received	\$ 427	\$ 4,381	\$ 7,074	\$ (930)	\$ 10,952
Interest paid	373	92	1,677	(930)	1,212
Income taxes paid	(59)	286	234	–	461

Consolidated Statement of Cash Flows

For the year ended December 31, 2017	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Operating activities					
Net income (loss)	\$ 2,104	\$ (499)	\$ 3,074	\$ (2,417)	\$ 2,262
Adjustments:					
Equity in net income of unconsolidated subsidiaries	(2,275)	(628)	486	2,417	—
Increase (decrease) in insurance contract liabilities	—	16,877	3,146	—	20,023
Increase (decrease) in investment contract liabilities	—	55	118	—	173
(Increase) decrease in reinsurance assets	—	(1,890)	4,159	—	2,269
Amortization of (premium) discount on invested assets	—	24	206	—	230
Other amortization	4	123	433	—	560
Net realized and unrealized (gains) losses and impairment on assets	(7)	(2,609)	(4,572)	—	(7,188)
Deferred income tax expense (recovery)	(59)	(2,239)	1,967	—	(331)
Stock option expense	—	(4)	19	—	15
Cash provided by (used in) operating activities before undernoted items	(233)	9,210	9,036	—	18,013
Dividends from unconsolidated subsidiary	2,700	125	1,175	(4,000)	—
Changes in policy related and operating receivables and payables	(45)	(4,627)	4,450	—	(222)
Cash provided by (used in) operating activities	2,422	4,708	14,661	(4,000)	17,791
Investing activities					
Purchases and mortgage advances	—	(30,645)	(56,579)	—	(87,224)
Disposals and repayments	—	26,952	43,768	—	70,720
Changes in investment broker net receivables and payables	—	182	45	—	227
Investment in common shares of subsidiaries	(2,473)	—	—	2,473	—
Net cash decrease from purchase of subsidiaries and businesses	—	—	(10)	—	(10)
Capital contribution to unconsolidated subsidiaries	—	(63)	—	63	—
Return of capital from unconsolidated subsidiaries	—	11	—	(11)	—
Notes receivables from affiliates	—	—	201	(201)	—
Notes receivable from parent	—	368	24	(392)	—
Notes receivable from subsidiaries	(16)	(10)	—	26	—
Cash provided by (used in) investing activities	(2,489)	(3,205)	(12,551)	1,958	(16,287)
Financing activities					
(Decrease) increase in repurchase agreements and securities sold but not yet purchased	—	—	(29)	—	(29)
Redemption of long-term debt	(600)	—	(7)	—	(607)
Issue of capital instruments, net	2,209	—	—	—	2,209
Redemption of capital instruments	—	—	(899)	—	(899)
Secured borrowings from securitization transactions	—	—	741	—	741
Changes in deposits from Bank clients, net	—	—	261	—	261
Shareholders' dividends paid in cash	(1,780)	—	—	—	(1,780)
Contributions from (distributions to) non-controlling interests, net	—	—	(6)	—	(6)
Common shares issued, net	124	—	2,473	(2,473)	124
Dividends paid to parent	—	(1,175)	(2,825)	4,000	—
Capital contributions by parent	—	—	63	(63)	—
Return of capital to parent	—	—	(11)	11	—
Notes payable to affiliates	—	(201)	—	201	—
Notes payable to parent	—	—	26	(26)	—
Notes payable to subsidiaries	(24)	—	(368)	392	—
Cash provided by (used in) financing activities	(71)	(1,376)	(581)	2,042	14
Cash and short-term securities					
Increase (decrease) during the year	(138)	127	1,529	—	1,518
Effect of foreign exchange rate changes on cash and short-term securities	(2)	(276)	(380)	—	(658)
Balance, beginning of year	161	3,787	10,290	—	14,238
Balance, end of year	21	3,638	11,439	—	15,098
Cash and short-term securities					
Beginning of year					
Gross cash and short-term securities	161	4,317	10,673	—	15,151
Net payments in transit, included in other liabilities	—	(530)	(383)	—	(913)
Net cash and short-term securities, beginning of year	161	3,787	10,290	—	14,238
End of year					
Gross cash and short-term securities	21	4,133	11,811	—	15,965
Net payments in transit, included in other liabilities	—	(495)	(372)	—	(867)
Net cash and short-term securities, end of year	\$ 21	\$ 3,638	\$ 11,439	\$ —	\$ 15,098
Supplemental disclosures on cash flow information:					
Interest received	\$ 273	\$ 4,391	\$ 6,504	\$ (572)	\$ 10,596
Interest paid	392	96	1,202	(572)	1,118
Income taxes paid	99	1,084	177	—	1,360

Note 24 Comparatives

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