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

FORM 40-F

(Check One)

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

OR

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

For the fiscal year ended December 31, 2018 **Commission file number 1-14942**

MANULIFE FINANCIAL CORPORATION

(Exact name of Registrant as specified in its charter)

Canada
(Province or other jurisdiction of incorporation or organization)

6311
(Primary Standard Industrial Classification Code Number (if applicable))

Not applicable
(I.R.S. Employer Identification Number (if applicable))

200 Bloor Street East, NT 11, Toronto, Ontario, Canada M4W 1E5
(416) 926-3000
(Address and telephone number of registrant's principal executive offices)

James D. Gallagher, Manulife Financial Corporation, 601 Congress Street, Boston, MA 02210-2805 (617) 663-3000
(Name, address (including zip code) and telephone number
(including area code) of agent for service in the United States)

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

Title of each class	Name of each exchange on which registered
Common Shares	**New York Stock Exchange**

Securities registered or to be registered pursuant to Section 12(g) of the Act. **None**

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act. **4.90% Senior Notes due 2020, 4.150% Senior Notes due 2026, 5.375% Senior Notes due 2046, and 4.061% Subordinated Notes due 2032**

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

☒ **Annual Information Form** ☒ **Audited Annual Financial Statements**

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

Common Shares	**1,971,002,948**
Class A Shares Series 2	**14,000,000**
Class A Shares Series 3	**12,000,000**
Class 1 Shares Series 3	**6,335,831**
Class 1 Shares Series 4	**1,664,169**
Class 1 Shares Series 5	**8,000,000**
Class 1 Shares Series 7	**10,000,000**
Class 1 Shares Series 9	**10,000,000**
Class 1 Shares Series 11	**8,000,000**
Class 1 Shares Series 13	**8,000,000**
Class 1 Shares Series 15	**8,000,000**
Class 1 Shares Series 17	**14,000,000**
Class 1 Shares Series 19	**10,000,000**
Class 1 Shares Series 21	**17,000,000**
Class 1 Shares Series 23	**19,000,000**
Class 1 Shares Series 25	**10,000,000**

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

Yes ☒ No ☐

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files).

Yes ☒ No ☐

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 12b-2 of the Exchange Act.

Emerging Growth Company ☐

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards† provided pursuant to Section 13(a) of the Exchange Act. ☐

† The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Principal Documents

The following documents, filed as exhibits 99.1, 99.2 and 99.3 hereto, are hereby incorporated by reference into this Annual Report:

(a) Consolidated Financial Statements for the fiscal year ended December 31, 2018;

(b) Management's Discussion and Analysis for the fiscal year ended December 31, 2018; and

(c) Annual Information Form dated February 13, 2019 for the fiscal year ended December 31, 2018.

Certifications and Disclosure Regarding Controls and Procedures.

(a) Certifications. The Certificates required by Rule 13a-14(a) and (b) are set forth in Exhibits 99.4, 99.5, 99.6 and 99.7 to this Annual Report on Form 40-F.

(b) Disclosure Controls and Procedures. The conclusions of the principal executive and principal financial officers of Manulife Financial Corporation (the "Company") regarding the effectiveness of the Company's disclosure controls and procedures as at December 31, 2018 are set forth under the heading "Controls and Procedures – Disclosure Controls and Procedures" in the Company's Management's Discussion and Analysis for the fiscal year ended December 31, 2018, filed as Exhibit 99.2 to this Annual Report on Form 40-F.

(c) Management's Annual Report on Internal Control over Financial Reporting. Management's report on the Company's internal control over financial reporting is set forth under the heading "Controls and Procedures – Management's Report on Internal Control over Financial Reporting" in the Company's Management's Discussion and Analysis for the fiscal year ended December 31, 2018, filed as Exhibit 99.2 to this Annual Report on Form 40-F.

(d) Attestation Report of the Registered Public Accounting Firm. Ernst & Young LLP's attestation report on management's assessment of internal control over financial reporting is set forth under the heading "Report of Independent Registered Public Accounting Firm to the Shareholders and Board of Directors on Internal Control Over Financial Reporting" in the Company's Consolidated Financial Statements for the fiscal year ended December 31, 2018, filed as Exhibit 99.1 to this Annual Report on Form 40-F.

(e) Changes in Internal Control over Financial Reporting. Information regarding any changes in the Company's internal control over financial reporting is set forth under the heading "Controls and Procedures – Changes in Internal Control over Financial Reporting" in the Company's Management's Discussion and Analysis for the fiscal year ended December 31, 2018, filed as Exhibit 99.2 to this Annual Report on Form 40-F.

Audit Committee Financial Expert.

Information regarding audit committee financial experts is set forth under the heading "Audit Committee" in the Company's Annual Information Form ("AIF") dated February 13, 2019 for the fiscal year ended December 31, 2018, filed as Exhibit 99.3 to this Annual Report on Form 40-F.

Code of Business Conduct and Ethics.

The Company has adopted a Code of Business Conduct and Ethics ("Code") that applies to all directors, officers and employees of the Company and that qualifies as a "code of ethics" as that term is defined in Form 40-F. The Code is posted on the corporate governance section of our website and is available for viewing at: https://www.manulife.com/content/dam/corporate/global/en/documents/corporate-governance/codeofbusinessconductandethics1.pdf

In 2018, the Company made certain amendments to its Code to clarify several matters, including that all Ethics Hotline Reports are presumed to be made in good faith; that nothing in the Code should be construed as prohibiting communication with any regulator, either voluntarily or in response to a regulatory inquiry; that employees must report discrimination, harassment or violence experienced or observed in the workplace; and to express Manulife's commitment to doing its part to help eradicate human trafficking and its expectation that our business partners will adhere to ethical business conduct consistent with the Company's own. A provision relating to freedom of association was also added to the Code. There were no waivers, including implied waivers, from any provision of the Code during 2018.

Principal Accountant Fees and Services.

Information regarding the fees billed by Ernst & Young LLP is set forth under the heading "Audit Committee – External Auditor Service Fees" in the Company's AIF dated February 13, 2019 for the fiscal year ended December 31, 2018, filed as Exhibit 99.3 to this Annual Report on Form 40-F.

Pre-Approval Policies and Procedures.

Information regarding the pre-approval policies and procedures of the Company's audit committee is set forth under the heading "Audit Committee – Pre-Approval Policies and Procedures" in the Company's AIF dated February 13, 2019 for the fiscal year ended December 31, 2018, filed as Exhibit 99.3 to this Annual Report on Form 40-F.

Hours Expended on Audit Attributed to Persons Other than the Principal Accountant's Employees.

Not Applicable.

Off-Balance Sheet Arrangements.

Information regarding the Company's off-balance sheet arrangements is set forth in the discussion of risk in the Company's Management's Discussion and Analysis for the fiscal year ended December 31, 2018, filed as Exhibit 99.2 to this Annual Report on Form 40-F. The notes to the Consolidated Financial Statements for the fiscal year ended December 31, 2018, filed as Exhibit 99.1 to this Annual Report on Form 40-F include the following disclosures related to off-balance sheet arrangements:

Note 4	Derivative and Hedging Instruments
Note 9	Risk Management - Securities Lending, Repurchase and Reverse Repurchase Transactions
Note 17	Interests in Structured Entities
Note 18	Commitments and Contingencies

Tabular Disclosure of Contractual Obligations.

Information regarding the Company's contractual obligations is set forth under the heading "Contractual Obligations" in the Company's Management's Discussion and Analysis for the fiscal year ended December 31, 2018, filed as Exhibit 99.2 to this Annual Report on Form 40-F.

Identification of the Audit Committee.

Information regarding the Audit Committee of the Company's Board of Directors is set forth under the heading "Audit Committee – Composition of the Audit Committee" in the Company's AIF dated February 13, 2019 for the fiscal year ended December 31, 2018, filed as Exhibit 99.3 to this Annual Report on Form 40-F.

Independence of Directors.

A majority of the directors and all members of the Board's standing committees must be independent so that the Board operates independently of management.

A director is independent if he or she does not have a direct or indirect relationship with the Company that could reasonably be expected to interfere with the director's ability to exercise independent judgment. The Company has established an independence policy for the Board which is consistent with applicable legal and regulatory requirements, including those established under Canadian and U.S. securities law, the *Insurance Companies Act (Canada)* and the rules of the New York Stock Exchange. The independence policy is available on our website (www.manulife.com).

Each year the Board, with the assistance of the Corporate Governance and Nominating Committee, reviews the independence of each director and has determined that 13 of the 14 directors are independent and that the members of the Audit Committee and the Management Resources and Compensation Committee meet the additional independence requirements for those committees. As CEO, Roy Gori is not independent.

Presiding Director at Meetings of Non-Management Directors.

The independent directors meet regularly with senior executives and have an opportunity to meet privately without management present during closed sessions held at each Board and committee meeting. They may also use these sessions to meet privately with members of management or independent advisors.

In addition, the independent directors meet without the CEO present to review the performance and approve the compensation of the CEO, to review the Board's effectiveness assessments and to approve the Board's objectives for the following year.

Communication with Non-Management Directors.

Shareholders wishing to contact non-management Directors of the Company may write to the Chairman of the Board, in care of the Corporate Secretary, at the head office of the Company, 200 Bloor Street East, Toronto, Ontario, Canada, M4W 1E5.

Corporate Governance Guidelines.

The Company's governance practices are consistent in all material respects with the requirements of the *Insurance Companies Act* (Canada), the corporate governance guidelines established by the Office of the Superintendent of Financial Institutions (Canada) and by the Canadian Securities Administrators, the New York Stock Exchange corporate governance rules for domestic issuers and the applicable U.S. Securities and Exchange Commission rules and regulations. The Company's statement of corporate governance practices is posted on the corporate governance section of our website and is available at: http://manulife.force.com/servlet/servlet.FileDownload?file=00P50000010BL5nEAG&ver=10

Board Committee Charters.

The Board has established four standing committees to assist it in fulfilling its mandate: Corporate Governance and Nominating Committee, Audit Committee, Risk Committee, and Management Resources and Compensation Committee.

All of the members of the standing committees are independent. Each committee reviews and, as necessary, updates its charter every year and monitors compliance with its charter on a regular basis throughout the year. Each committee chair reports to the Board on the committee's deliberations and any recommendations that require Board approval.

The committee charters and the position description for each committee chair are posted on the corporate governance section of our website and are available at: https://www.manulife.com/en/about/corporate-governance/board-committees.html

Mine Safety Disclosure.

Not applicable.

UNDERTAKING AND CONSENT TO SERVICE OF PROCESS

A. Undertaking.

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

B. Consent to Service of Process.

The Company has previously filed a Form F-X in connection with the class of securities in relation to which the obligation to file this Annual Report arises.

Any change to the name or address of the Registrant's agent for service of process shall be communicated promptly to the Securities and Exchange Commission by an amendment to the Form F-X referencing the file number of the relevant registration statement of the Registrant.

SIGNATURES

Pursuant to the requirements of the Exchange Act, the Registrant certifies that it meets all of the requirements for filing on Form 40-F and has duly caused this Annual Report to be signed on its behalf by the undersigned, thereto duly authorized, on February 13, 2019.

Manulife Financial Corporation

By: */s/ James D. Gallagher*
Name: James D. Gallagher
Title: General Counsel

EXHIBIT INDEX

Exhibit	Description
99.1	Consolidated Financial Statements for the fiscal year ended December 31, 2018
99.2	Management's Discussion and Analysis for the fiscal year ended December 31, 2018
99.3	Annual Information Form dated February 13, 2019 for the fiscal year ended December 31, 2018
99.4	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934
99.5	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934
99.6	Section 1350 Certification of Chief Executive Officer
99.7	Section 1350 Certification of Chief Financial Officer
99.8	Consent of Independent Registered Public Accounting Firm
99.9	Consent of Appointed Actuary
101	Interactive Data File
	mfc-20181231.xml
	mfc-20181231.xsd
	mfc-20181231_cal.xml
	mfc-20181231_def.xml
	mfc-20181231_lab.xml
	mfc-20181231_pre.xml

Exhibit 99.1



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.

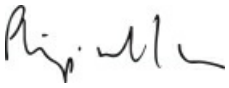
The Board of Directors is responsible for ensuring that management fulfills its responsibility for financial reporting and is ultimately responsible for reviewing and approving the consolidated financial statements. These responsibilities are carried out primarily through an Audit Committee of unrelated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

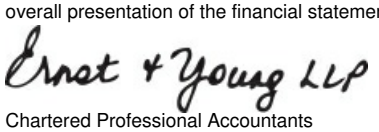
Report on Internal Control over Financial Reporting

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.



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.

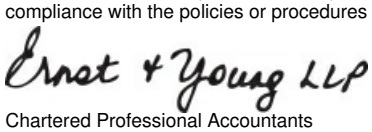
We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

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.



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 onavailable-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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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 thevalue-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 tore-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.

	2018		2017	
As at December 31,	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	Securitized assets			
Securitization program	Securitized mortgages	Restricted cash and short-term securities	Total	Secured borrowing liabilities[2]
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	Securitized assets			
Securitization program	Securitized mortgages	Restricted cash and short-term securities	Total	Secured borrowing liabilities[2]
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)**

For the year ended December 31, 2017	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
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		
		Notional	Fair value		Notional	Fair value	
Type of hedge	Instrument type	amount	Assets	Liabilities	amount	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.

	Remaining term to maturity				
As at December 31, 2018	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**

	Remaining term to maturity				
As at December 31, 2017	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.

As at December 31, 2018	Remaining term to maturity (notional amounts)				Fair value				
	Under 1 year	1 to 5 years	Over 5 years	Total	Positive	Negative	Net	Credit risk equivalent(1)	Risk-weighted amount(2)
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**

As at December 31, 2017	Remaining term to maturity (notional amounts)				Fair value				
	Under 1 year	1 to 5 years	Over 5 years	Total	Positive	Negative	Net	Credit risk equivalent(1)	Risk-weighted amount(2)
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.

For the year ended December 31, 2018	Hedged items in qualifying fair value hedging relationships	Gains (losses) recognized on derivatives	Gains (losses) recognized for hedged items	Ineffectiveness recognized in investment income
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**

For the year ended December 31, 2017	Hedged items in qualifying fair value hedging relationships	Gains (losses) recognized on derivatives	Gains (losses) recognized for hedged items	Ineffectiveness recognized in investment income
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.

For the year ended December 31, 2018	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
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**	**$ –**

For the year ended December 31, 2017	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
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 andnon-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.

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

For the year ended December 31, 2017	Gains (losses) deferred in AOCI on derivatives	Gains (losses) reclassified from AOCI into investment income	Ineffectiveness recognized in investment income
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 Managment				
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 Managment				
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 fromin-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 anafter-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 anafter-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

As at December 31, 2018	Individual insurance		Annuities and pensions	Other insurance contract liabilities(1)	Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
	Participating	Non-participating					
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**		

As at December 31, 2017	Individual insurance		Annuities and pensions	Other insurance contract liabilities(1)	Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
	Participating	Non-participating					
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: Participating	Individual insurance: Non-participating	Annuities and pensions	Other insurance contract liabilities(1)	Other liabilities(2)	Capital(3)	Total
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: Participating	Individual insurance: Non-participating	Annuities and pensions	Other insurance contract liabilities(1)	Other liabilities(2)	Capital(3)	Total
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. 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.	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.

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 innon-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 tonon-economic assumptions(1)

	Decrease in net income attributed to shareholders	
As at December 31,	**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 tonon-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.

For the year ended December 31, 2018	Net actuarial liabilities	Other insurance contract liabilities[1]	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
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**

For the year ended December 31, 2017	Net actuarial liabilities	Other insurance contract liabilities[1]	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
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			
For the year ended December 31, 2018	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	Change in net income attributed to shareholders (post-tax)
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			
For the year ended December 31, 2017	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	Change in net income attributed to shareholders (post-tax)
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	
As at December 31,	Amortized cost, gross of reinsurance ceded(1)	Fair value	Amortized cost, gross of reinsurance ceded(1)	Fair value
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 labilities 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 labilities 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.

	2018[1]			2017		
As at December 31,	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: Less than 90 days	Past due but not impaired: 90 days and greater	Past due but not impaired: Total	Total impaired
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: Less than 90 days	Past due but not impaired: 90 days and greater	Past due but not impaired: Total	Total impaired
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: Private placements	2018: Mortgages and loans to Bank clients	2018: Total	2017: Private placements	2017: Mortgages and loans to Bank clients	2017: 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.

As at December 31, 2018	Gross amounts of financial instruments[1]	Related amounts not set off in the Consolidated Statements of Financial Position: Amounts subject to an enforceable master netting arrangement or similar agreements	Related amounts not set off in the Consolidated Statements of Financial Position: Financial and cash collateral pledged (received)[2]	Net amount including financing trusts[3]	Net amounts excluding financing trusts
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)**

As at December 31, 2017	Gross amounts of financial instruments[1]	Related amounts not set off in the Consolidated Statements of Financial Position: Amounts subject to an enforceable master netting arrangement or similar agreements	Related amounts not set off in the Consolidated Statements of Financial Position: Financial and cash collateral pledged (received)[2]	Net amount including financing trusts[3]	Net amounts excluding financing trusts
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.

As at December 31, 2018	Gross amounts of financial instruments	Amounts subject to an enforceable netting arrangement	Net amounts of financial instruments
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.

	2018		2017	
As at December 31,	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 uncallable 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 ("MHDLL"), now John Hancock Financial Corporation ("JHFC"), a wholly owned subsidiary of MFC, to Manulife Finance (Delaware) LLC ("MFLLC"), 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	
For the years ended December 31,	Number of shares (in millions)	Amount	Number of shares (in millions)	Amount
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.

For the years ended December 31,	2018 Number of shares (in millions)	2018 Amount	2017 Number of shares (in millions)	2017 Amount
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

For the years ended December 31,	2018 Number of options (in millions)	2018 Weighted average exercise price	2017 Number of options (in millions)	2017 Weighted average exercise price
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		
For the year ended December 31, 2018	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)
$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, Number of DSUs (in thousands)	**2018**	2017
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 closednon-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

	Pension plans		Retiree welfare plans	
For the years ended December 31,	**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 2018	Pension plans 2017	Retiree welfare plans 2018	Retiree welfare plans 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 2018	Pension plans 2017	Retiree welfare plans 2018	Retiree welfare plans 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

	U.S. plans				Canadian plans			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
As at December 31,	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.

	U.S. plans[1]				Canadian plans[2]			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
As at December 31, 2018	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%**	**$ –**	**–**

	U.S. plans[1]				Canadian plans[2]			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
As at December 31, 2017	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.

	Pension plans		Retiree welfare plans	
For the years ended December 31,	**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

	Pension plans		Retiree welfare plans	
For the years ended December 31,	**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.

	U.S. Plans				Canadian Plans			
	Pension plans		Retiree welfare plans		Pension plans		Retiree welfare plans	
For the years ended December 31,	**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.

	Pension plans		Retiree welfare plans	
As at December 31,	**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.

	Pension plans		Retiree welfare plans	
For the years ended December 31,	**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.

	Company's investment[1]		Company's maximum exposure to loss[2]	
As at December 31,	**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.

	Company's interests[1]	
As at December 31,	**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 CMBS	2018 RMBS	2018 ABS	2018 Total	2017 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

For the year ended December 31, 2018	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
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**

For the year ended December 31, 2017	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
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

As at December 31, 2018	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
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**

As at December 31, 2017	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidation adjustments	Total consolidated amounts	MFLP
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.

	Ranges in per cent	
Type of fund	**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 *Signature*Notes 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 *Signature*Notes 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 *Signature* Notes issued by the Life Company.

MFC fully and unconditionally guaranteed the payment of JHUSA's obligations under the MVAs and under the *Signature* Notes (including the MVAs and *Signature* Notes assumed by JHUSA in the merger), and such MVAs and the *Signature* Notes were registered with the Commission. The *Signature* Notes 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 *Signature* Notes 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 *Signature* Notes 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.

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Exhibit 99.2



Manulife Financial Corporation

Management's Discussion & Analysis

For the year ended December 31, 2018

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Caution regarding forward-looking statements

From time to time, Manulife Financial Corporation ("MFC") makes written and/or oral forward-looking statements, including in this document. In addition, our representatives may make forward-looking statements orally to analysts, investors, the media and others. All such statements are made pursuant to the "safe harbour" provisions of Canadian provincial securities laws and the U.S. Private Securities Litigation Reform Act of 1995.

The forward-looking statements in this document include, but are not limited to, statements with respect to the Company's strategic priorities and 2022 targets for net promoter score, employee engagement, its highest potential businesses, expense efficiency and portfolio optimization; the reduction in the allocation to alternative long-duration assets in our portfolio asset mix supporting our legacy business by mid-2019; and the annual pre-tax run-rate savings to be achieved by the end of 2019, and also relate to, among other things, our objectives, goals, strategies, intentions, plans, beliefs, expectations and estimates, and can generally be identified by the use of words such as "may", "will", "could", "should", "would", "likely", "suspect", "outlook", "expect", "intend", "estimate", "anticipate", "believe", "plan", "forecast", "objective", "seek", "aim", "continue", "goal", "restore", "embark" and "endeavour" (or the negative thereof) and words and expressions of similar import, and include statements concerning possible or assumed future results. Although we believe that the expectations reflected in such forward-looking statements are reasonable, such statements involve risks and uncertainties, and undue reliance should not be placed on such statements and they should not be interpreted as confirming market or analysts' expectations in any way.

Certain material factors or assumptions are applied in making forward-looking statements and actual results may differ materially from those expressed or implied in such statements. Important factors that could cause actual results to differ materially from expectations include but are not limited to: general business and economic conditions (including but not limited to the performance, volatility and correlation of equity markets, interest rates, credit and swap spreads, currency rates, investment losses and defaults, market liquidity and creditworthiness of guarantors, reinsurers and counterparties); changes in laws and regulations; changes in accounting standards applicable in any of the territories in which we operate; changes in regulatory capital requirements; our ability to execute strategic plans and changes to strategic plans; downgrades in our financial strength or credit ratings; our ability to maintain our reputation; impairments of goodwill or intangible assets or the establishment of provisions against future tax assets; the accuracy of estimates relating to morbidity, mortality and policyholder behaviour; the accuracy of other estimates used in applying accounting policies, actuarial methods and embedded value methods; our ability to implement effective hedging strategies and unforeseen consequences arising from such strategies; our ability to source appropriate assets to back our long-dated liabilities; level of competition and consolidation; our ability to market and distribute products through current and future distribution channels; unforeseen liabilities or asset impairments arising from acquisitions and dispositions of businesses; the realization of losses arising from the sale of investments classified as available-for-sale; our liquidity, including the availability of financing to satisfy existing financial liabilities on expected maturity dates when required; obligations to pledge additional collateral; the availability of letters of credit to provide capital management flexibility; accuracy of information received from counterparties and the ability of counterparties to meet their obligations; the availability, affordability and adequacy of reinsurance; legal and regulatory proceedings, including tax audits, tax litigation or similar proceedings; our ability to adapt products and services to the changing market; our ability to attract and retain key executives, employees and agents; the appropriate use and interpretation of complex models or deficiencies in models used; political, legal, operational and other risks associated with our non-North American operations; acquisitions and our ability to complete acquisitions including the availability of equity and debt financing for this purpose; the disruption of or changes to key elements of the Company's or public infrastructure systems; environmental concerns; our ability to protect our intellectual property and exposure to claims of infringement; and our inability to withdraw cash from subsidiaries.

Additional information about material risk factors that could cause actual results to differ materially from expectations and about material factors or assumptions applied in making forward-looking statements may be found in this document under "Risk Management", "Risk Factors" and "Critical Accounting and Actuarial Policies" and in the "Risk Management" note to the Consolidated Financial Statements as well as elsewhere in our filings with Canadian and U.S. securities regulators. The forward-looking statements in this document are, unless otherwise indicated, stated as of the date hereof and are presented for the purpose of assisting investors and others in understanding our financial position and results of operations, our future operations, as well as our objectives and strategic priorities, and may not be appropriate for other purposes. We do not undertake to update any forward-looking statements, except as required by law.

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Management's Discussion and Analysis

This Management's Discussion and Analysis ("MD&A") is current as of February 13, 2019.

Manulife Financial Corporation

Manulife Financial Corporation is a leading international financial services group that helps people make their decisions easier and lives better. We operate as John Hancock in the United States and Manulife elsewhere. We provide financial advice, insurance, as well as wealth and asset management solutions for individuals, groups and institutions. At the end of 2018, we had more than 34,000 employees, over 82,000 agents, and thousands of distribution partners, serving almost 28 million customers. At the end of 2018, we had $1.1 trillion (US$794 billion) in assets under management and administration, and during 2018, we made $29.0 billion in payments to our customers. Our principal operations are in Asia, Canada and the United States where we have served customers for more than 100 years. With our global headquarters in Toronto, Canada, we trade as 'MFC' on the Toronto, New York, and the Philippine stock exchanges, and under '945' in Hong Kong.

Effective January 1, 2018, the Company introduced Global Wealth and Asset Management as a primary reporting segment. This change reflected organizational changes made to drive better alignment with our strategic priorities as well as to increase focus and leverage scale in our global wealth and asset management businesses.

Our reporting segments are:

- Asia – providing insurance products and insurance-based wealth accumulation products in Asia.
- Canada – providing insurance products, insurance-based wealth accumulation products, and banking services in Canada.
- U.S. – providing life insurance products, insurance-based wealth accumulation products, digital advice solutions, and administering in-force long-term care insurance and our annuity businesses in the U.S.
- Global Wealth and Asset Management ("Global WAM") – providing fee-based wealth solutions to our retail, retirement and institutional customers around the world.
- Corporate and Other – comprised of investment performance on assets backing capital, net of amounts allocated to operating segments; financing costs; costs incurred by the corporate office related to shareholder activities (not allocated to operating segments); our Property and Casualty ("P&C") Reinsurance business; and run-off reinsurance business lines.

In this document, the terms "Company", "Manulife", "we" and "our" mean Manulife Financial Corporation ("MFC") and its subsidiaries. The term "MLI" means The Manufacturers Life Insurance Company and its subsidiaries.

In 2018, we executed against the five priorities of our strategy that we outlined in late 2017 and at our Investor Day in June. Progress made on each of these priorities is described in the "Strategic Highlights" section below.

Profitability

Profitability

As at and for the years ended December 31, ($ millions, unless otherwise stated)	2018	2017	2016
Net income attributed to shareholders	**$ 4,800**	$ 2,104	$ 2,929
Core earnings(1)	**$ 5,610**	$ 4,565	$ 4,021
Diluted earnings per common share ($)	**$ 2.33**	$ 0.98	$ 1.41
Diluted core earnings per common share ($)(1)	**$ 2.74**	$ 2.22	$ 1.96
Return on common shareholders' equity ("ROE")	**11.6%**	5.0%	7.3%
Core ROE(1)	**13.7%**	11.3%	10.1%
Expense efficiency ratio(1)	**52.0%**	55.4%	59.3%

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

Our net income attributed to shareholders was $4.8 billion in 2018 compared with $2.1 billion in 2017. Net income attributed to shareholders is comprised of core earnings[1] (consisting of items we believe reflect the underlying earnings capacity of the business), which amounted to $5.6 billion in 2018 compared with $4.6 billion in 2017, and items excluded from core earnings of $0.8 billion of net charges in 2018 compared with $2.5 billion of net charges in 2017.

Net income attributed to shareholders was $4.8 billion in 2018, an increase of $2.7 billion compared with 2017. The increase was due to the non-recurrence of the $2.8 billion charge in 2017 related to the impact of the U.S. Tax Cuts and Jobs Act ("U.S. Tax Reform") and our decision to change the portfolio asset mix supporting our legacy businesses as well as strong core earnings growth, partially offset by charges in 2018 primarily related to the direct impact of equity markets.

The $1.0 billion increase in core earnings compared with 2017 was driven by improved policyholder experience and the non-recurrence of 2017's hurricane-related charges in our P&C business, business growth in Asia and Global WAM, the impact of lower U.S. tax rates, and greater expense efficiency. These were partially offset by lower gains from the release of provisions for

[1] This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

uncertain tax positions and the unfavourable impact of markets, in 2018, on seed money investments in new segregated and mutual funds. Core earnings in 2018 included policyholder experience gains of $38 million post-tax ($64 million pre-tax) compared with charges of $168 million post-tax ($227 million pre-tax) in 2017.[1]

Actions to optimize our portfolio and to put our capital to best use have an impact on core earnings until such time as the capital benefit is redeployed. In 2018, we estimate the impact on core earnings of reducing the allocation of alternative long-duration assets ("ALDA") in our portfolio asset mix supporting our North American legacy businesses and of the reinsurance transactions in 2018 related to legacy businesses to be a reduction of approximately $65 million and expect a further impact on 2019 core earnings of approximately $100 million.[2]

As noted in the table below, we reported double-digit core earnings growth across all operating segments. See Asia, Canada, U.S., and Global WAM sections below.

For the years ended December 31, ($ millions)	2018	2017	% change(1) 2018 vs 2017	2016
Core earnings(2)				
Asia	**$ 1,749**	$ 1,453	20	$ 1,321
Canada	**1,356**	1,209	12	1,191
U.S.	**1,830**	1,609	14	1,317
Global Wealth and Asset Management	**986**	816	21	662
Corporate and Other (excluding core investment gains)	**(711)**	(922)	23	(667)
Core investment gains(3)	**400**	400	–	197
Total core earnings	**$ 5,610**	$ 4,565	23	$ 4,021

(1) Percentage change is on a constant exchange rate basis. See "Performance and Non-GAAP Measures" below.
(2) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
(3) See note (2) in the table below.

The table below reconciles 2018, 2017 and 2016 net income attributed to shareholders to core earnings and provides further details for each of the items excluded from core earnings.

For the years ended December 31, ($ millions)	2018	2017	2016
Core earnings(1)	**$ 5,610**	$ 4,565	$ 4,021
Items excluded from core earnings			
Investment-related experience outside of core earnings(2)	**200**	167	–
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities(3) (see table below)	**(857)**	209	(484)
Change in actuarial methods and assumptions(4)	**(51)**	(35)	(453)
Impact related to U.S. Tax Reform(5)	**124**	(1,777)	–
Charge related to decision to change portfolio asset mix supporting our legacy businesses(6)	**–**	(1,032)	–
Restructuring charge(7)	**(263)**	–	–
Reinsurance transactions and other(8)	**37**	7	(155)
Total items excluded from core earnings	**(810)**	(2,461)	(1,092)
Net income attributed to shareholders	**$ 4,800**	$ 2,104	$ 2,929

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
(2) In accordance with our definition of core earnings, we include up to $400 million of net favourable investment-related experience reported in a single year, as core investment gains (see "Performance and Non-GAAP Measures" below). Items excluded from core earnings include net investment-related experience in excess of $400 million per annum or net unfavourable investment-related experience on a year-to-date basis. In 2018, we generated investment-related experience gains of $600 million, reflecting the favourable impact of fixed income reinvestment activities on the measurement of our policy liabilities and strong credit experience, partially offset by lower than expected returns (including changes in fair value) on alternative long-duration assets ("ALDA"), including oil & gas in the fourth quarter. In 2017, we generated investment-related experience gains of $567 million, reflecting the favourable impact of fixed income reinvestment activities on the measurement of our policy liabilities and strong credit experience, partially offset by lower than expected returns (including changes in fair value) on ALDA.
(3) The direct impact of equity markets and interest rates is relative to our policy liability valuation assumptions and includes changes to interest rate assumptions, as well as experience gains and losses on derivatives associated with our macro equity hedges. We also include gains and losses on the sale of AFS debt securities as management may have the ability to partially offset the direct impacts of changes in interest rates reported in the liability segments. Additional information related to the charge in 2018 and gain in 2017 are included in the table below.
(4) The impact of our review of actuarial methods and assumptions in 2018 resulted in a net charge to net income attributed to shareholders of $51 million. Reserves were strengthened for policyholder experience assumptions and we recorded a net favourable impact from the review of investment assumptions and other updates. (See "Critical Actuarial and Accounting Policies – Review of Actuarial Methods and Assumptions" section below for further information on the 2018 and 2017 charges.
(5) The 2017 charge of $1.8 billion related to the impact of U.S. Tax Reform, which lowered the U.S. corporate tax rate from 35% to 21% and placed limits on the tax deductibility of reserves. In 2018 we updated our estimate and reported a gain of $124 million.
(6) The 2017 charge reflected a $1.0 billion post-tax charge related to our decision to reduce the allocation to ALDA in our portfolio asset mix supporting our North American legacy businesses.
(7) The 2018 charge of $263 million primarily related to the voluntary exit program in our Canadian operation transformation program and to our North American voluntary early retirement program as well as costs to optimize our real estate footprint in the U.S. and Canada. For further information on the restructuring change see "Strategic Highlights" below.
(8) The 2018 gain of $37 million includes a gain resulting from external reinsurance transactions partially offset by a provision for a legal settlement in the U.S. and a charge related to the integration of businesses acquired from Standard Chartered and Standard Life plc. The 2017 net gain of $7 million included a gain resulting from an internal legal entity restructuring partially offset by a provision for a legal settlement, Thailand operations restructuring charges, early redemption costs on debt retirements and costs related to the integration of businesses acquired from Standard Chartered and Standard Life plc. The 2016 charge of $155 million includes restructuring charges for our long-term care business in the U.S., our Indonesia operations and the closure of our technology shared service centre in Malaysia and charge related to the integration of New York Life's ("NYL") Retirement Plan Services business, partially offset by a gain with respect to one of the Company's pension plans.

1 Effective 2018, policyholder experience is being reported excluding minority interest. Comparative prior periods have been updated.
2 See "Caution related to forward-looking statements" above.

The net gain (loss) related to the direct impact of equity markets and interest rates and variable annuity guarantee liabilities in the table above is attributable to:

For the years ended December 31, ($ millions)	2018	2017	2016
Direct impact of equity markets and variable annuity guarantee liabilities[1]	**$ (928)**	$ 533	$ (364)
Fixed income reinvestment rates assumed in the valuation of policy liabilities[2]	**354**	(200)	(335)
Sale of AFS bonds and derivative positions in the Corporate and Other segment	**(283)**	(41)	370
Risk reduction related items[3]	**–**	(83)	(155)
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	**$ (857)**	$ 209	$ (484)

(1) In 2018, the net loss of $928 million included a loss of $1,718 million from gross equity exposure, partially offset by gain of $767 million from dynamic hedging experience and $23 million from macro hedge experience. In 2017, the net gain of $533 million included a gain of $1,486 million from gross equity exposure, partially offset by charges of $892 million from dynamic hedging experience and $61 million from macro hedge experience.

(2) In 2018, the $354 million gain for fixed income reinvestment assumptions was driven primarily by the increases in corporate spreads which resulted in an increase in the reinvestment yields on future fixed income purchases assumed in the measurement of policy liabilities partially offset by movement in risk free rates and increases in swap spreads that resulted in a decrease in the fair value of our swaps. In 2017, the $200 million charge was driven by decreases in corporate spreads which resulted in a decline in the reinvestment yields on future fixed income purchases assumed in the measurement of policy liabilities and increases in swap spreads that resulted in a decrease in the fair value of our swaps.

(3) There were no specific actions in 2018. In 2017, we expanded our dynamic hedging program in Japan.

Earnings per common share

Diluted earnings per common share was $2.33 in 2018, compared with $0.98 in 2017. Diluted core earnings per common share was $2.74 in 2018, compared with $2.22 in 2017. The changes in these measures were related to the increase in both net income and core earnings, respectively. The diluted weighted average common shares outstanding was 1,988 million in 2018 and 1,986 million in 2017.

Return on common shareholders' equity

Return on common shareholders' equity ("ROE") for 2018 was 11.6%, compared with 5.0% for 2017 and core return on shareholders' equity ("core ROE")[1] was 13.7% in 2018 compared with 11.3% in 2017. The changes were driven by increased earnings. Average common equity increased 2% to $39.8 billion in 2018 from $38.9 billion in 2017.

Expense efficiency ratio was 52.0% for 2018, compared with 55.4% in 2017. Growth of general expenses included in core earnings was 3%, while pre-tax core earnings grew 19%, resulting in the 3.4 percentage point improvement in our expense efficiency ratio.

Growth

Growth metrics

As at and for the years ended December 31, ($ millions, unless otherwise stated)	2018	2017	2016
Asia APE sales	**$ 4,012**	$ 3,747	$ 3,307
Canada APE sales	**975**	1,366	978
U.S. APE sales	**553**	603	608
Total APE sales[1]	**5,540**	5,716	4,893
Asia new business value	**1,443**	1,201	998
Canada new business value	**207**	191	139
U.S. new business value	**98**	51	59
Total new business value[1]	**1,748**	1,443	1,196
Wealth and asset management gross flows ($ billions)[1]	**119.0**	122.0	118.2
Wealth and asset management net flows ($ billions)[1]	**1.6**	18.3	16.5
Wealth and asset management assets under management and administration ($ billions)[1]	**608.8**	609.0	554.1
Total assets under management and administration ($ billions)[1]	**1,083.5**	1,071.3	1,004.8

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

Annualized premium equivalent ("APE") sales[1] were $5,540 billion in 2018, a decrease of 3%[2] compared with 2017. In Asia, APE sales increased 6% in 2018 compared with 2017 driven by growth in most markets, including a 20% growth in sales through DBS Bank. 2018 APE sales in Japan declined 3% compared with 2017, as the impact of competitive pressure during the first half of the year was largely offset by strong sales of our newly-launched corporate-owned life insurance ("COLI") term product in the second half of the year. Hong Kong APE sales increased 11% in 2018 compared with 2017, driven by growth in both our agency and bancassurance channels. Asia Other[3] APE sales in 2018 increased 13% compared with 2017 as higher sales of protection products were partially offset by lower sales of single premium investment-linked products, reflecting market volatility in 2018. In Canada, 2018 APE sales declined 29% compared with 2017, due to lower large-case group insurance sales. Canadian Individual insurance sales were in line with 2017 as benefits from the launch of Manulife Par offset the impact of price increases in the prior year. In the U.S., APE sales declined 8% in 2018 compared with 2017 driven by increased competition in the international high net worth segment and actions to maintain margins.

1 This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
2 Percentage growth / declines in APE sales, gross flows, NBV, assets under management and administration, core earnings, assets under management and core EBITDA are stated on a constant exchange rate basis. Constant exchange rate basis is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
3 Asia Other excludes Japan and Hong Kong.

New business value ("NBV")[1] was $1.7 billion in 2018, an increase of 20% compared with 2017. In Asia, NBV increased 19% from 2017 to $1.4 billion due to higher sales, scale benefits and a favourable business mix. Canada NBV increased 8% to $207 million as the benefits from the launch of Manulife Par and product repricing were partially offset by lower group insurance sales. U.S. NBV increased 90% to $98 million driven by product repricing to improve margins.

WAM gross flows[1] were $119 billion in 2018, a decrease of 2% compared with 2017. The decrease was mainly driven by a slowdown in U.S. retail gross flows amid equity market declines and lower gross flows in mainland China from retail money market funds. This was partially offset by growth of $5.4 billion in institutional asset management driven by the launch of the John Hancock Infrastructure Fund and a real estate separately managed account, and the funding of two large fixed income mandates.

WAM net flows[1] were $1.6 billion in 2018, compared with $18.3 billion in 2017. Net flows in Asia were $5.7 billion in 2018 compared with net flows of $6.6 billion in 2017, driven by lower gross flows in mainland China from retail money market funds. Net flows in Canada were $2.0 billion in 2018 compared with net flows of $3.7 billion in 2017, driven by higher retail redemptions. Net flows in the U.S. were negative $6.1 billion in 2018 compared with positive net flows of $7.9 billion in 2017, driven by higher retail redemptions amid the declines in equity markets.

Assets under Management and Administration ("AUMA") [1]

AUMA as at December 31, 2018 was $1,084 billion as at December 31, 2018, a decrease of 5%, compared with December 31, 2017, primarily due to the challenging macro-economic conditions in the fourth quarter of 2018. The Global Wealth and Asset Management portion of AUMA as at December 31, 2018 was $609 billion, a decrease of 6%, compared with December 31, 2017, driven by the same reason.

Assets under Management and Administration

As at December 31, ($ millions)	2018	2017	2016
General fund	**$ 353,664**	$ 334,222	$ 321,869
Segregated funds net assets(1)	**313,209**	324,307	315,177
Mutual funds, institutional asset management and other(1),(2)	**292,200**	289,559	255,685
Total assets under management	**959,073**	948,088	892,731
Other assets under administration	**124,449**	123,188	112,072
Total assets under management and administration	**$ 1,083,522**	$ 1,071,276	$ 1,004,803

(1) Segregated fund assets, mutual fund assets and other funds are not available to satisfy the liabilities of the Company's general fund.
(2) Other funds represent pension funds, pooled funds, endowment funds and other institutional funds managed by the Company on behalf of others.

Revenue

Revenue includes (i) premiums received on life and health insurance policies and fixed annuity products, net of premiums ceded to reinsurers; (ii) investment income comprised of income earned on general fund assets, credit experience and realized gains and losses on assets held in the Corporate segment; (iii) fee and other income received for services provided; and (iv) realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities and on our macro hedging program. Premium equivalents from administrative services only ("ASO"), as well as deposits received by the Company on investment contracts such as segregated funds, mutual funds and managed funds are not included in revenue; however, the Company does receive fee income from these products, which is included in revenue. Fees generated from deposits and ASO premium and deposit equivalents are an important part of our business and as a result, revenue does not fully represent sales and other activity taking place during the respective periods.

For 2018, revenue before realized and unrealized investment gains and losses was $48.0 billion compared with $52.6 billion in 2017. The decrease was due to the net impact on ceded premiums of reinsuring a block of our legacy U.S. individual pay-out annuity business in 2018 and a change to a reinsurance agreement in Canada Group Benefits, partially offset by business growth in Asia.

In 2018, the net realized and unrealized investment losses on assets supporting insurance and investment contract liabilities and on the macro hedging program were $9.0 billion compared with a gain of $5.7 billion for full year 2017. The full year 2018 loss largely resulted from interest rate increases in both North America and Asia. Additional losses were driven by declining equity markets as all major indices were down during the year. In 2017, the net realized and unrealized investment gains on assets supporting insurance and investment contract liabilities and on the macro hedging program were $5.7 billion, primarily driven by the decline in Canadian, U.S. and Hong Kong interest rates.

See "Impact of Fair Value Accounting" below.

1 This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

Revenue

For the years ended December 31, ($ millions)	2018	2017	2016
Gross premiums	**$ 39,150**	$ 36,361	$ 36,659
Premiums ceded to reinsurers	**(15,138)**	(8,151)	(9,027)
Net premium income	**24,012**	28,210	27,632
Investment income	**13,560**	13,649	13,390
Other revenue	**10,428**	10,746	11,181
Revenue before realized and unrealized investment gains and losses	**48,000**	52,605	52,203
Realized and unrealized investment gains and losses on assets supporting insurance and investment contract liabilities and on the macro hedge program	**(9,028)**	5,718	1,134
Total revenue	**$ 38,972**	$ 58,323	$ 53,337

Financial Strength

Financial strength metrics

As at and for the years ended December 31, ($ millions, unless otherwise stated)	2018	2017	2016
MLI's LICAT total ratio(1)	**143%**	n/a	n/a
Financial leverage ratio	**28.6%**	30.3%	29.5%
Consolidated capital	**$56,010**	$50,659	$50,235
Book value per common share ($)	**$ 21.38**	$ 18.89	$ 19.37
Book value per common share excluding accumulated other comprehensive income ("AOCI") ($)	**$ 18.23**	$ 16.83	$ 16.66

(1) The Life Insurance Capital Adequacy Test ("LICAT") framework replaced the Minimum Continuing Capital and Surplus Requirements ("MCCSR") framework on January 1, 2018.

The Life Insurance Capital Adequacy Test ("LICAT") total ratio for MLI was 143% as at December 31, 2018, compared with a supervisory target of 100%. As this was the first year of the Office of Superintendent of Financial Institutions' new LICAT framework, replacing the Minimum Continuing Capital and Surplus framework, there are no prior year comparatives. See the "Capital Management Framework – Regulatory Capital Position" section below.

Consolidated capital

Consolidated capital[1] was $56.0 billion as at December 31, 2018 compared with $50.7 billion as at December 31, 2017, an increase of approximately $5.3 billion. The increase from December 31, 2017 was primarily driven by net income attributed to shareholders net of dividends paid of $2.9 billion, net capital issuances of approximately $100 million consisting of net subordinated debt and preferred shares issuances less the net impact of share buybacks and issuance of shares for the dividend reinvestment program (as senior debt is not included in the definition of capital, the $400 million of senior debt redeemed in 2018 did not impact the change in capital), and the net increase in AOCI. The net increase in AOCI was due to a weaker Canadian dollar compared to the U.S. dollar, partially offset by the impact of higher interest rates and lower equity markets on assets classified as AFS.

MFC's financial leverage ratio decreased to 28.6% as at December 31, 2018 from 30.3% as at December 31, 2017, driven by the increase of $5.0 billion in equity, supported by earnings and the impact of a weaker Canadian dollar compared with the U.S. dollar.

Book value per common share

Book value per common share as at December 31, 2018 was $21.38, an increase of 13% compared with $18.89 as at December 31, 2017, and the book value per common share excluding AOCI was $18.23 as at December 31, 2018, an increase of 8% compared with $16.83 as at December 31, 2017. The increase in the book value per common share is due to the $5.0 billion increase in equity which included a $2.1 billion increase in AOCI. The number of common shares outstanding was 1,971 million as at December 31, 2018 and was 1,982 million as at December 31, 2017.

Impact of Fair Value Accounting

Fair value accounting policies affect the measurement of both our assets and our liabilities. The difference between the reported amounts of our assets and liabilities determined as of the balance sheet date and the immediately preceding balance sheet date in accordance with the applicable mark-to-market accounting principles is reported as investment-related experience and the direct impact of equity markets and interest rates and variable annuity guarantees, each of which impacts net income.

We reported $9.0 billion of net realized and unrealized investment losses in investment income in 2018 (2017 – gains of $5.7 billion).

As outlined under "Critical Actuarial and Accounting Policies" below, net insurance contract liabilities under IFRS are determined using Canadian Asset Liability Method ("CALM"), as required by the Canadian Institute of Actuaries ("CIA"). The measurement of policy liabilities includes the estimated value of future policyholder benefits and settlement obligations to be paid over the term remaining on

1 This item is a Non-GAAP measure. See "Performance and Non-GAAP Measures" below.

in-force policies, including the costs of servicing the policies, reduced by the future expected policy revenues and future expected investment income on assets supporting the policies. Investment returns are projected using the current asset portfolios and projected reinvestment strategies. Experience gains and losses are reported when current period activity differs from what was assumed in the policy liabilities at the beginning of the period. We classify gains and losses by assumption type. For example, current period investing activities that increase (decrease) the future expected investment income on assets supporting the policies will result in an investment-related experience gain (loss). See description of investment-related experience in "Performance and Non-GAAP Measures" below.

As noted in "Critical Actuarial and Accounting Policies – Future Accounting and Reporting Changes" below, IFRS 17 is expected to replace IFRS 4, and therefore CALM, in 2022 and will materially change the recognition and measurement of insurance contracts and the corresponding presentation and disclosures in the Company's Consolidated Financial Statements and MD&A. While there are many differences, two items of note are:

- 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, as outlined below ("Critical Actuarial and Accounting Policies – Determination of Policy Liabilities – Investment Returns"), we use the returns in the current and projected assets supporting the policy liabilities to value the liabilities. The difference in the discount rate approach also impacts the timing of investment-related experience earnings emergence. As outlined in the "Performance and Non-GAAP measures" section below, under CALM, investment-related experience includes investment experience and the impact of investing activities. 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 balance sheet and amortized into income as the services are provided. Under CALM, new business gains (and losses) are recognized in income immediately. In 2018, we reported $746 million (post-tax) of new business gains in net income attributed to shareholders (2017—$680 million).

Public Equity Risk and Interest Rate Risk

At December 31, 2018, the impact of a 10% decline in equity markets was estimated to be a charge of $680 million and the impact of a 50 basis point decline in interest rates, across all durations and markets, on our earnings was estimated to be a charge of $100 million. See "Risk Management" and "Risk Factors" below.

Impact of Foreign Exchange Rates

We have worldwide operations, including in Canada, the United States and various markets in Asia, and generate revenues and incur expenses in local currencies in these jurisdictions, all of which are translated into Canadian dollars. The bulk of our exposure to foreign exchange rates is to movements in the U.S. dollar.

Items impacting our Consolidated Statements of Income are translated to Canadian dollars using average exchange rates for the respective quarterly period. For items impacting our Consolidated Statements of Financial Position, period end rates are used for currency translation purpose. The following table provides the most relevant foreign exchange rates for 2018 and 2017.

	Quarterly					Full Year	
Exchange rate	**4Q18**	3Q18	2Q18	1Q18	4Q17	**2018**	2017
Average[1]							
U.S. dollar	**1.3204**	1.3070	1.2912	1.2647	1.2712	**1.2958**	1.2980
Japanese yen	**0.0117**	0.0117	0.0118	0.0117	0.0113	**0.0117**	0.0116
Hong Kong dollar	**0.1687**	0.1666	0.1645	0.1616	0.1628	**0.1654**	0.1666
Period end							
U.S. dollar	**1.3642**	1.2945	1.3168	1.2894	1.2545	**1.3642**	1.2545
Japanese yen	**0.0124**	0.0114	0.0119	0.0121	0.0111	**0.0124**	0.0111
Hong Kong dollar	**0.1742**	0.1654	0.1678	0.1643	0.1605	**0.1742**	0.1605

(1) Average rates for the quarter are from Bank of Canada which are applied against Consolidated Statements of Income items for each period. Average rate for the full year is a 4-point average of the quarterly average rates.

Net income attributed to shareholders and core earnings from the Company's foreign operations are translated to Canadian dollars, and in general, our net income attributed to shareholders and core earnings benefit from a weakening Canadian dollar and are adversely affected by a strengthening Canadian dollar. However, in a period of losses, the weakening of the Canadian dollar has the effect of increasing the losses. The relative impact of foreign exchange in any given period is driven by the movement of currency rates as well as the proportion of earnings generated in our foreign operations.

Changes in foreign exchange rates had no material impact on core earnings in 2018 compared with 2017. The impact of foreign currency on items excluded from core earnings does not provide relevant information given the nature of these items.

Strategic Highlights

In 2018, Manulife continued to execute against our five priorities and ambition of becoming the most digital and customer-centric global company in our industry and delivering top quartile shareholder return.

To optimize our portfolio and put our capital to best use we have set a target to release $5 billion of capital related to our North American legacy businesses by 2022. Our North American legacy businesses include the U.S. long-term care business, most variable annuity business, closed blocks of life insurance, and closed blocks of fixed products.

In 2018, we released $3.0 billion of capital and have announced initiatives that when fully executed are expected to release a further $0.7 billion in 2019. Of the $3.0 billion of capital released in 2018, $1.9 billion related to a reduction in the allocation to ALDA in the portfolio asset mix supporting our legacy business, and $1.1 billion was from reinsurance and other actions in our North American legacy businesses ($0.6 billion in the U.S. and $0.5 billion in Canada). The reduction in the allocation to ALDA in our portfolio asset mix was the result of our decision announced in December 2017 to free up approximately $2 billion in capital over 12-18 months in our portfolio. We expect to achieve the full reduction by mid-2019.[1]

To aggressively manage our costs to be competitive and create value we are focused on a wide range of opportunities to simplify and digitize our processes and leverage scale to drive cost savings. In 2018, we announced initiatives that we expect to deliver annual pre-tax run-rate savings of over $300 million, the vast majority of which are to be achieved by the end of 2019. The initiatives included a voluntary exit program as part of our Canadian operations transformation program and a voluntary retirement program for eligible staff in North America. We also commenced the optimization of our real estate foot print in the U.S. and Canada and launched a multi-year IT outsourcing initiative in the U.S. In addition, aligned with improving our employee engagement and customer experience, we commenced a number of initiatives designed to improve processes and customer experience while also reducing costs.

We have set a target to achieve a 50% expense efficiency ratio and approximately $1 billion in expense savings and avoidance by 2022. In 2018, our expense efficiency ratio was 52% and we achieved expense savings and avoidance of $300 million. While we are pleased that we have managed expense growth to less than half of historic levels, it is still early in our expense efficiency journey and the ratio will fluctuate as we invest in our strategic and regulatory initiatives and execute on our expense efficiency actions.

To accelerate growth in our highest potential businesses, (Asia, Global WAM, group insurance in Canada, and behavioural insurance products), we are focused on a number of initiatives to expand our distribution network, products and services. For example, with respect to behavioural insurance, in 2018 we: launched our ManulifeMOVE program in Singapore; increased the number of ManulifeMOVE eligible products and distributors in Hong Kong and mainland China; expanded the Manulife Vitality program to all Individual Family Term products and announced the Group Insurance Manulife Vitality program in Canada; and launched John Hancock Vitality GO on all life insurance policies in the U.S. Other growth initiatives for each segment are outlined in the “Strategic Highlights” section of each segment below.

We have set a target to generate two-thirds of core earnings from high potential businesses by 2022. In 2018, these businesses generated over 55% of our core earnings.

To put customers first we are implementing a number of customer-centric digital processes and systems. Examples in 2018 include simplifying the submission and claims processing for our customers in Asia, being the first Canadian life insurer to underwrite using artificial intelligence, introducing a direct-to-consumer financial advice platform in the U.S., and launching an innovative goals-based investing program in Canada. Customer initiatives for each of our segments are outlined in the “Performance by Segment – Strategic Highlights” sections below.

To measure our progress, we are currently implementing net promoter score (“NPS”) systems in all markets and have set a target to improve our NPS, a standard measure of customer satisfaction, by 30 points by 2022.

To have a high-performing team we are focused on fostering the right culture to continue to attract, retain and develop the best talent in all our geographies and to engage and excite our employees to rally around our customers. In 2018, we launched our new corporate values which define how we operate and how we work together. They inform how we interact with each other and our customers.

We have set a target to achieve top quartile employee engagement compared to global financial services companies by 2022, and in 2018 we were slightly above the median, placing us in the lower part of the 2nd quartile. Our plans to streamline processes and systems noted in the expense and customer priorities above, are underpinned by areas identified by our employees which will also improve engagement.

[1] See “Caution regarding forward-looking statements” above.

Asia

Our Asia segment is a leading provider of insurance products and insurance-based wealth accumulation products, driven by a customer-centric strategy. Present in many of Asia's largest and fastest growing economies, we have operations in the following markets: Japan, Hong Kong, Macau, Singapore, mainland China, Indonesia, Vietnam, the Philippines, Malaysia, Cambodia and Thailand. We are strongly positioned to capitalize on the attractive underlying demographics of the region, underpinned by a rigorous focus on creating value for our customers, employees and shareholders.

We have a diversified multi-channel distribution network, including nearly 80,000 contracted agents and over 100 bank partnerships. We also work with many independent agents, financial advisors and brokers. Among our bancassurance partnerships we have eight exclusive partnerships, including a long-term partnership with DBS across Singapore, Hong Kong, mainland China and Indonesia, that give us access to more than 14 million bank customers.

In 2018, Asia contributed 29% of the Company's core earnings from operating segments and, as at December 31, 2018, accounted for 10% of the Company's assets under management and administration.

Profitability

Asia reported net income attributed to shareholders of $1,687 million in 2018 compared with $1,834 million in 2017. Net income attributed to shareholders is comprised of core earnings, which was $1,749 million in 2018 compared with $1,453 million in 2017, and items excluded from core earnings, which amounted to a net charge of $62 million for 2018 compared with a net gain of $381 million in 2017.

Expressed in U.S. dollars, the presentation currency of the segment, net income attributed to shareholders was US$1,303 million in 2018 compared with US$1,410 million in 2017 and core earnings were US$1,349 million in 2018 compared with US$1,121 million in 2017. Items excluded from core earnings are outlined in the table below and amounted to a net charge of US$46 million in 2018 and a net gain of US$289 million in 2017.

Core earnings in 2018 increased 20% compared with 2017, after adjusting for the impact of changes in foreign currency exchange rates. The increase in core earnings was driven by the favourable impact of new business from higher sales volume and improved product mix, and in-force business growth.

The table below reconciles net income attributed to shareholders to core earnings for Asia for 2018, 2017 and 2016.

For the years ended December 31,	**Canadian $**			**US $**		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
Core earnings[1]	**$ 1,749**	$ 1,453	$ 1,321	**$ 1,349**	$ 1,121	$ 998
Items to reconcile core earnings to net income attributed to shareholders:						
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities[2]	**(375)**	12	(433)	**(287)**	2	(326)
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	**284**	242	91	**219**	186	69
Change in actuarial methods and assumptions	**27**	166	(161)	**21**	132	(122)
Other[3]	**2**	(39)	–	**1**	(31)	–
Net income attributed to shareholders	**$ 1,687**	$ 1,834	$ 818	**$ 1,303**	$ 1,410	$ 619

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

(2) The direct impact of equity markets and interest rates is relative to our policy liability valuation assumptions and includes changes to interest rate assumptions. The net charge of $375 million in 2018 (2017 – net gain of $12 million) consisted of a $23 million charge (2017 – $47 million gain) related to variable annuities that are not dynamically hedged, a charge of $317 million (2017 – $130 million gain) on general fund equity investments supporting policy liabilities, a $27 million charge (2017 – $151 million charge) related to fixed income reinvestment rates assumed in the valuation of policy liabilities and a $8 million charge (2017 – $12 million charge) related to variable annuity guarantee liabilities that are dynamically hedged. The amount of variable annuity guaranteed value that was dynamically hedged at the end of 2018 was 99% (2017 – 92%). Our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products.

(3) Other items in 2017 included restructuring costs in Thailand.

Growth *(all percentages quoted are on a constant exchange rate basis)*

Annualized premium equivalent ("APE") sales in 2018 were US$3,094 million, 6% higher than 2017 as sales growth in Hong Kong and Asia Other was partially offset by lower sales in Japan. In Japan, APE sales in 2018 were US$1,087 million, a decrease of 3% compared with 2017. While we experienced a sales decline in the first half of 2018 as a result of strong competition in the Corporate-owned life insurance ("COLI") term product segment, this was largely offset by the successful launch of a new COLI term product in the second half of the year, which drove sales growth of 26% compared with the second half of 2017. Hong Kong APE

sales in 2018 were US$647 million, an increase of 11% compared with 2017, driven by growth in both our agency and bancassurance channels. Asia Other APE sales in 2018 were US$1,360 million, an increase of 13% compared with 2017. Higher sales in protection products were partially offset by lower sales in single premium investment-linked products, reflecting market volatility in 2018.

New business value ("NBV") was US$1,112 million in 2018, exceeding US$1 billion for the first time and representing an increase of 19% compared with 2017. We experienced growth across all of our businesses in Asia. In Japan, NBV in 2018 was US$329 million, an increase of 8% compared with 2017 due to higher margins from improved product mix and management actions. In Hong Kong, NBV in 2018 was US$418 million, an increase of 21% compared with 2017 resulting from higher sales and continued success of our critical illness products. Asia Other NBV in 2018 was US$365 million, an increase of 30% compared to 2017. The NBV margin was 38.0% in 2018, an increase of 3.9 percentage points compared to 2017.

APE Sales and NBV

For the years ended December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
Annualized premium equivalent sales	**$ 4,012**	$ 3,747	$ 3,307	**$ 3,094**	$ 2,887	$ 2,498
New business value	**1,443**	1,201	998	**1,112**	926	754

Assets under Management

Asia's assets under management were US$78.2 billion as at December 31, 2018, an increase of US$5.1 billion or 8% compared with December 31, 2017, driven by net customer inflows of US$10 billion partially offset by the impact of the challenging macro-economic conditions in the fourth quarter of 2018.

Assets under Management

As at December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
General fund	**$ 87,323**	$ 72,777	$ 62,343	**$ 64,010**	$ 58,009	$ 46,423
Segregated funds	**19,333**	18,917	18,348	**14,176**	15,074	13,659
Total assets under management	**$ 106,656**	$ 91,694	$ 80,691	**$ 78,186**	$ 73,083	$ 60,082

Revenue

Total revenue in 2018 of US$15.2 billion decreased US$0.8 billion compared with 2017, of which US$3.2 billion related to a net decrease in realized and unrealized investment gains and losses, primarily due to market conditions, including a decline in equity markets in 2018. Revenue before net realized and unrealized investment gains and losses increased US$2.4 billion compared with 2017 and included an increase in net premium income of US$1.9 billion. This increase was primarily driven by the growth of new and in-force business, partly offset by a decline in single premium sales in Japan.

Revenue

For the years ended December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
Gross premiums	**$ 18,768**	$ 16,215	$16,012	**$ 14,483**	$ 12,500	$ 12,084
Premiums ceded to reinsurers	**(656)**	(503)	(428)	**(507)**	(384)	(327)
Net premium income	**18,112**	15,712	15,584	**13,976**	12,116	11,757
Investment income	**2,333**	2,000	1,825	**1,799**	1,543	1,378
Other revenue	**1,296**	934	1,029	**1,000**	719	780
Revenue before net realized and unrealized investment gains and losses	**21,741**	18,646	18,438	**16,775**	14,378	13,915
Net realized and unrealized investment gains and losses	**(2,054)**	2,044	299	**(1,599)**	1,563	212
Total revenue	**$ 19,687**	$ 20,690	$18,737	**$ 15,176**	$ 15,941	$ 14,127

Strategic Highlights

Asia continues to be a core driver of growth for Manulife, supported by a clear strategy, a focus on execution, a strong team, and a diversified footprint in 12 markets with a compelling economic backdrop. We operate in many of the fastest growing markets in the world, and middle-class emergence, combined with an estimated doubling of household wealth in Asia from 2015 to 2025[1], will continue to drive demand for financial solutions.

In 2018, we continued to accelerate our growth by expanding our distribution reach and we implemented a number of changes to enhance customer experience.

Our expansion actions included:

- Increasing the number of agents by 13% to nearly 80,000. Our number of Million Dollar Round Table agents has increased to 3,000, up by 41% over 2017.
- Continuing our momentum in bancassurance. We now have eight exclusive bancassurance partnerships, including a major pan-Asia partnership with DBS, giving us access to more than 14 million bank customers. Our most recent is a 15-year exclusive bancassurance partnership with Sathapana Bank in Cambodia; and
- Adding a number of managed general agencies in Japan to our existing network.

In 2018, we rolled out a number of key initiatives, advancing our digital strategy. These included:

- Introducing facial recognition that allows real-time verification for our agents and policyholders in mainland China;
- Launching eClaims in Hong Kong, Japan and Vietnam to simplify the submission and claim processes for our customers and improving efficiency;
- Enhancing our award-winning[2] electronic point-of-sale systems in Japan with more product offerings and customer-focused functionality;
- Launching our ManulifeMOVE behavioural insurance program in Singapore. In addition, in Hong Kong and mainland China, we increased the number of ManulifeMOVE eligible products and the number of retail partners. As a result, ManulifeMOVE enrolment doubled in 2018;
- Sponsoring a number of health and wellness events across Asia to promote the benefits of our behavioural insurance offerings. Our customers are our priority and we have seen our NPS improve to +5.4 in Asia. Furthermore, we added more than 1 million new customers bringing our total to over 10 million customers; and
- Signing a strategic partnership in mainland China with leading healthcare platform 111, Inc., to explore opportunities for innovative products and services using the combined capabilities of both partners.

Our Asia business remains focused on expanding our distribution, digitizing our existing channels and processes, and building our digital capabilities. To accelerate our execution in 2018, we attracted top talent and have recruited various executives for the Asia segment.

1 Source: Asia household wealth in 2015 – Economic Intelligence Unit; and in 2025 – Manulife & Oliver Wyman estimates
2 Received University & College Designers Association ("UCDA") award (2018)

Canada

Our Canada segment is a leading financial services provider, offering insurance products, insurance-based wealth accumulation products and banking services, and leveraging the asset management expertise and products managed by our Global Wealth and Asset Management segment. The comprehensive solutions we offer target a broad range of customer needs and foster holistic long-lasting relationships.

We offer financial protection solutions to middle- and upper-income individuals, families and business owners through a combination of competitive products, professional advice and quality customer service. We provide group life, health and disability insurance solutions to Canadian employers, with more than 22,000 Canadian businesses and organizations entrusting their employee benefit programs to Manulife's Group Insurance. We also provide life, health and specialty products, such as travel insurance, through advisors, sponsor groups and associations, as well as direct-to-customer. We continue to increase the proportion of products with behavioural insurance features.

Manulife Bank offers flexible debt and cash flow management solutions as part of a customer's overall financial plan. Products include savings and chequing accounts, GICs, lines of credit, investment loans, mortgages and other specialized lending programs, offered through financial advisors supported by a broad distribution network.

In 2018, Canada contributed 23% of the Company's core earnings from operating segments and, as at December 31, 2018, accounted for 13% of the Company's assets under management and administration.

Profitability

Canada's full year 2018 net income attributed to shareholders was $1,011 million compared with $554 million in 2017. Net income attributed to shareholders is comprised of core earnings, which was $1,356 million in 2018 compared with $1,209 million in 2017, and items excluded from core earnings amounted to a net charge of $345 million for 2018 compared with a net charge of $655 million in 2017. Items excluded from core earnings are outlined in the table below.

The $147 million or 12% increase in core earnings was driven by favourable policyholder experience in our group insurance business, compared with unfavourable policyholder experience in 2017, and the impact of new business in individual insurance from both the sales of the Manulife Par product launched in the second half of 2018 and price increases put in place in late 2017. These increases were partially offset by lower gains related to the release of provisions for uncertain tax positions of prior years.

The table below reconciles net income attributed to shareholders to core earnings for Canada for 2018, 2017 and 2016.

For the years ended December 31, ($ millions)	2018	2017	2016
Core earnings[1]	**$ 1,356**	$ 1,209	$ 1,191
Items to reconcile core earnings to net income attributed to shareholders:			
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	**240**	(99)	(112)
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities[2]	**(307)**	(227)	270
Change in actuarial methods and assumptions	**(370)**	36	31
Charge related to decision to change portfolio asset mix supporting our legacy businesses	**–**	(343)	–
Impact related to U.S. Tax Reform	**(2)**	–	–
Reinsurance transactions and other[3]	**94**	(22)	(31)
Net income attributed to shareholders	**$ 1,011**	$ 554	$ 1,349

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

(2) The direct impact of equity markets and interest rates is relative to our policy liability valuation assumptions and includes changes to interest rate assumptions. The charge of $307 million in 2018 (2017 – $227 million charge) consisted of a $109 million charge (2017 – $35 million gain) on general fund equity investments supporting policy liabilities, a $94 million charge (2017 – $210 million charge) related to fixed income reinvestment rates assumed in the valuation of policy liabilities, nil (2017 – $1 million gain) related to unhedged variable annuities and a $104 million charge (2017 – $53 million charge) related to variable annuity guarantee liabilities that are dynamically hedged. The percentage of variable annuity guaranteed value that was dynamically hedged at the end of 2018 was 76% (2017 – 81%). The decrease in percentage dynamically hedged is a result of the increase in lower risk segregated fund products. Our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products.

(3) The 2018 gain of $94 million was driven by gains from reinsurance transactions. The 2017 and 2016 charges of $22 million and $31 million, respectively, included integration and acquisition items.

Growth

APE sales were $975 million in 2018, a decrease of $391 million or 29% compared with 2017 due to the non-recurrence of a large-case group insurance sale in the prior year. For this reason, group insurance APE sales in 2018 of $456 million decreased $359 million or 44% compared with 2017. Individual insurance APE sales in 2018 of $289 million were in line with 2017, as sales from the Manulife Par product launched in 2018, were offset mainly by lower sales due to the price increases in late 2017. Annuities APE sales in 2018 of $230 million decreased $30 million or 12% compared with 2017 due to actions to de-emphasize higher risk segregated fund sales. We are focused on growth in lower risk segregated fund products, which in 2018 grew by 6% and accounted for 75% of Annuity APE sales.

Sales

For the years ended December 31, ($ millions)	2018	2017	2016
Annualized premium equivalent ("APE") sales	**$ 975**	$ 1,366	$ 978

Manulife Bank average net lending assets were $21.0 billion in 2018, up $1.1 billion or 5% from 2017.

Assets under Management

Assets under management of $142.9 billion as at December 31, 2018 decreased by $1.7 billion or 1% from $144.6 billion at December 31, 2017.

Assets under Management

As at December 31, ($ millions)	2018	2017	2016
General fund	**$ 109,614**	$ 108,160	$ 106,235
Segregated funds	**33,306**	36,460	36,153
Total assets under management	**$ 142,920**	$ 144,620	$ 142,388

Revenue of $13.6 billion in 2018 increased $2.4 billion from $11.2 billion in 2017. Revenue before net realized and unrealized investment gains and losses of $15.0 billion in 2018 increased $4.4 billion from $10.6 billion in 2017, driven by a change made to a reinsurance agreement in 2018 (impact was to premiums ceded of $3.8 billion and to other revenue of $0.4 billion).

Revenue

As at December 31, ($ millions)	2018	2017	2016
Gross premiums	**$ 10,974**	$ 10,124	$ 10,708
Premiums ceded to reinsurers	**(1,547)**	(5,359)	(5,736)
Net premium income	**9,427**	4,765	4,972
Investment income	**4,158**	3,958	3,936
Other revenue	**1,446**	1,862	2,111
Revenue before net realized and unrealized investment gains and losses	**15,031**	10,585	11,019
Net realized and unrealized investment gains and losses(1)	**(1,394)**	602	316
Total revenue	**$ 13,637**	$ 11,187	$ 11,335

(1)See "Financial Performance – Impact of Fair Value Accounting" above.

Strategic Highlights

In 2018, we continued to revitalize and modernize our business by further expanding our product shelf and continuing to build a customer-centric digital platform. We executed a number of significant actions on our legacy business and successfully executed on our expense reduction strategy to strengthen financial results and improve the risk-return profile in our home market. Our Canada segment remains focused on building and fostering holistic long-lasting relationships by expanding and integrating our insurance, insurance-based wealth accumulation and banking solutions to meet customers' needs and by leveraging the strength of our group franchise.

We are revitalizing our business by expanding our product shelf and modernizing our delivery process. In 2018, we:

- Launched Manulife Par, our new participating whole life insurance product, to provide greater choice for our customers and as an opportunity for Manulife to build market share in the whole life market which accounts for over half of the Canadian industry's individual life insurance new business;[1]
- Expanded the Vitality program to all Individual Insurance Family Term products, becoming the market leader in behavioural insurance with approximately 32% of eligible customers choosing the Manulife Vitality feature;
- Announced the Group Insurance Manulife Vitality program. Available in the spring of 2019, the focus of this program is to encourage participants to make healthy choices and employers to drive higher engagement and productivity; and
- Launched a new website and expanded digital solutions for Manulife Bank making it easier for our customers to do business with us.

We have made a number of enhancements to our customer-focused platforms across our product lines. In 2018, we:

- Introduced artificial intelligence underwriting to the Canadian life insurance market, which improves efficiency and shortens our response time to customers;

1 Source: Third quarter 2018 LIMRA market data.

- Partnered with Canada's largest pharmacy chain, Shoppers Drug Mart, to launch the first medical marijuana program in Canada to help customers receive the right strain and formulation for their condition;
- Achieved two million robotics-processed transactions, which improves efficiency and makes it easier for our customers to do business with us through faster processing times and improved transaction quality;
- Increased our paperless claims process to over 80% of all Group Insurance claims; and
- Launched our new Life Moments strategy, focusing on personalizing customer experience for key life moments, when our customers need us most.

We are also focused on optimizing capital in our legacy businesses and in 2018 we released approximately $500 million of capital. In 2018, we entered into four reinsurance transactions to reduce risk and free up a total of $400 million of capital. These transactions included reinsuring the mortality and lapse risk on a portion of our Canadian legacy universal life policies as well as longevity risk on our Canadian group annuity policies. In addition, we offered some of our customers in our legacy segregated fund products an opportunity to convert their policy to a lower risk segregated fund product which released over $100 million of capital.

With respect to managing expenses, we began execution on our initiatives to digitize and consolidate a number of back-office functions, resulting in a workforce reduction through a voluntary exit program and natural attrition. We also offered a voluntary retirement plan and announced and commenced our plans to consolidate our real estate footprint. The real estate consolidation and office space reconfiguration will also create a more collaborative work environment.

U.S.

Our U.S. segment provides a broad portfolio of life insurance products, insurance-based wealth accumulation products, digital advice solutions, and administers our in-force long-term care insurance and our annuity businesses.

The insurance products we offer are designed to provide estate, business and income-protection solutions for high net worth, emerging affluent markets and the middle market, and to leverage the asset management expertise and products managed by our Global Wealth and Asset Management business. The primary distribution channel is licenced financial advisors, with some direct-to-consumer insurance business. Behavioural insurance features are standard on all our new insurance product offerings.

Long-term care insurance provides coverage for the cost of long-term services and support. We ceased selling stand-alone long-term care products but continue to offer long-term care coverage as an accelerated benefit rider to our wide range of life insurance products.

Our in-force annuity business includes fixed deferred, variable deferred, and payout products.

Through our digital-advice capabilities and platform, we hope to establish lifelong customer relationships that benefit from our holistic protection and wealth product offerings in the future.

In 2018, U.S. contributed 31% of the Company's core earnings from operating segments and, as at December 31, 2018, accounted for 21% of the Company's assets under management and administration.

Profitability

U.S. reported net income attributed to shareholders of $2,332 million in 2018 compared with a net loss attributed to shareholders of $1,201 million in 2017. Net income attributed to shareholders is comprised of core earnings, which was $1,830 million in 2018 compared with $1,609 million in 2017, and items excluded from core earnings, which amounted to a net gain of $502 million in 2018 compared with a net charge of $2,810 million in 2017.

Expressed in U.S. dollars, the functional currency of the segment, 2018 net income attributed to shareholders was US$1,800 million compared with a net loss attributed to shareholders of US$992 million in 2017 and core earnings were US$1,412 million in 2018 compared with US$1,241 million in 2017. Items excluded from core earnings are outlined in the table below and amounted to a net gain of US$388 million in 2018 compared with a net charge of US$2,233 million in 2017.

The US$171 million increase in core earnings was driven by the favourable impact of lower U.S. tax rates and favourable policyholder experience compared with unfavourable policyholder experience in 2017 (long-term care policyholder experience was neutral in 2018).

The table below reconciles net income attributed to shareholders to core earnings for the U.S. for 2018, 2017 and 2016.

For the years ended December 31, ($ millions)	Canadian $			US $		
	2018	2017	2016	**2018**	2017	2016
Core earnings[1]	**$ 1,830**	$ 1,609	$ 1,317	**$ 1,412**	$ 1,241	$ 993
Items to reconcile core earnings to net income attributed to shareholders:						
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	**17**	343	149	**10**	263	122
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities[2]	**236**	505	(515)	**191**	384	(387)
Change in actuarial methods and assumptions	**286**	(245)	(325)	**219**	(195)	(250)
Impact related to U.S. Tax Reform	**(7)**	(2,822)	–	**(5)**	(2,220)	–
Charge related to decision to change portfolio asset mix supporting our legacy businesses	**–**	(689)	–	**–**	(542)	–
Intangible write-off (Long Term Care)[3]	**–**	–	(97)	**–**	–	(74)
Other[4]	**(30)**	98	(11)	**(27)**	77	(8)
Net income (loss) attributed to shareholders	**$ 2,332**	$ (1,201)	$ 518	**$ 1,800**	$ (992)	$ 396

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

(2) The direct impact of equity markets and interest rates is relative to our policy liability valuation assumptions and includes changes to interest rate assumptions. Our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products. The US$191 million gain in 2018 (2017 – US$384 million gain) consisted of a US$184 million charge (2017 – US$114 million gain) related to variable annuities that are dynamically hedged, a US$22 million charge (2017 – US$46 million gain) on general fund equity investments supporting policy liabilities, a US$50 million charge (2017 – US$123 million gain) related to variable annuities that are not dynamically hedged, and a US$446 million gain (2017 – US$102 million gain) related to fixed income reinvestment rates assumed in the valuation of policy liabilities. The amount of variable annuity guaranteed value that was dynamically hedged or reinsured at the end of 2018 was 93% (2017 – 94%).

(3) The 2016 charge of US$74 million relates primarily to the intangible asset distribution network write-off in the John Hancock Long Term Care business.

(4) The 2018 charge of US$27 million included a provision for a legal settlement of US$72 million, partially offset by a gain of US$51 million from external reinsurance transactions. The 2017 gain of US$77 million included a gain resulting from an internal legal entity restructuring partially offset by a provision for a legal settlement.

Growth

U.S. APE sales in 2018 of US$426 million declined 8% compared with 2017, driven by increased competition in the international high net worth segment and actions to maintain margins. Sales of products with the Vitality Plus feature in 2018 were US$101 million, an increase of 52% compared with 2017.

Sales[1]

For the years ended December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
APE sales[1]	**$ 553**	$ 603	$ 552	**$ 426**	$ 464	$ 417

(1) Does not include sales of long-term care products of US$42 million in 2016.

Assets under Management

U.S. assets under management of US$165.1 billion as at December 31, 2018 declined by 9% from December 31, 2017. The decrease was driven by the impact of the reinsurance transactions noted above, the continued run-off of our annuities business and the impact of market movements on the fair value of assets held in our general and segregated funds.

Assets under Management

As at December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
General fund	**$ 152,398**	$ 150,837	$ 151,968	**$ 111,713**	$ 120,237	$ 113,186
Segregated funds	**72,875**	77,998	79,670	**53,420**	62,174	59,339
Total assets under management	**$ 225,273**	$ 228,835	$ 231,638	**$ 165,133**	$ 182,411	$ 172,525

Revenue

Total revenue in 2018 of US$531 million decreased US$15.9 billion compared with 2017. Revenue before net realized and unrealized investment gains and losses was US$5.0 billion, a decrease of US$9.0 billion compared with 2017 primarily due the impact on ceded premiums of US$8.1 billion and other revenue of US$0.4 billion from the 2018 reinsurance transactions related to our legacy business.

Revenue

For the years ended December 31,	Canadian $			US $		
($ millions)	**2018**	2017	2016	**2018**	2017	2016
Gross premium income	**$ 9,335**	$ 9,939	$ 9,863	**$ 7,201**	$ 7,667	$ 7,443
Premiums ceded to reinsurers	**(12,961)**	(2,317)	(2,876)	**(9,878)**	(1,786)	(2,157)
Net premium income	**(3,626)**	7,622	6,987	**(2,677)**	5,881	5,286
Investment income	**7,344**	7,382	6,972	**5,665**	5,689	5,265
Other revenue	**2,542**	3,040	3,025	**1,966**	2,341	2,286
Revenue before items noted below	**6,260**	18,044	16,984	**4,954**	13,911	12,837
Net realized and unrealized investment gains and losses[1]	**(5,621)**	3,274	1,033	**(4,423)**	2,495	790
Total revenue	**$ 639**	$ 21,318	$ 18,017	**$ 531**	$ 16,406	$ 13,627

(1) See "Financial Performance – Impact of Fair Value Accounting" above.

Strategic Highlights

At John Hancock, we are focused on building more holistic and long-lasting customer relationships by offering innovative products and solutions and making it easier for customers to do business with us. We are focused on revitalizing our insurance business by expanding our product shelf, modernizing the delivery process, and enhancing customer experience.

In 2018, we:

- Became the first U.S. life insurance company to fully embrace behavioural-based life insurance with the October 1st launch of John Hancock Vitality Go on all life insurance policies at no additional cost. This basic, "be healthy" version of the program provides access to expert fitness and nutritional resources, and personalized health goals that when achieved unlock rewards and discounts at major brand outlets;
- Enhanced our behavioural insurance offering by launching the HealthyMind initiative, a component of our John Hancock Vitality offering, which rewards customers for meditation and sleep activities; and
- Introduced Twine, the first mass-market offering from John Hancock Digital Advice, a nascentdirect-to-consumer financial advice platform that has attracted interest in the competitive robo-advisory market; it was the first financial robo-advisor app to be featured as Apple's iPhone App of the Day.

We continued to actively manage our legacy businesses and maintain sharp focus on expenses across all business lines. In 2018, we:

- Reinsured substantially all of our legacy individual and group payout annuity businesses (the portions of these transactions related to New York business will close separately in 2019, subject to regulatory approval) and sold Signator Investors, our wholly-owned broker-dealer. These transactions released approximately $600 million of capital in 2018 and are expected to release a further $600 million in 2019[1];
- Stopped selling Corporate and Bank-owned life insurance products, alow-return offering in our U.S. product portfolio;
- Continued to make progress on our long-term care rerate approvals: additionally, our customer-centric approach includes choices available to policyholders to manage their costs through benefit elections;
- Ceased selling annuity and stand-alone long-term care products but continued to offer long-term care coverage as an accelerated benefit rider on our wide range of life insurance products; and
- Entered into a multi-year IT outsourcing initiative, offered a voluntary retirement plan and consolidated our real estate footprint for our U.S. regional head office. The real estate consolidation and office space reconfiguration also created a more collaborative work environment.

1 See “Caution regarding forward-looking statements” above.

Global Wealth and Asset Management

Our Global Wealth and Asset Management segment serves individual investors and institutional clients in three business lines: Retirement, Retail and Institutional Asset Management. We have operations in 16 markets, and leverage our Asia, Canada and U.S. segments.

Retirement provides financial advice, investment products and electronic record-keeping services to over seven million individual participants in North America and Asia. In North America, our Canadian Group Retirement business focuses on providing retirement solutions through defined contribution and defined benefit plans; and in the United States, John Hancock Retirement Plan Services provides employer sponsored retirement plans and also services personal retirement accounts for former client employees. In Asia, we provide retirement offerings to employers and individuals, including Mandatory Provident Fund ("MPF") schemes and administration in Hong Kong.

Retail distributes investment funds through intermediaries in North America, Europe and Asia, and operates a manager-of-manager model, which identifies and sources investment strategies across the world, both proprietary and external. In Canada, we also provide personalized investment management, private banking and estate solutions to affluent clients.

Institutional Asset Management provides investment management solutions to over 700 institutional clients (such as pension plans, foundations, endowments and financial institutions) globally across major asset classes including equities, fixed income, and alternative assets (including real estate, timberland, farmland, private equity/debt, infrastructure, and liquid alternatives). In addition, we also offer multi-asset investment management solutions for a broad range of clients' investment needs.

In 2018, Global WAM contributed 17% of the Company's core earnings from operating segments and, as at December 31, 2018, accounted for 56% of the Company's assets under management and administration.

Profitability

Global WAM's 2018 net income attributed to shareholders was $955 million compared with $1,078 million in 2017, core earnings were $986 million in 2018 compared with $816 million in 2017. Items excluded from core earnings are outlined in the table below and amounted to a net charge of $31 million in 2018 compared with a net gain of $262 million in 2017.

The $171 million increase in core earnings was driven by higher fee income from higher average asset levels, lower amortization of deferred acquisition costs and other depreciation and the impact of lower U.S. tax rates.

The table below reconciles net income attributed to shareholders to core earnings for the Global WAM segment for 2018, 2017 and 2016.

For the years ended December 31, ($ millions)	2018	2017	2016
Core earnings[1]			
Asia	**$ 257**	$ 210	$ 171
Canada	**267**	253	190
U.S.	**462**	353	301
Core earnings	**986**	816	662
Items to reconcile core earnings to net income attributed to shareholders:			
Impact related to U.S. Tax Reform	**(2)**	308	–
Other[2]	**(29)**	(46)	(47)
Net Income attributed to shareholders	**$ 955**	$ 1,078	$ 615

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

In 2018, core EBITDA for Global WAM was $1,498 million, higher than core earnings by $512 million. In 2017, core EBITDA was $1,426 million, higher than core earnings by $610 million. The increase of $72 million in core EBITDA was driven by higher fee income from higher average asset levels.

Core EBITDA[1]

For the years ended December 31, ($ millions)	2018	2017	2016
Core earnings	**$ 986**	$ 816	$ 662
Amortization of deferred acquisition costs and other depreciation	**301**	344	338
Amortization of deferred sales commissions	**98**	99	104
Core income tax expense (recovery)	**113**	167	105
Core EBITDA	**$ 1,498**	$ 1,426	$ 1,209

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
(2) The 2018 charge of $29 million relates to the integration of businesses acquired from Standard Chartered, as does the 2017 charge of $46 million.

Growth

Gross Flows and Net Flows

In 2018, gross flows of $119.0 billion were $3.0 billion or 2% lower than 2017, driven by a slowdown in U.S. retail gross flows amid equity market declines and lower gross flows in mainland China from retail money market funds. This was partially offset by growth of $5.4 billion in institutional asset management driven by the launch of the John Hancock Infrastructure Fund globally and a real estate separately managed account, and the funding of two large fixed income mandates. WAM net flows of $1.6 billion were $16.7 billion lower than in 2017, driven by higher redemptions in U.S retail amid equity market declines and lower gross flows as mentioned above. 2018 marked the 9th consecutive year of positive net flows in our WAM business.

Asia WAM:

- **Gross flows** in Asia in 2018 were $23.7 billion, a decrease of 15% compared with 2017, the decline was primarily driven by lower gross flows in mainland China from retail money market funds partially offset by higher institutional asset management gross flows. Retirement gross flows were in line with the prior year.
- **Net flows** in 2018 were $5.7 billion in 2018 compared with net flows of $6.6 billion in 2017, driven by lower gross flows in mainland China from retail money market funds.

Canada WAM:

- **Gross flows** in Canada in 2018 were $23.1 billion, an increase of 10% compared with 2017, reflecting growth across all business lines. This was driven by higher new plan deposits and recurring contributions in retirement, strong sales in several balanced and equity products in retail, and the funding of a $0.6 billion custom liability-driven investment mandate and private market product launches in institutional asset management.
- **Net flows** in 2018 were $2.0 billion compared with net flows of $3.7 billion in 2017, the decline was primarily driven by higher retail redemptions across all asset classes amid equity market declines.

U.S. WAM:

- **Gross flows** in the U.S. in 2018 were $72.2 billion, in line with 2017, as we launched the John Hancock Infrastructure Fund, which generated $1.2 billion in gross flows, as well as a $1.2 billion real estate separately managed account, and funded two large fixed income mandates totaling $1.1 billion in institutional asset management. This was offset by lower retail gross flows amid equity market declines. Retirement gross flows were slightly higher than the prior year.
- **Net flows** in 2018 were negative $6.1 billion, compared with positive net flows of $7.9 billion in 2017, the decline was primarily driven by higher retail redemptions amid the declines in equity markets and the redemption of three large-case retirement plans.

Gross Flows and Net Flows

For the years ended December 31, ($ millions)	2018	2017	2016
Gross flows	**$ 119,002**	$ 121,969	$ 118,185
Net flows	**1,563**	18,280	16,482

Assets under Management and Administration

In 2018, AUMA for our wealth and asset management businesses of $609 billion, while in line with the prior year, was 6% lower on a constant exchange rate basis. AUMA increased $1.6 billion from positive net flows and $1.3 billion from assets acquired. This increase was offset by a net $3 billion reduction related to market value movement and the weakening of the Canadian dollar.

Assets under Management and Administration

For the years ended December 31, ($ billions)	2018	2017	2016
Balance January 1,	**$ 609**	$ 554	$ 510
Acquisitions	**1**	–	2
Net flows	**2**	18	17
Impact of markets and other	**(3)**	37	25
Balance December 31,	**$ 609**	$ 609	$ 554

Revenue

Total revenue in 2018 of $5.5 billion increased 5% compared with 2017, driven by higher average asset levels.

Revenue

As at December 31, ($ millions)	2018	2017	2016
Fee income	**$ 5,472**	$ 5,158	$ 4,922
Investment income	**(8)**	42	6
Total revenue	**$ 5,464**	$ 5,200	$ 4,928

Strategic Highlights

We have a clear strategy to pursue attractive, high-growth opportunities through our three business lines: Retirement, Retail and Institutional Asset Management across each of our regions globally. Our strategy involves becoming a global retirement leader supporting financial wellness; expanding our presence in regional retail mutual fund distribution across the globe, leveraging a manager-of-managers model; and providing active asset management capabilities, including high-performing equity and fixed income strategies, outcome-oriented solutions and alternative assets.

In 2018, we executed on a number of initiatives to accelerate growth in our franchise, including:

- Launching the John Hancock Infrastructure Fund with approximately $2.7 billion in capital commitments, which provides third-party investors the opportunity to invest alongside Manulife's General Account in direct private equity investments and co-investments in the infrastructure sector in the U.S;
- Raising almost $1 billion for the Hancock Natural Resources Group's first commingled vehicle devoted to both timberland and farmland;
- Entering into an Outsourced Chief Investment Officer (OCIO) relationship with a distribution partner to provide discretionary asset allocation models, thereby expanding our asset allocation and manager research capabilities;
- Capturing nearly 40% of total defined contribution sales in the Canadian retirement market[1] in the twelve months ended September 30, 2018;
- Securing the initial investment to establish our first Qualified Domestic Limited Partnership fund in December 2018 through our Wholly Foreign-Owned Enterprise license in mainland China; and
- Successfully completing the first retirement-focused target risk fund launch with Agricultural Bank of China.

In 2018, we made progress on our commitment to becoming a customer-centric organization by:

- Strengthening the operating model and leadership team for our global wealth and asset management business to leverage our global scale and capabilities to deliver value to our clients in each market that we serve;
- Launching the innovative goals-based investing program, leveraging industry-leading technology and dynamic liability-driven investment strategies, an industry first for retail customers in Canada;
- Centralizing and modernizing our operations, technology and data platforms through the Global Optimization program, utilizing state of the art technology to deliver a robust digital experience for our stakeholders;
- Continuing to build the next generation of digital advice capabilities in our Retirement business, thereby enhancing the development of our managed account platform and providing on-going advice tools for participants to better prepare for retirement; and
- Launching My Money Connector in the U.S., an aggregation tool that helps participants manage their finances.

1 Source: According to LIMRA, based on a rolling 12-month average.

Corporate and Other

Corporate and Other is comprised of investment performance on assets backing capital, net of amounts allocated to the operating segments; financing costs; costs incurred by the corporate office related to shareholder activities (not allocated to the operating segments); our P&C Reinsurance business; as well as our run-off reinsurance operation, including variable annuities and accident and health.

For segment reporting purposes, settlement costs for macro equity hedges and othernon-operating items are included in Corporate and Other earnings. This segment is also where we reclassify favourable investment-related experience to core earnings from items excluded from core earnings, subject to certain limits (see "Performance and Non-GAAP Measures" below). In each of the operating segments, we report all investment-related experience in items excluded from core earnings.

Profitability

Corporate and Other reported a net loss attributed to shareholders of $1,185 million in 2018 compared with a net loss attributed to shareholders of $161 million in 2017. The net loss attributed to shareholders was comprised of core loss and items excluded from core loss. The core loss was $311 million in 2018 compared with a core loss of $522 million in 2017. Items excluded from core loss amounted to a net charge of $874 million in 2018 compared with a net gain of $361 million in 2017.

The $211 million lower core loss was primarily related to thenon-recurrence of charges to establish $240 million of claims provisions in our P&C business in 2017. In 2018, we had a net $23 million release of P&C provisions (we released a portion of the 2017 provision partially offset by provisions related to a combination of California wild fires, Pacific typhoons and Atlantic hurricanes). The remaining $52 million unfavourable variance was due to the impact of markets, in 2018, on seed money investments in new segregated and mutual funds, the effect of lower U.S. tax rate on the losses in the segment and higher withholding taxes on future U.S. remittances, partially offset by higher investment-related income and lower expected macro hedging costs.

The items excluded from core earnings are outlined below.

The table below reconciles the net loss attributed to shareholders to the core loss for Corporate and Other for 2018, 2017 and 2016.

For the years ended December 31, ($ millions)	**2018**	2017	2016
Core loss excluding core investment gains	**$ (711)**	$ (922)	$ (667)
Core investment gains	**400**	400	197
Total core loss[1]	**(311)**	(522)	(470)
Items to reconcile core loss to net loss attributed to shareholders:			
Direct impact of equity markets and interest rates[2]	**(411)**	(83)	194
Changes in actuarial methods and assumptions	**6**	8	1
Investment-related experience related to mark-to-market items[3]	**59**	81	71
Reclassification to core investment gains above	**(400)**	(400)	(197)
Impact related to U.S. Tax Reform	**135**	737	–
Restructuring charge[4]	**(263)**	–	–
Other	**–**	18	30
Net loss attributed to shareholders	**$ (1,185)**	$ (161)	$ (371)

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
(2) The direct impact of equity markets and interest rates included a gain of $24 million (2017 – loss of $61 million) on derivatives associated with our macro equity hedges and a loss of $284 million (2017 – loss of $41 million) on the sale of AFS bonds. Other items in this category netted to a loss of $151 million (2017 – gain of $19 million).
(3) Investment-related experience includes mark-to-market gains or losses on assets held in the Corporate and Other segment other than gains on AFS equities and seed money investments in new segregated or mutual funds.
(4) Please see "Manulife Financial Corporation – Profitability" above for explanation of the restructuring charge.

Revenue

Revenue in 2018 was a net loss of $455 million and includes a consolidation adjustment of $375 million related to asset management fees earned by MAM from affiliated businesses (the offset to this consolidation adjustment is in investment expenses). Total revenue in 2018 decreased by $383 million compared with 2017, primarily driven by higher net realized losses on AFS securities compared with gains in prior year. These decreases were partially offset by gains in the macro hedge program compared to losses in 2017.

Revenue

For the years ended December 31, ($ millions)	**2018**	2017	2016
Net premium income	**$ 98**	$ 110	$ 87
Investment income (loss)[1]	**(281)**	285	645
Other revenue	**(328)**	(247)	95
Revenue before net realized and unrealized investment gains and losses and on the macro hedge program	**(511)**	148	827
Net realized and unrealized investment gains and losses[2] and on the macro hedge program	**56**	(220)	(507)
Total revenue	**$ (455)**	$ (72)	$ 320

(1) Includes losses of $355 million (2017 – losses of $54 million) on the sale of AFS bonds.
(2) See "Manulife Financial Corporation – Impact of Fair Value Accounting" above.

Strategic Highlights

Our P&C Reinsurance business provides substantial retrocessional capacity for a very select clientele in the property and casualty reinsurance market. The business is largely non-correlated to Manulife's other businesses and helps diversify our overall business mix. We manage the risk exposures of this business in relation to the total Company balance sheet risk and volatility as well as the prevailing market pricing conditions. The business is renewable annually, and we currently estimate our exposure limit in 2019 for a single event to be approximately US$250 million (net of reinstatement premiums) and for multiple events to be approximately US$425 million (net of all premiums).

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Investments

Our investment philosophy for the General Fund is to invest in an asset mix that optimizes our risk adjusted returns and matches the characteristics of our underlying liabilities. We follow a bottom-up approach which combines our strong asset management skills with an in-depth understanding of the characteristics of each investment. We invest in a diversified mix of assets, including a variety of alternative long-duration asset classes. Our diversification strategy has historically produced superior risk adjusted returns while reducing overall risk. We use a disciplined approach across all asset classes, and we do not chase yield in the riskier end of the fixed income market. Our risk management strategy is outlined in the "Risk Management" section below.

General Fund Assets

As at December 31, 2018, our General Fund invested assets totaled $353.7 billion compared with $334.2 billion at the end of 2017. The following table shows the asset class composition as at December 31, 2018 and December 31, 2017.

As at December 31, ($ billions)	2018			2017		
	Carrying value	% of total	Fair value	Carrying value	% of total	Fair value
Cash and short-term securities	**$ 16.2**	**5**	**$ 16.2**	$ 16.0	5	$ 16.0
Debt Securities and Private Placement Debt						
Government bonds	**70.0**	**20**	**70.0**	68.6	21	68.6
Corporate bonds	**112.7**	**32**	**112.7**	102.1	31	102.1
Securitized / asset-backed securities	**2.9**	**1**	**2.9**	3.3	1	3.3
Private placement debt	**35.7**	**10**	**36.1**	32.1	10	34.6
Mortgages	**48.4**	**14**	**48.6**	44.7	13	46.0
Policy loans and loans to bank clients	**8.2**	**2**	**8.2**	7.6	2	7.6
Public equities	**19.2**	**5**	**19.2**	21.5	6	21.5
Alternative Long-Duration Assets ("ALDA")						
Real Estate	**12.8**	**4**	**13.9**	13.8	4	15.0
Power & Infrastructure	**8.0**	**2**	**8.1**	7.4	2	7.4
Timberland and Farmland	**4.5**	**1**	**5.1**	5.0	2	5.2
Private Equity	**6.8**	**2**	**6.8**	4.9	1	5.0
Oil & Gas	**3.4**	**1**	**3.5**	2.8	1	2.8
Other ALDA	**0.8**	**0**	**0.8**	0.6	0	0.6
Leveraged Leases and Other	**4.1**	**1**	**4.1**	3.8	1	3.8
Total general fund invested assets	**$ 353.7**	**100**	**$ 356.2**	$ 334.2	100	$ 339.5

The carrying values for invested assets are generally equal to their fair values, however, mortgages and private placement debt are carried at amortized cost; loans to bank clients are carried at unpaid principle balances less allowance for credit losses; real estate held for own use is carried at cost less accumulated depreciation and any accumulated impairment losses; private equity investments, including power and infrastructure and timber, are accounted for as associates using the equity method, or at fair value; and oil and gas investments are carried at cost using the successful efforts method. Certain government and corporate bonds and public equities are classified as AFS.

Shareholders' accumulated other comprehensive pre-tax income (loss) at December 31, 2018 consisted of $272 million loss for bonds (2017 – loss of $176 million) and $42 million gain for public equities (2017 – gain of $553 million). Included in the $272 million loss for bonds was a $540 million loss related to the fair value hedge basis adjustments on AFS bonds (2017 – loss of $563 million).

Debt Securities and Private Placement Debt

We manage our high-quality fixed income portfolio to optimize yield and quality while ensuring that asset portfolios remain diversified by sector, industry, duration, issuer, and geography. As at December 31, 2018, our fixed income portfolio of $221.3 billion (2017 – $206.1 billion) was 98% investment grade and 75% was rated A or higher (2017 – 98% and 76%, respectively). Our private placement debt holdings provide diversification benefits (issuer, industry, and geography) and, because they often have stronger protective covenants and collateral than debt securities, they typically provide better credit protection and potentially higher recoveries in the event of default. Geographically, 27% is invested in Canada (2017 – 28%), 46% is invested in the U.S. (2017 – 47%), 3% is invested in Europe (2017 – 3%) and the remaining 24% is invested in Asia and other geographic areas (2017 – 22%).

Debt Securities and Private Placement Debt – by Credit Quality[1)]

As at December 31, ($ billions)	2018				2017			
	Debt securities	Private placement debt	Total	% of Total	Debt securities	Private placement debt	Total	% of Total
AAA	**36.1**	**1.2**	**37.3**	**17**	34.3	1.0	35.3	17
AA	**32.1**	**5.0**	**37.1**	**17**	29.0	4.2	33.2	16
A	**78.0**	**13.3**	**91.3**	**41**	76.1	12.0	88.1	43
BBB	**37.0**	**14.0**	**51.0**	**23**	32.1	13.2	45.3	22
BB	**1.6**	**0.7**	**2.3**	**1**	1.8	0.7	2.5	1
B & lower, and unrated	**0.8**	**1.5**	**2.3**	**1**	0.7	1.0	1.7	1
Total carrying value ($ billions)	**$ 185.6**	**$ 35.7**	**$ 221.3**	**100**	$ 174.0	$ 32.1	$ 206.1	100

(1) Reflects credit quality ratings as assigned by Nationally Recognized Statistical Rating Organizations ("NRSRO") using the following priority sequence order: Standard & Poor's, Moody's, Dominion Bond Rating Service, Fitch, Rating and Investment Information, and Japan Credit Rating. For those assets where ratings by NRSRO are not available, disclosures are based upon internal ratings as described in the "Risk Management" and "Risk Factors" sections below.

Debt Securities and Private Placement Debt – by Sector

As at December 31, Per cent of carrying value	2018 Debt securities	2018 Private placement debt	2018 Total	2017 Debt securities	2017 Private placement debt	2017 Total
Government and agency	**38**	**11**	**33**	39	10	35
Utilities	**14**	**44**	**19**	15	47	20
Financial	**16**	**5**	**14**	15	5	13
Industrial	**8**	**10**	**8**	7	9	7
Consumer (non-cyclical)	**6**	**13**	**7**	6	13	7
Energy – Oil & Gas	**4**	**4**	**4**	5	4	5
Energy – Other	**4**	**2**	**4**	3	1	3
Consumer (cyclical)	**3**	**7**	**3**	2	7	3
Securitized (MBS/ABS)	**2**	**1**	**2**	2	1	2
Telecommunications	**2**	**1**	**2**	2	–	2
Basic materials	**1**	**2**	**2**	2	3	1
Technology	**1**	**–**	**1**	1	–	1
Media and internet and other	**1**	**–**	**1**	1	–	1
Total per cent	**100**	**100**	**100**	100	100	100
Total carrying value ($ billions)	**$ 185.6**	**$ 35.7**	**$ 221.3**	$ 174.0	$ 32.1	$ 206.1

As at December 31, 2018, gross unrealized losses on our fixed income holdings were $4.5 billion or 2% of the amortized cost of these holdings (2017 – $1.7 billion or 1%). Of this amount, $278 million (2017 – $37 million) related to debt securities trading below 80% of amortized cost for more than 6 months. Securitized assets represented $52 million of the gross unrealized losses and none of the amounts trading below 80% of amortized cost for more than 6 months (2017 – $24 million and none, respectively). After adjusting for debt securities supporting participating policyholder and pass-through products and the provisions for credit included in the insurance and investment contract liabilities, the potential impact to shareholders' pre-tax earnings for debt securities trading at less than 80% of amortized cost for greater than 6 months was approximately $62 million as at December 31, 2018 (2017 – $30 million).

Mortgages

As at December 31, 2018, our mortgage portfolio of $48.4 billion represented 14% of invested assets (2017 – $44.7 billion and 13%, respectively). Geographically, 63% of the portfolio is invested in Canada (2017 – 63%) and 37% is invested in the U.S. (2017 – 37%). As shown below, the overall portfolio is also diversified by geographic region, property type, and borrower. Of the total mortgage portfolio, 15% is insured (2017 – 18%), primarily by the Canada Mortgage and Housing Corporation ("CMHC") – Canada's AAA rated government-backed national housing agency, with 35% of residential mortgages insured (2017 – 39%) and 2% of commercial mortgages insured (2017 – 2%).

As at December 31, ($ billions)	2018 Carrying value	2018 % of total	2017 Carrying value	2017 % of total
Commercial				
Retail	**$ 8.4**	**17**	$ 8.1	18
Office	**8.7**	**18**	7.7	17
Multi-family residential	**5.3**	**11**	4.4	10
Industrial	**2.8**	**6**	2.6	6
Other commercial	**3.0**	**6**	2.7	6
	28.2	**58**	25.5	57
Other mortgages				
Manulife Bank single-family residential	**19.6**	**41**	18.6	42
Agricultural	**0.6**	**1**	0.6	1
Total mortgages	**$ 48.4**	**100**	$ 44.7	100

Our commercial mortgage loans are originated with a hold-for-investment philosophy. They have low loan-to-value ratios, high debt-service coverage ratios, and as at December 31, 2018 there were no loans in arrears. Geographically, of the total commercial mortgage loans, 39% are in Canada and 61% are in the U.S. (2017 – 38% and 62%, respectively). We are diversified by property type and largely avoid risky market segments such as hotels, construction loans and second liens.

Non-CMHC Insured Commercial Mortgages[1]

As at December 31,	2018 Canada	2018 U.S.	2017 Canada	2017 U.S.
Loan-to-Value ratio[2]	**63%**	**57%**	63%	56%
Debt-Service Coverage ratio[2]	**1.44x**	**1.85x**	1.46x	1.84x
Average duration (years)	**4.8**	**6.2**	4.7	6.3
Average loan size ($ millions)	**$16.0**	**$19.1**	$ 14.1	$ 16.1
Loans in arrears[3]	**0.00%**	**0.00%**	0.00%	0.00%

(1) Excludes Manulife Bank commercial mortgage loans of $234 million (2017 – $109 million).
(2) Loan-to-Value and Debt-Service Coverage are based on re-underwritten cash flows.
(3) Arrears defined as over 90 days past due in Canada and over 60 days past due in the U.S.

Public Equities

As at December 31, 2018, public equity holdings of $19.2 billion represented 5% (2017 – $21.5 billion and 6%) of invested assets and, when excluding assets supporting participating policyholder and pass-through products, represented 1% (2017 – 2%) of invested assets. The portfolio is diversified by industry sector and issuer. Geographically, 28% (2017 – 31%) is held in Canada; 36% (2017 – 36%) is held in the U.S.; and the remaining 36% (2017 – 33%) is held in Asia, Europe and other geographic areas.

Public Equities – classified by type of product-line supported

As at December 31, ($ billions)	2018 Carrying value	2018 % of total	2017 Carrying value	2017 % of total
Participating Policyholders	**$ 9.3**	**48**	$ 10.2	48
Pass-through products	**4.7**	**25**	5.1	23
Corporate and Other segment[1]	**4.1**	**21**	4.9	23
Non-participating products	**1.1**	**6**	1.3	6
Total public equities	**$ 19.2**	**100**	$ 21.5	100

(1) Includes $2.5 billion of AFS equities and $1.6 billion of seed money investments in new segregated and mutual funds.

Alternative Long-Duration Assets ("ALDA")

Our ALDA portfolio is comprised of a diverse range of asset classes with varying degrees of correlations. The portfolio typically consists of private assets representing investments in varied sectors of the economy which act as a natural hedge against future inflation and serve as an alternative source of asset supply to long-term corporate bonds. In addition to being a suitable match for our long-duration liabilities, these assets provide enhanced long-term yields and diversification relative to traditional fixed income markets. The vast majority of our ALDA are managed in-house.

As at December 31, 2018, ALDA of $36.2 billion represented 10% (2017 – $34.5 billion and 10%) of invested assets. The fair value of total ALDA was $38.2 billion at December 31, 2018 (2017 – $36.0 billion). The carrying value and corresponding fair value by sector and/or asset type are outlined above (see table in the section "General Fund Assets").

Real Estate

Our real estate portfolio is diversified by geographic region; of the total fair value of this portfolio, 43% is located in the U.S., 42% in Canada, and 15% in Asia as at December 31, 2018 (2017 – 51%, 38%, and 11%, respectively). This high-quality portfolio has virtually no leverage and is primarily invested in premium urban office towers, concentrated in cities with stable growth, and highly diverse economies, in North America and Asia. The portfolio is well positioned with an average occupancy rate of 94% (2017 – 94%) and an average lease term of 5.8 years (2017 – 5.9 years). During 2018, we executed 1 acquisition representing $0.3 billion market value of commercial real estate assets (2017 – 3 acquisitions and $0.9 billion). As part of the portfolio optimization initiatives, $3.0 billion of commercial real estate assets were sold during 2018.

The composition of our real estate portfolio based on fair value is as follows:

As at December 31, ($ billions)	2018 Fair value	2018 % of total	2017 Fair value	2017 % of total
Company Own-Use	**$ 3.2**	**23**	$ 2.4	16
Office – Downtown	**5.2**	**37**	6.6	44
Office – Suburban	**1.8**	**13**	2.3	15
Industrial	**0.8**	**6**	0.9	6
Residential	**1.6**	**12**	1.7	12
Retail	**0.4**	**2**	0.3	2
Other	**0.9**	**7**	0.8	5
Total real estate[1]	**$ 13.9**	**100**	$ 15.0	100

(1)These figures represent the fair value of the real estate portfolio. The carrying value of the portfolio was $12.8 billion and $13.8 billion at December 31, 2018 and December 31, 2017, respectively.

Power & Infrastructure

We invest both directly and through funds in a variety of industry specific asset classes, listed below. The portfolio is well diversified with over 300 portfolio companies. The portfolio is predominately invested in the U.S. and Canada, but also in the United Kingdom, Europe and Australia. Our power and infrastructure holdings are as follows:

As at December 31, ($ billions)	2018		2017	
	Carrying value	% of total	Carrying value	% of total
Power generation	**$ 3.7**	**47**	$ 3.8	52
Transportation (including roads, ports)	**1.6**	**20**	1.4	19
Electric and gas regulated utilities	**1.1**	**14**	1.2	17
Electricity transmission	**0.2**	**2**	0.2	3
Water distribution	**0.2**	**2**	0.2	2
Midstream gas infrastructure	**0.4**	**5**	0.2	4
Maintenance service, efficiency and social infrastructure	**0.1**	**2**	0.2	2
Telecommunication/Tower	**0.4**	**5**	–	–
Other Infrastructure	**0.3**	**3**	0.1	1
Total power & infrastructure	**$ 8.0**	**100**	$ 7.3	100

Timberland & Farmland

Our timberland and farmland assets are managed by a proprietary entity, Hancock Natural Resources Group ("HNRG"). In addition to being the world's largest timberland investment manager for institutional investors1, with timberland properties in the U.S., New Zealand, Australia, Chile, Canada and Brazil, HNRG also manages farmland properties in the U.S., Australia and Canada. The General Fund's timberland portfolio comprised 26% of HNRG's total timberland assets under management ("AUM") (2017 – 23%). The farmland portfolio includes annual (row) crops, fruit crops, wine grapes, and nut crops. The General Fund's holdings comprised 39% of HNRG's total farmland AUM (2017 – 43%).

Private Equities

Our private equity portfolio of $6.8 billion (2017 – $4.9 billion) includes both directly held private equity and private equity funds. Both are diversified across vintage years and industry sectors.

Oil & Gas

This category is comprised of $1.1 billion (2017 – $1.2 billion) in our conventional Canadian oil and gas properties managed by our subsidiary, NAL Resources, and various other oil and gas private equity interests of $2.3 billion (2017 – $1.6 billion). Production mix for conventional oil and gas assets in 2018 was approximately 36% crude oil, 45% natural gas, and 19% natural gas liquids (2017 – 35%, 47%, and 18%, respectively). Private equity interests are a combination of both producing and mid-streaming assets.

In 2018, the carrying value of our oil and gas holdings increased $0.6 billion and the fair value increased by $0.7 billion, primarily driven by acquisitions.

Investment Income

For the years ended December 31, ($ millions, unless otherwise stated)	2018	2017
Interest income	**$ 11,081**	$ 10,577
Dividend, rental and other income	**2,829**	2,810
Impairments	**(164)**	(70)
Other, including gains and losses on sale of AFS debt securities	**(186)**	332
Investment income before realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges	**13,560**	13,649
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities and on macro equity hedges		
Debt securities	**(5,994)**	3,686
Public equities	**(1,444)**	2,235
Mortgages and private placements	**(28)**	109
Alternative long-duration assets and other investments	**662**	791
Derivatives, including macro equity hedging program	**(2,224)**	(1,103)
	(9,028)	5,718
Total investment income	**$ 4,532**	$ 19,367

In 2018, the $4.5 billion of investment income (2017 – $19.4 billion) consisted of:

- $13.6 billion of investment income before net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges (2017 – $13.7 billion); and

[1] Based on the global timber investment management organization ranking in the *RISI International Timberland Ownership and Investment Database.*

- $9.0 billion of net realized and unrealized losses on assets supporting insurance and investment contract liabilities and on macro equity hedges (2017 – gains of $5.7 billion).

The $0.1 billion decrease in net investment income before unrealized and realized gains was due to $0.1 billion higher impairments on oil & gas properties and losses of $0.2 billion on surplus assets mainly from losses on debt securities (compared with $0.3 billion gains in 2017), partially offset by $0.5 billion higher interest income primarily from increased income on debt securities.

Net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on the macro hedge program was a loss of $9.0 billion for full year 2018 compared with a gain of $5.7 billion for full year 2017. The full year 2018 loss largely resulted from interest rate increases in both North America and Asia. The 10-yr government bonds for the U.S. and Hong Kong increased 28 bps and 20 bps, respectively. Additional losses were driven by declining equity markets as all major indices were down during the year. The S&P/TSX declined 11.6% and the S&P 500 declined 6.2%.

As the measurement of insurance and investment contract liabilities includes estimates regarding future expected investment income on assets supporting insurance and investment contract liabilities, only the difference between the mark-to-market accounting on the measurement of both assets and liabilities impacts net income. Refer to “Financial Performance” above.

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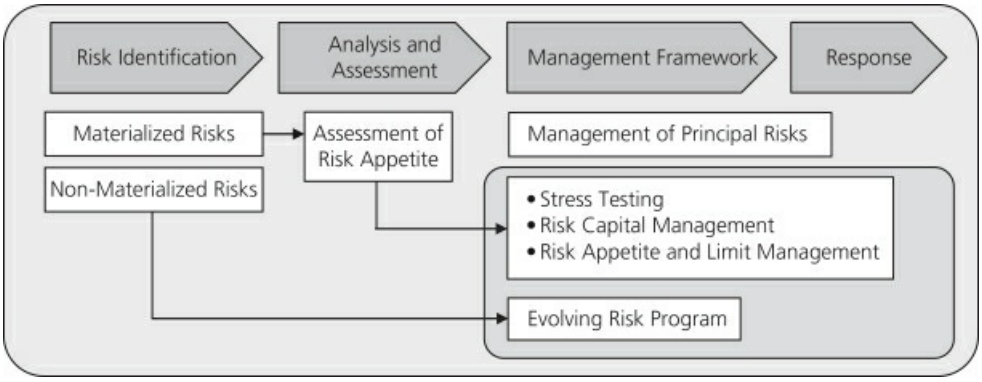
Risk Management

This section provides an overview of the Company's overall risk management approach and more specific strategies for our principal risks. A more detailed description of specific risks which may affect our results of operations or financial condition may be found in the "Risk Factors" section below.

Enterprise Risk Management Framework

Delivering on our mission "Decisions made easier. Lives made better", our ambition is to transform into the most digital, customer-centric global company in our industry, while delighting our customers, engaging our employees, and delivering superior returns for our shareholders. The activities required to achieve these results involve elements of risk taking.

Our approach to risk management is governed by our Enterprise Risk Management ("ERM") Framework.



Our ERM Framework provides a structured approach to implementing risk taking and risk management activities across the enterprise, supporting our long-term revenue, earnings and capital growth strategy. It is communicated through risk policies and standards which are intended to enable consistent design and execution of strategies across the organization. We have a common approach to managing all risks to which the Company is exposed, and to evaluating potential directly comparable risk-adjusted returns on contemplated business activities. Our risk policies and standards cover:

- Assignment of accountability and delegation of authority for risk oversight and risk management;
- The types and levels of risk the Company seeks given its strategic plan and risk appetite;
- Risk identification, measurement, assessment and mitigation which enable effective management and monitoring of risk; and
- Validation, back testing and independent oversight to confirm that the Company generated the risk profile it intended and the root cause analysis of any notable variation.

Our risk management practices are influenced and impacted by external and internal factors (such as economic conditions, political environments, technology and risk culture), which can significantly impact the levels and types of risks the Company might face in its pursuit of strategically optimized risk taking and risk management. Our ERM Framework incorporates relevant impacts and mitigating actions as appropriate.

Three Lines of Defense Model

A strong risk culture and a common approach to risk management are integral to Manulife's risk management practices. Management is responsible for managing risk within risk appetite and has established risk management strategies and monitoring practices. Our approach to risk management includes a "three lines of defense" governance model that segregates duties among risk taking activities, risk monitoring and risk oversight, and establishes appropriate accountability for those who assume risk versus those who oversee risk.

The Company's first line of defense includes the Chief Executive Officer ("CEO"), Segment General Managers and Global Function Heads. In our matrix reporting model, the Segment General Managers are ultimately accountable for their business results, the risks they assume to achieve those results, and for the day-to-day management of the risks and related controls, and the Global Function Heads are accountable for the management of the risks and related controls for their function.

The second line of defense is comprised of the Company's Chief Risk Officer ("CRO"), the Global Risk Management ("GRM") function, other global oversight functions and Segment CRO's and oversight functions. Collectively, this group provides independent oversight of risk taking and risk management activities across the enterprise. Risk oversight committees, through broad-based membership, also provide oversight of risk taking and risk management activities.

The third line of defense is Audit Services, which provides independent, objective assurance that controls are effective and appropriate relative to the risk inherent in the business and that risk mitigation programs and risk oversight functions are effective in managing risks.

Risk Culture

To enable the achievement of our goals and strategies, the Company requires a high-performing culture centered around six values:

- Obsess about Customers – Predict their needs and do everything in your power to satisfy them.
- Do the Right Thing – Act with integrity and do what you say.
- Think Big – Anything is possible. We can always find a better way.
- Get it Done Together – We're surrounded by an amazing team. Do it better by working together.
- Own it – Feel empowered to make decisions and take action to deliver our mission.
- Share your Humanity – Build a supportive, diverse and thriving workplace.

Within this context, the Company strives for a risk aware culture, where individuals and groups are encouraged, feel comfortable and are proactive in making transparent, balanced risk-return decisions that are in the long-term interests of the Company. Management establishes practices that encourage and foster a risk aware culture that addresses the following:

- Aligning personal objectives with the Company's objectives;
- Identifying and escalating risks before they become issues;
- Adopting a cooperative approach that enables appropriate risk taking;
- Ensuring transparency in identifying, communicating and tracking risks; and
- Systematically acknowledging and surfacing material risks.

Risk Governance

The Board of Directors oversees the Company's culture of integrity and ethics, strategic planning, risk management, and corporate governance, among other things. The Board of Directors carries out its responsibilities directly and through its four standing committees. The Board Risk Committee oversees the management of our principal risks, and our programs, policies and procedures to manage those risks. The Board Audit Committee oversees internal control over financial reporting and our finance, actuarial, internal audit and global compliance functions, serves as the conduct review committee, reviews our compliance with legal and regulatory requirements and oversees the performance, qualifications and independence of our external auditors. The Management Resources and Compensation Committee oversees our global human resources strategy, policies, programs, management succession, executive compensation, and pension plan governance. The Corporate Governance and Nominating Committee develops our governance policies, practices and procedures, among other things.

The CEO is directly accountable to the Board of Directors for the results and operations of the Company and all risk taking activities and risk management practices required to achieve those results. The CEO is supported by the CRO as well as by the Executive Risk Committee ("ERC"). Together, they shape and promote our risk culture, guide risk taking throughout our global operations and strategically manage our overall risk profile. The ERC, along with other executive-level risk oversight committees, establishes risk policies, guides risk taking activity, monitors significant risk exposures and sponsors strategic risk management priorities throughout the organization.

GRM, under the direction of the CRO, establishes and maintains our ERM Framework and oversees the execution of individual risk management programs across the enterprise. GRM seeks to ensure a consistent enterprise-wide assessment of risk, risk-based capital and risk-adjusted returns across all operations.

The ERC approves and oversees the execution of the Company's enterprise risk management program. It establishes and presents for approval to the Board of Directors the Company's risk appetite and enterprise-wide risk limits and monitors our overall risk profile, including key and emerging risks and risk management activities. As part of these activities, the ERC monitors material risk exposures, endorses and reviews strategic risk management priorities, and reviews and assesses the impact of business strategies, opportunities and initiatives on our overall risk position. The ERC is supported by a number of oversight sub-committees including: Credit Committee, Product Oversight Committee, Global Asset Liability Committee, and the Operational Risk Committee. We also have segment risk committees, each with mandates similar to the ERC except with a focus at the segment as applicable.

Risk Appetite

The Company's strategic direction drives overall risk appetite. All risk taking activities are managed within the Company's overall risk appetite, which defines the amount and types of risks the Company is willing to assume in pursuit of its objectives. It is comprised of three components: overall risk taking philosophy, risk appetite statements, and risk limits and tolerances.

When making decisions about risk taking and risk management, the Company places a priority on the following risk management objectives:

- Safeguarding the commitments and expectations established with our customers, creditors, shareholders and employees;
- Supporting the successful design and delivery of customer solutions;
- Prudently and effectively deploying the capital invested in the Company by shareholders with appropriate risk/return profiles; and
- Protecting and/or enhancing the Company's reputation and brand.

Risk management provides a framework for monitoring and mitigating exposures so that they are maintained within the risk appetite approved by the Board. This allows us to deploy our capital towards appropriate risk/return profiles. As an integrated component of our business model, risk management is vital in achieving our objectives and encourages organizational learning.

At least annually, we establish and/or reaffirm that our risk appetite and the Company's strategy are aligned. The risk appetite statements provide 'guideposts' on our appetite for identified risks, any conditions placed on associated risk taking and direction for where quantitative risk limits should be established. The Company's risk appetite statements are as follows:

- Manulife accepts a total level of risk that provides a very high level of confidence to meeting customer obligations while targeting an appropriate overall return to shareholders over time;
- The Company targets a credit rating amongst the strongest of its global peers;
- Manulife values innovation and encourages initiatives intended to advance the Company's ambition to be a digital, customer-centric market leader;
- Capital market risks are acceptable when they are managed within specific risk limits and tolerances;
- The Company believes a diversified investment portfolio reduces overall risk and enhances returns; therefore, it accepts credit and alternative long-duration asset related risks;
- The Company pursues product risks that add customer and shareholder value where there is competence to assess and monitor them, and for which appropriate compensation is received;
- Manulife accepts that operational risks are an inherent part of the business when managed within thresholds and tolerances of key risk indicators and will protect its business and customers' assets through cost-effective operational risk mitigation; and
- Manulife expects its officers and employees to act in accordance with the Company's values, ethics and standards; and to enhance its brand and reputation.

Risk limits and tolerances are established for risks within our risk classification framework that are inherent in our strategies in order to define the types and amount of risk the Company will assume. Risk tolerance levels are set for risks deemed to be most significant to the Company and are established in relation to economic capital, earnings-at-risk and regulatory capital required. The purpose of risk limits is to cascade the total Company risk appetite to a level that can be effectively managed. Manulife establishes stand-alone risk limits for risk categories to avoid excessive concentration in any individual risk category and to manage the overall risk profile of the organization.

Risk Identification, Measurement and Assessment

We have a common approach and process to identify, measure, and assess the risks we assume. We evaluate all potential new business initiatives, acquisitions, product offerings, reinsurance arrangements, and investment and financing transactions on a comparable risk-adjusted basis. Segments and functional groups are responsible for identifying and assessing key and emerging risks on an ongoing basis. A standard inventory of risks is used in all aspects of risk identification, measurement and assessment, and monitoring and reporting.

Risk exposures are evaluated using a variety of measures focused on both short-term net income attributed to shareholders and long-term economic value, with certain measures used across all risk categories, while others are applied only to some risks or a single risk type. Measures include stress tests such as sensitivity tests, scenario impact analyses and stochastic scenario modeling. In addition, qualitative risk assessments are performed, including for those risk types that cannot be reliably quantified.

We perform a variety of stress tests on earnings, regulatory capital ratios, economic capital, earnings-at-risk and liquidity that consider significant, but plausible, events. We also perform other integrated, complex scenario tests to assess key risks and the interaction of these risks.

Economic capital and earnings-at-risk provide measures of enterprise-wide risk that can be aggregated and compared across business activities and risk types. Economic capital measures the amount of capital required to meet obligations with a high and pre-defined confidence level. Our earnings-at-risk metric measures the potential variance from quarterly expected earnings at a particular confidence level. Economic capital and earnings-at-risk are both determined using internal models.

Risk Monitoring and Reporting

Under the direction of the CRO, GRM oversees a formal process for monitoring and reporting on all significant risks at the Company-wide level. Risk exposures are also discussed at various risk oversight committees, along with any exceptions or proposed remedial actions, as required.

On at least a quarterly basis, the ERC and the Board Risk Committee reviews risk reports that present an overview of our overall risk profile and exposures across our principal risks. The reports incorporate both quantitative risk exposure measures and sensitivities, and qualitative assessments. The reports also highlight key risk management activities and facilitate monitoring compliance with key risk policy limits.

Our Chief Actuary presents the results of the Dynamic Capital Adequacy Test to the Board of Directors annually. Our Chief Auditor reports the results of internal audits of risk controls and risk management programs to the Audit Committee semi-annually. Management reviews the implementation of key risk management strategies, and their effectiveness, with the Board Risk Committee annually.

Risk Control and Mitigation

Risk control activities are in place throughout the Company to seek to mitigate risks within established risk limits. We believe our controls, which include policies, procedures, systems and processes, are appropriate and commensurate with the key risks faced at all levels across the Company. Such controls are an integral part of day-to-day activity, business management and decision making.

GRM establishes and oversees formal review and approval processes for product offerings, insurance underwriting, reinsurance, investment activities and other material business activities, based on the nature, size and complexity of the risk taking activity involved. Authorities for assuming risk at the transaction level are delegated to specific individuals based on their skill, knowledge and experience.

Emerging Risks

The identification and assessment of our external environment for emerging risks is an important aspect of our ERM Framework, as these risks, although yet to materialize, could have the potential to have a material impact on our operations.

Our Emerging Risk Framework facilitates the ongoing identification, assessment and monitoring of emerging risks, and includes: maintaining a process that facilitates the ongoing discussion and evaluation of potential emerging risks with senior business and functional management; reviewing and validating emerging risks with the ERC; creating and executing on responses to each emerging risk based on prioritization; and monitoring and reporting on emerging risks on a regular basis.

Regulatory Capital

Effective January 1, 2018, we implemented OSFI's new capital regime ("LICAT") which, consistent with the previous Minimum Continuing Capital and Surplus Requirements, applies to our business world-wide on a group consolidated basis. We continue to meet OSFI's capital requirements and maintain capital in excess of regulatory capital levels. Changes in LICAT rules for 2019 are anticipated to have immaterial impacts.

The International Association of Insurance Supervisors ("IAIS") is expected to finalize the risk-based global Insurance Capital Standard ("ICS") during 2019. ICS will apply to all large internationally active insurance groups, and the IAIS's intention is to require annual reporting to OSFI on a confidential basis for five years, starting in 2020, before the standard becomes effective in 2025. The IAIS has also been developing a holistic framework to assess and mitigate insurance sector systemic risk, which includes reviewing the activities of insurers. It is not yet known how these proposals will affect capital requirements and Manulife's competitive position given that several key items for these developments remain under discussion.

Regulators in various jurisdictions in which we operate have embarked on reforming their respective capital regulations. We have been actively involved in the industry discussions pertaining to those changes whose impact remains uncertain.

Subsidiary Remittability Risk

We upstream capital to Manulife's parent company, MFC, to service shareholder dividends, debt interest and corporate expenses while ensuring we meet local requirements in the jurisdictions in which we operate. Current and future regulatory rules in these jurisdictions may impact remittances (either favourably or unfavourably) depending on the final form of the regulations. Macro-economic conditions also impact remittances and our overall capital position as capital may respond differently to market conditions on a consolidated group basis (i.e. LICAT) relative to local requirements.

Updates to the Ultimate Reinvestment Rate

The Canadian Actuarial Standards Board is expected to issue new assumptions with reductions to the Ultimate Reinvestment Rate ("URR") and updates to the calibration criteria for stochastic risk-free rates, in 2019. If issued, the new assumptions will be used in the valuation of our actuarial liabilities and therefore impact net income attributed to shareholders. At December 31, 2018, the current long-term URR for risk-free rates in Canada is prescribed at 3.2% (we currently use the same assumption for the U.S.). A 10 basis point reduction in the URR in all geographies, and a corresponding change to stochastic risk-free rate modeling, would reduce net income attributed to shareholders by $350 million (post-tax).[1]

IFRS 17

IFRS 17 was issued by the International Accounting Standards Board ("IASB") in May 2017. At its November 2018 meeting, the IASB tentatively decided to defer the effective date by one year to January 1, 2022. 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 standard will replace IFRS 4 "Insurance Contracts" and will materially change the recognition and measurement of insurance contracts and the corresponding presentation and disclosures of the Company's Financial Statements and MD&A. A summary of some of the key changes are outlined in the "Critical Actuarial and Accounting Policies – Future Accounting and Reporting Changes" section below. In addition, in certain jurisdictions, including Canada, the changes could have a material effect on tax and regulatory capital positions and other financial metrics that are dependent upon IFRS accounting values.

Liquidity Adequacy Requirements Guideline for Banks

OSFI has issued proposed changes to the Liquidity Adequacy Requirements (LAR) guideline applicable to Canadian Banks, with a target implementation date of January 1, 2020, and is currently in public consultation phase. The changes pertain to run-off assumptions built into regulatory liquidity metrics, particularly those relating to the stability of funding sources. The proposed changes could result in Manulife Bank being required to hold additional liquidity and the full impacts are yet to be determined subject to finalization and implementation of the revisions.

[1] See "Caution regarding forward-looking statements" above.

General Macro-Economic Risk Factors

The global macro-economic environment has a significant impact on our financial plans and ability to implement our business strategy. The macro-economic environment can be significantly impacted by the actions of both the government sector (including central banks) and the private sector. The macro-economic environment may also be affected by natural and man-made catastrophes.

Our business strategy and associated financial plans are developed by considering forecasts of economic growth, both globally and in the specific countries we operate. Actual economic growth can be significantly impacted by the macro-economic environment and can deviate significantly from forecast, thus impacting our financial results and the ability to implement our business strategy.

Changes in the macro-economic environment can also have a significant impact on financial markets, including movements in interest rates, spreads on fixed income assets and returns on public equity and ALDA assets. Our financial plan, including income projections, capital projections, and valuation of liabilities are based on certain assumptions with respect to future movements in interest rates and spreads on fixed income assets, and expected future returns from our public equity and ALDA investments. Actual experience is highly variable and can deviate significantly from our assumptions, thus impacting our financial results. In addition, actual experience that is significantly different from our assumptions and/or changes in the macro-economic environment may result in changes to the assumptions themselves which would also impact our financial results.

Specific changes in the macro-economic environment can have very different impacts across different parts of the business. For example, a rise in interest rates is generally beneficial to us in the long term but can adversely affect valuations of some ALDA assets, especially those that have returns dependent on contractual cash flows, such as real estate.

The spending and savings patterns of our customers could be significantly influenced by the macro-economic environment and could have an impact on the products and services we offer to our customers.

Customer behaviour and emergence of claims on our liabilities can be significantly impacted by the macro-economic environment. For example, a prolonged period of economic weakness could impact the health and well-being of our customers and that could result in increased claims for certain insurance risks.

The following sections describe the risk management strategies for each of our five principal risk categories: strategic risk, market risk, credit risk, product risk and operational risk.

Strategic Risk

Strategic risk is the risk of loss resulting from the inability to adequately plan or implement an appropriate business strategy, or to adapt to change in the external business, political or regulatory environment.

Risk Management Strategy

The CEO and Executive Leadership Team establish and oversee execution of business strategies and have accountability to identify and manage the risks embedded in these strategies. They are supported by a number of processes:

- Strategic business, risk and capital planning that is reviewed with the Board of Directors, Executive Leadership Team, and the ERC;
- Performance and risk reviews of all key businesses with the CEO and annual reviews with the Board of Directors;
- Risk-based capital attribution and allocation designed to encourage a consistent decision-making framework across the organization; and
- Review and approval of significant acquisitions and divestitures by the CEO and, where appropriate, the Board of Directors.

The CEO and Executive Leadership Team are ultimately responsible for our reputation; however, our employees and representatives are responsible for conducting their business activities in a manner that upholds our reputation. This responsibility is executed through an enterprise-wide reputation risk policy that specifies the oversight responsibilities of the Board of Directors and the responsibilities of executive management, communication to and education of all directors, officers, employees and representatives, including our Code of Business Conduct and Ethics, and application of guiding principles in conducting all our business activities.

Environmental, Social and Governance Risks

Environmental, social and governance (“ESG”) risks may impact our investments, underwriting, or operations, and may create a risk of loss of financial, operational, legal, or brand value to Manulife.

In 2018, we established the Manulife Executive Sustainability Council (“the Council”) to anticipate, manage and oversee relevant environmental and social risks. The Council is comprised of a sub-group of Manulife’s Executive Leadership Team and has a mandate to integrate environmental and social sustainability into culture, strategy, and decision-making. The Board’s Corporate Governance and Nominating Committee oversees the integration of sustainability into the core business and performance on ESG metrics.

Our enterprise-level approach to ESG risk management is captured in the Environmental Risk Policy that reflects the Company’s commitment to conducting all business activities in a manner that recognizes the need to preserve the natural environment. Business and functional units are responsible for procedures, protocols and due diligence standards to identify, monitor and manage ESG risks.

We report on ESG performance in our annual sustainability reports and other sources such as the Carbon Disclosure Project. Manulife also supports the Financial Stability Board’s Taskforce on Climate-Related Financial Disclosures (“TCFD”), and Manulife Asset

Management participates in the TCFD implementation pilot convened by the United Nation's Finance Program's Environmental Initiative.

Market Risk

Market risk is the risk of loss resulting from market price volatility, interest rate change, credit and swap spread changes, and adverse foreign currency rate movements. Market price volatility primarily relates to changes in prices of publicly traded equities and alternative long-duration assets. Liquidity risk, which we manage as a form of market risk, is the risk of not having access to sufficient funds or liquid assets to meet both expected and unexpected cash outflows and collateral demands.

IFRS 7 Disclosures

The shaded text and tables in this section and the following section ("Market Risk Sensitivities and Market Risk Exposure Measures") of this MD&A represent our disclosure on market and liquidity risk in accordance with IFRS 7, "Financial Instruments – Disclosures," and include a discussion on how we measure risk and our objectives, policies and methodologies for managing these risks. Therefore, the following shaded text and tables represent an integral part of our audited annual Consolidated Financial Statements for the years ended December 31, 2018 and December 31, 2017. The fact that certain text and tables are considered an integral part of the Consolidated Financial Statements does not imply that the disclosures are of any greater importance than the sections not part of the disclosure. Accordingly, the "Risk Management" disclosure should be read in its entirety.

Market Risk Management Strategy

Market risk management strategy is governed by the Global Asset Liability Committee which oversees the overall market and liquidity risk program. Our overall strategy to manage our market risks incorporates several component strategies, each targeted to manage one or more of the market risks arising from our businesses. At an enterprise level, these strategies are designed to manage our aggregate exposures to market risks against limits associated with earnings and capital volatility.

The following table outlines our key market risks and identifies the risk management strategies which contribute to managing these risks.

Risk Management Strategy	Key Market Risk				
	Publicly Traded Equity Performance Risk	Interest Rate and Spread Risk	Alternative Long-Duration Asset Performance Risk	Foreign Exchange Risk	Liquidity Risk
Product design and pricing	✓	✓	✓	✓	✓
Variable annuity guarantee dynamic hedging	✓	✓		✓	✓
Macro equity risk hedging	✓			✓	✓
Asset liability management	✓	✓	✓	✓	✓
Foreign exchange management				✓	✓
Liquidity risk management					✓

Publicly Traded Equity Performance Risk: To reduce publicly traded equity performance risk, we primarily use a variable annuity guarantee dynamic hedging strategy which is complemented by a general macro equity risk hedging strategy. Our strategies employed for variable annuity guarantee dynamic hedging and macro equity risk hedging expose the Company to additional risks. See "Risk Factors" below.

Interest Rate and Spread Risk: In general, to seek to reduce interest rate risk, we manage the duration of our fixed income investments in our liability and Corporate and Other segments by executing interest rate hedges.

ALDA Performance Risk: We seek to limit concentration risk associated with ALDA performance by investing in a diversified basket of assets including commercial real estate, timber, farmland, private equities, infrastructure, and oil and gas assets. We further diversify risk by managing investments against established investment and risk limits.

Foreign Exchange Risk: Our policy is to generally match the currency of our assets with the currency of the liabilities they support. Where assets and liabilities are not currency matched, we seek to hedge this exposure where appropriate to stabilize our capital positions and remain within our enterprise foreign exchange risk limits through the use of financial instruments such as derivatives.

Liquidity Risk: Our liquidity risk management framework is designed to provide adequate liquidity to cover cash and collateral obligations as they come due, and to sustain and grow operations in both normal and stressed conditions. We seek to mitigate liquidity risk by diversifying our business across different products, markets, geographical regions and policyholders. We design insurance products to encourage policyholders to maintain their policies in-force, to help generate a diversified and stable flow of recurring premium income. We design the policyholder termination features of our wealth management products and related investment strategies with the goal of mitigating the financial exposure and liquidity risk related to unexpected policyholder terminations. We establish and implement investment strategies intended to match the term profile of the assets to the liabilities they support, taking into account the potential for unexpected policyholder terminations and resulting liquidity needs. We have in place contingent liquidity plans that further mitigate this risk.

Product Design and Pricing Strategy

Our policies, standards, and standards of practice with respect to product design and pricing are designed with the objective of aligning our product offerings with our risk taking philosophy and risk appetite, and in particular, that incremental risk generated from new sales aligns with our strategic risk objectives and risk limits. The specific design features of our product offerings, including level of benefit guarantees, policyholder options, fund offerings and availability restrictions as well as our associated investment strategies, help to mitigate the level of underlying risk. We regularly review and modify key features within our product offerings, including premiums and fee charges with a goal of meeting profit targets and staying within risk limits. Certain of our general fund adjustable benefit products have minimum rate guarantees. The rate guarantees for any particular policy are set at the time the policy is issued and governed by insurance regulation in each jurisdiction where the products are sold. The contractual provisions allow crediting rates to be re-set at pre-established intervals subject to the established minimum crediting rate guarantees. The Company may partially mitigate the interest rate exposure by setting new rates on new business and by adjusting rates on in-force business where permitted. In addition, the Company partially mitigates this interest rate risk through its asset liability management process, product design elements, and crediting rate strategies. New product initiatives, new reinsurance arrangements and material insurance underwriting initiatives must be reviewed and approved by the CRO or key individuals within risk management functions.

Hedging Strategies for Variable Annuity and Other Equity Risks

The Company's exposure to movement in public equity market values primarily arises from variable annuity guarantees and to a smaller extent from asset-based fees and general fund public equity holdings.

Dynamic hedging is the primary hedging strategy for variable annuity market risks. Dynamic hedging is employed for new variable annuity guarantees business when written or as soon as practical thereafter.

We seek to manage public equity risk arising from other sources (not dynamically hedged) through our macro equity risk hedging strategy. We seek to manage interest rate risk arising from variable annuity business not dynamically hedged within our asset liability management strategy.

Variable Annuity Dynamic Hedging Strategy

The variable annuity dynamic hedging strategy is designed to hedge the sensitivity of variable annuity guarantee policy liabilities and available capital to fund performance (both public equity and bond funds) and interest rate movements. The objective of the variable annuity dynamic hedging strategy is to offset, as closely as possible, the change in the economic value of guarantees with the profit and loss from our hedge asset portfolio. The economic value of guarantees moves in close tandem, but not exactly, with our variable annuity guarantee policy liabilities, as it reflects best estimate liabilities and does not include any liability provisions for adverse deviations.

Our current variable annuity guarantee dynamic hedging approach is to short exchange-traded equity index and government bond futures and execute currency futures and lengthening interest rate swaps to hedge sensitivity of policy liabilities to fund performance and interest rate movements arising from variable annuity guarantees. We dynamically rebalance these hedge instruments as market conditions change, in order to maintain the hedged position within established limits. Other derivative instruments (such as equity and interest rate options) are also utilized and we may consider the use of additional hedge instruments opportunistically in the future.

Our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products. The profit (loss) on the hedge instruments will not completely offset the underlying losses (gains) related to the guarantee liabilities hedged because:

- Policyholder behaviour and mortality experience are not hedged;
- Provisions for adverse deviation in the policy liabilities are not hedged;
- A portion of interest rate risk is not hedged;
- Credit spreads may widen and actions might not be taken to adjust accordingly;
- Fund performance on a small portion of the underlying funds is not hedged due to lack of availability of effective exchange-traded hedge instruments;
- Performance of the underlying funds hedged may differ from the performance of the corresponding hedge instruments;
- Correlations between interest rates and equity markets could lead to unfavourable material impacts;
- Unfavourable hedge rebalancing costs can be incurred during periods of high volatility from equity markets, bond markets and/or interest rates. The impact is magnified when these impacts occur concurrently; and
- Not all other risks are hedged.

Macro Equity Risk Hedging Strategy

The objective of the macro equity risk hedging program is to maintain our overall earnings sensitivity to public equity market movements within our Board approved risk appetite limits. The macro equity risk hedging program is designed to hedge earnings sensitivity due to movements in public equity markets arising from all sources (outside of dynamically hedged exposures). Sources of equity market sensitivity addressed by the macro equity risk hedging program include:

- Residual equity and currency exposure from variable annuity guarantees not dynamically hedged;
- General fund equity holdings backing non-participating liabilities; and
- Unhedged provisions for adverse deviation related to variable annuity guarantees dynamically hedged.

Asset Liability Management Strategy

Our asset liability management strategy is designed to help ensure that the market risks embedded in our assets and liabilities held in the Company's general fund are effectively managed and that risk exposures arising from these assets and liabilities are maintained within risk limits. The embedded market risks include risks related to the level and movement of interest rates and credit and swap spreads, public equity market performance, ALDA performance and foreign exchange rate movements.

General fund product liabilities are categorized into groups with similar characteristics in order to support them with a specific asset strategy. We seek to align the asset strategy for each group to the premium and benefit pattern, policyholder options and guarantees, and crediting rate strategies of the products they support. Similar strategies are established for assets in the Company's surplus account. The strategies are set using portfolio analysis techniques intended to optimize returns, subject to considerations related to regulatory and economic capital requirements, and risk tolerances. They are designed to achieve broad diversification across asset classes and individual investment risks while being suitably aligned with the liabilities they support. The strategies encompass asset mix, quality rating, term profile, liquidity, currency and industry concentration targets.

Products which feature guaranteed liability cash flows (i.e. where the projected net flows are not materially dependent upon economic scenarios) are managed to a target return investment strategy. The products backed by this asset group include:

- Accumulation annuities (other than annuities with pass-through features), which are primarilyshort-to-medium-term obligations and offer interest rate guarantees for specified terms on single premiums. Withdrawals may or may not have market value adjustments;
- Payout annuities, which have no surrender options and include predictable and very long-dated obligations; and
- Insurance products, with recurring premiums extending many years in the future, and which also include a significant component of very long-dated obligations.

We seek to manage the assets backing these long-dated benefits to achieve a target return sufficient to support the obligations over their lifetime, subject to established risk tolerances, by investing in a basket of diversified alternative long-duration assets, which may include public equity investments ("ALDA and public equity"), with the balance invested in fixed income. Utilizing ALDA and public equity investments provides a suitable match for long-duration liabilities that also enhances long-term investment returns and reduces aggregate risk through diversification.

Fixed income assets are managed to a benchmark developed to minimize interest rate risk against the liability cash flows not supported by ALDA and public equity investments, and to achieve target returns/spreads required to preserve long-term interest rate investment assumptions used in liability pricing.

For insurance and annuity products where significant pass-through features exist, a total return strategy approach is used, generally combining fixed income with ALDA plus public equity investments. ALDA and public equity may be included to enhance long-term investment returns and reduce aggregate risk through diversification. Target investment strategies are established using portfolio analysis techniques that seek to optimize long-term investment returns while considering the risks related to embedded product guarantees and policyholder withdrawal options, the impact of regulatory and economic capital requirements and management tolerances with respect to short-term income volatility and long-term tail risk exposure. For these pass-through products such as participating insurance and universal life insurance and fixed deferred annuities, the investment performance of assets supporting the liabilities will be largely passed through to policyholders as changes in the amounts of dividends declared or rates of interest credited, subject to embedded minimum guarantees. Shorter duration liabilities such as fixed deferred annuities do not incorporate ALDA plus public equity into their target asset mixes. Authority to manage our investment portfolios is delegated to investment professionals who manage to benchmarks derived from the target investment strategies established for each group, including interest rate risk tolerances.

Our asset liability management strategy incorporates a wide variety of risk measurement, risk mitigation and risk management, and hedging processes. The liabilities and risks to which the Company is exposed, however, cannot be completely matched or hedged due to both limitations on instruments available in investment markets and uncertainty of impact on liability cash flows from policyholder experience/behaviour.

Foreign Exchange Risk Management Strategy

Our policy is to generally match the currency of our assets with the currency of the liabilities they support. Where assets and liabilities are not currency matched, we seek to hedge this exposure where appropriate to stabilize our capital positions and remain within our enterprise foreign exchange risk limits through the use of financial instruments such as derivatives.

Risk from small balance sheet mismatches is accepted if managed within set risk limits. Risk exposures are measured in terms of potential changes in capital ratios, due to foreign exchange rate movements, determined to represent a specified likelihood of occurrence based on internal models.

Liquidity Risk Management Strategy

Global liquidity management policies and procedures are designed to provide adequate liquidity to cover cash and collateral obligations as they come due, and to sustain and grow operations in both normal and stressed conditions. They reflect legal, regulatory, tax, operational or economic impediments to inter-entity funding. The asset mix of our balance sheet takes into account the need to hold adequate unencumbered and appropriate liquid assets to satisfy the requirements arising under stressed scenarios and to allow our liquidity ratios to remain strong. We manage liquidity centrally and closely monitor the liquidity positions of our principal subsidiaries.

We seek to mitigate liquidity risk by diversifying our business across different products, markets, geographical regions and policyholders. We design insurance products to encourage policyholders to maintain their policies in-force, to help generate a diversified and stable flow of recurring premium income. We design the policyholder termination features of our wealth management products and related investment strategies with the goal of mitigating the financial exposure and liquidity risk related to unexpected policyholder terminations. We establish and implement investment strategies intended to match the term profile of the assets to the liabilities they support, taking into account the potential for unexpected policyholder terminations and resulting liquidity needs. Liquid assets represent a large portion of our total assets. We aim to reduce liquidity risk in our deposit funded businesses by diversifying our funding sources and appropriately managing the term structure of our funding. We forecast and monitor daily operating liquidity and cash movements in various individual entities and operations as well as centrally, aiming to ensure liquidity is available and cash is employed optimally.

We also maintain centralized cash pools and access to other sources of liquidity and contingent liquidity such as repurchase funding agreements. Our centralized cash pool consists of cash or near-cash, high quality short-term investments that are continually monitored for their credit quality and market liquidity.

We have established a variety of contingent liquidity sources. We maintain a $500 million committed unsecured revolving credit facility with certain Canadian chartered banks available for MFC, and a US$500 million committed unsecured revolving credit facility with certain U.S. banks available for MFC and certain of its subsidiaries. There were no outstanding borrowings under these credit facilities as of December 31, 2018. In addition, John Hancock (“JH”) USA is a member of the Federal Home Loan Bank of Indianapolis (“FHLBI”), which enables the Company to obtain loans from FHLBI as an alternative source of liquidity that is collaterizable by qualifying mortgage loans, mortgage-backed securities and U.S. Treasury and Agency securities. Based on regulatory limitations, as of December 31, 2018, JHUSA had an estimated maximum borrowing capacity of US$3.8 billion under the FHLBI facility, with no amounts outstanding.

The following table outlines the maturity of the Company’s significant financial liabilities.

Maturity of financial liabilities[1]

As at December 31, 2018 ($ millions)	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Long-term debt	$ –	$ 681	$ –	$4,088	$ 4,769
Capital instruments	–	–	–	8,732	8,732
Derivatives	359	229	227	6,988	7,803
Deposits from Bank clients[2]	15,351	2,147	2,185	1	19,684
Lease obligations	129	203	93	150	575

(1) The amounts shown above are net of the related unamortized deferred issue costs.

(2) Carrying value and fair value of deposits from Bank clients as at December 31, 2018 was $19,684 million and $19,731 million, respectively (2017 – $18,131 million and $18,149 million, respectively). Fair value is determined by discounting contractual cash flows, using market interest rates currently offered for deposits with similar terms and conditions. All deposits from Bank clients were categorized in Level 2 of the fair value hierarchy (2017 – Level 2).

Through the normal course of business, pledging of assets is required to comply with jurisdictional regulatory and other requirements including collateral pledged to partially mitigate derivative counterparty credit risk, assets pledged to exchanges as initial margin and assets held as collateral for repurchase funding agreements. Total unencumbered assets were $427.9 billion as at December 31, 2018 (2017 – $396.8 billion).

Market Risk Sensitivities and Market Risk Exposure Measures

Variable Annuity and Segregated Fund Guarantees Sensitivities and Risk Exposure Measures

Guarantees on variable annuity products and segregated funds may include one or more of death, maturity, income and withdrawal guarantees. Variable annuity and segregated fund guarantees are contingent and only payable upon the occurrence of the relevant event, if fund values at that time are below guaranteed values. Depending on future equity market levels, liabilities on current in-force business would be due primarily in the period from 2019 to 2039.

We seek to mitigate a portion of the risks embedded in our retained (i.e. net of reinsurance) variable annuity and segregated fund guarantee business through the combination of our dynamic and macro hedging strategies (see “Publicly Traded Equity Performance Risk” below).

The table below shows selected information regarding the Company’s variable annuity and segregated fund investment-related guarantees gross and net of reinsurance.

Variable annuity and segregated fund guarantees, net of reinsurance

As at December 31, ($ millions)	2018 Guarantee value	2018 Fund value	2018 Amount at risk[4],[5]	2017 Guarantee value	2017 Fund value	2017 Amount at risk[4], [5]
Guaranteed minimum income benefit[1]	**$ 5,264**	**$ 3,675**	**$ 1,593**	$ 5,201	$ 4,195	$ 1,074
Guaranteed minimum withdrawal benefit	**60,494**	**49,214**	**11,388**	61,767	56,512	5,943
Guaranteed minimum accumulation benefit	**18,611**	**18,720**	**141**	18,162	18,705	11
Gross living benefits[2]	**84,369**	**71,609**	**13,122**	85,130	79,412	7,028
Gross death benefits[3]	**10,663**	**14,654**	**1,567**	10,743	16,973	1,001
Total gross of reinsurance	**95,032**	**86,263**	**14,689**	95,873	96,385	8,029
Living benefits reinsured	**4,515**	**3,173**	**1,343**	4,522	3,667	911
Death benefits reinsured	**2,353**	**2,070**	**493**	3,014	3,040	435
Total reinsured	**6,868**	**5,243**	**1,836**	7,536	6,707	1,346
Total, net of reinsurance	**$ 88,164**	**$ 81,020**	**$ 12,853**	$ 88,337	$ 89,678	$ 6,683

(1) Contracts with guaranteed long-term care benefits are included in this category.
(2) Where a policy includes both living and death benefits, the guarantee in excess of the living benefit is included in the death benefit category as outlined in footnote 3.
(3) Death benefits include stand-alone guarantees and guarantees in excess of living benefit guarantees where both death and living benefits are provided on a policy.
(4) Amount at risk (in-the-money amount) is the excess of guarantee values over fund values on all policies where the guarantee value exceeds the fund value. This amount is not currently payable. For guaranteed minimum death benefit, the amount at risk is defined as the current guaranteed minimum death benefit in excess of the current account balance. For guaranteed minimum income benefit, the amount at risk is defined as the excess of the current annuitization income base over the current account value. For all guarantees, the amount at risk is floored at zero at the single contract level.
(5) The amount at risk net of reinsurance at December 31, 2018 was $12,853 million (2017 – $6,683 million) of which: US$6,899 million (2017 – US$3,982 million) was on our U.S. business, $2,654 million (2017 – $1,342 million) was on our Canadian business, US$332 million (2017 – US$95 million) was on our Japan business and US$246 million (2017 – US$181 million) was related to Asia (other than Japan) and our run-off reinsurance business.

Investment categories for variable contracts with guarantees

Variable contracts with guarantees, including variable annuities and variable life, are invested, at the policyholder’s discretion subject to contract limitations, in various fund types within the segregated fund accounts and other investments. The account balances by investment category are set out below.

As at December 31, ($ millions) Investment category	2018	2017
Equity funds	**$ 43,528**	$ 47,508
Balanced funds	**41,625**	47,369
Bond funds	**12,309**	13,095
Money market funds	**2,107**	1,905
Other fixed interest rate investments	**1,997**	1,777
Total	**$ 101,566**	$ 111,654

Caution Related to Sensitivities

In the sections that follow, we provide sensitivities and risk exposure measures for certain risks. These include sensitivities due to specific changes in market prices and interest rate levels projected using internal models as at a specific date and are measured relative to a starting level reflecting the Company's assets and liabilities at that date and the actuarial factors, investment activity and investment returns assumed in the determination of policy liabilities. The risk exposures measure the impact of changing one factor at a time and assume that all other factors remain unchanged. Actual results can differ significantly 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; actual experience differing from the assumptions, changes in business mix, effective tax rates and other market factors; and the general limitations of our internal models. For these reasons, the sensitivities should only be viewed as directional estimates of the underlying sensitivities for the respective factors based on the assumptions outlined below. Given the nature of these calculations, we cannot provide assurance that the actual impact on net income attributed to shareholders or on MLI's LICAT total ratio will be as indicated. Market movements affect LICAT capital sensitivities both through income and other components of the regulatory capital framework. For example, LICAT is affected by changes to other comprehensive income.

Publicly Traded Equity Performance Risk Sensitivities and Exposure Measures

As outlined above, the macro hedging strategy is designed to mitigate public equity risk arising from variable annuity guarantees not dynamically hedged and from other products and fees. In addition, our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products.

The table below shows the potential impact on net income attributed to shareholders resulting from an immediate 10%, 20% and 30% change in market values of publicly traded equities followed by a return to the expected level of growth assumed in the valuation of policy liabilities. If market values were to remain flat for an entire year, the potential impact would be roughly equivalent to an immediate decline in market values equal to the expected level of annual growth assumed in the valuation of policy liabilities. Further, if after market values dropped 10%, 20% or 30% they continued to decline, remained flat, or grew more slowly than assumed in the valuation the potential impact on net income attributed to shareholders could be considerably more than shown. Refer to "Sensitivity of Earnings to Changes in Assumptions" for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions. The potential impact is shown after taking into account the impact of the change in markets on the hedge assets. While we cannot reliably estimate the amount of the change in dynamically hedged variable annuity guarantee liabilities that will not be offset by the profit or loss on the dynamic hedge assets, we make certain assumptions for the purposes of estimating the impact on net income attributed to shareholders.

This estimate assumes that the performance of the dynamic hedging program would not completely offset the gain/loss from the dynamically hedged variable annuity guarantee liabilities. It assumes that the hedge assets are based on the actual position at the period end, and that equity hedges in the dynamic program are rebalanced at 5% intervals. In addition, we assume that the macro hedge assets are rebalanced in line with market changes.

It is also important to note that these estimates are illustrative, and that the hedging program may underperform these estimates, particularly during periods of high realized volatility and/or periods where both interest rates and equity market movements are unfavourable.

The Standards of Practice for the valuation of insurance contract liabilities and guidance published by the CIA constrain the investment return assumptions for public equities and certain ALDA assets based on historical return benchmarks for public equities. The potential impact on net income attributed to shareholders does not take into account possible changes to investment return assumptions resulting from the impact of declines in public equity market values on these historical return benchmarks.

Potential immediate impact on net income attributed to shareholders arising from changes to public equity returns[1],[2],[3]

As at December 31, 2018 ($ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders[4]						
Variable annuity guarantees	**$ (3,650)**	**$ (2,240)**	**$ (1,040)**	**$ 890**	**$ 1,610**	**$ 2,170**
Asset based fees (annualized)	**(480)**	**(320)**	**(160)**	**160**	**320**	**480**
General fund equity investments[5]	**(1,150)**	**(780)**	**(390)**	**290**	**580**	**860**
Total underlying sensitivity before hedging	**(5,280)**	**(3,340)**	**(1,590)**	**1,340**	**2,510**	**3,510**
Impact of macro and dynamic hedge assets[6]	**3,110**	**1,940**	**910**	**(820)**	**(1,450)**	**(1,930)**
Net potential impact on net income attributed to shareholders after impact of hedging	**$ (2,170)**	**$ (1,400)**	**$ (680)**	**$ 520**	**$ 1,060**	**$ 1,580**

As at December 31, 2017 ($ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders[4]						
Variable annuity guarantees	$ (3,940)	$ (2,260)	$ (960)	$ 670	$ 1,110	$ 1,410
Asset based fees (annualized)	(510)	(340)	(170)	170	340	510
General fund equity investments[5]	(930)	(590)	(270)	270	540	810
Total underlying sensitivity before hedging	(5,380)	(3,190)	(1,400)	1,110	1,990	2,730
Impact of macro and dynamic hedge assets[6]	3,220	1,850	790	(640)	(1,100)	(1,410)
Net potential impact on net income attributed to shareholders after impact of hedging	$ (2,160)	$ (1,340)	$ (610)	$ 470	$ 890	$ 1,320

(1) See "Caution Related to Sensitivities" above.
(2) The tables show the potential impact on net income attributed to shareholders resulting from an immediate 10%, 20% and 30% change in market values of publicly traded equities followed by a return to the expected level of growth assumed in the valuation of policy liabilities.
(3) Please refer to "Sensitivity of Earnings to Changes in Assumptions" for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions.
(4) Defined as earnings sensitivity to a change in public equity markets including settlements on reinsurance contracts, but before the offset of hedge assets or other risk mitigants.
(5) This impact for general fund equities is calculated as at a point-in-time and does not include: (i) any potential impact on public equity weightings; (ii) any gains or losses on AFS public equities held in the Corporate and Other segment; or (iii) any gains or losses on public equity investments held in Manulife Bank. 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 equity markets.
(6) Includes the impact of rebalancing equity hedges in the macro and dynamic hedging program. The impact of dynamic hedge rebalancing represents the impact of rebalancing equity hedges for dynamically hedged variable annuity guarantee best estimate liabilities at 5% intervals but does not include any impact in respect of other sources of hedge ineffectiveness (e.g. fund tracking, realized volatility and equity, interest rate correlations different from expected among other factors).

Changes in equity markets impact our available and required components of the LICAT total ratio. The following table shows the potential impact to MLI's LICAT total ratio resulting from changes in public equity market values.

Potential immediate impact on MLI's LICAT total ratio arising from public equity returns different than the expected return for policy liability valuation[1],[2],[3]

	Impact on MLI's LICAT total ratio					
Percentage points	-30%	-20%	-10%	+10%	+20%	+30%
December 31, 2018	**(6)**	**(4)**	**(2)**	**1**	**5**	**7**
March 31, 2018	(6)	(4)	(2)	2	4	6

(1) See "Caution Related to Sensitivities" above. In addition, estimates exclude changes to the net actuarial gains/losses with respect to the Company's pension obligations as a result of changes in equity markets, as the impact on the quoted sensitivities is not considered to be material.
(2) The potential impact is shown assuming that the change in value of the hedge assets does not completely offset the change in the dynamically hedged variable annuity guarantee liabilities. The estimated amount that would not be completely offset relates to our practices of not hedging the provisions for adverse deviation and of rebalancing equity hedges for dynamically hedged variable annuity liabilities at 5% intervals.
(3) OSFI rules for segregated fund guarantees reflect full capital impacts of shocks over 20 quarters within a prescribed range. As such, the deterioration in equity markets could lead to further increases in capital requirements after the initial shock.

Interest Rate and Spread Risk Sensitivities and Exposure Measures

At December 31, 2018, we estimated the sensitivity of our net income attributed to shareholders to a 50 basis point parallel decline in interest rates to be a charge of $100 million, and to a 50 basis point increase in interest rates to be a benefit of $100 million.

The table below shows the potential impact on net income attributed to shareholders from a 50 basis point parallel move in interest rates. This includes a change of 50 basis points in current government, swap and corporate rates for all maturities across all markets with no change in credit spreads between government, swap and corporate rates, and with a floor of zero on government rates where government rates are not currently negative, relative to the rates assumed in the valuation of policy liabilities, including embedded derivatives. For variable annuity guarantee liabilities that are dynamically hedged, it is assumed that interest rate hedges are rebalanced at 20 basis point intervals.

As the sensitivity to a 50 basis point change in interest rates includes any associated change in the applicable reinvestment scenarios, the impact of changes to interest rates for less than, or more than 50 basis points is unlikely to be linear. Furthermore, our sensitivities are not consistent across all regions in which we operate, and the impact of yield curve changes will vary depending upon the geography where the change occurs. Reinvestment assumptions used in the valuation of policy liabilities tend to amplify the negative effects of a decrease in interest rates and dampen the positive effects of interest rate increases. This is because the reinvestment assumptions used in the valuation of our insurance liabilities are based on interest rate scenarios and calibration criteria set by the Canadian Actuarial Standards Board, while our interest rate hedges are valued using current market interest rates. Therefore, in any particular quarter, changes to the reinvestment assumptions are not fully aligned to changes in current market interest rates especially when there is a significant change in the shape of the interest rate curve. As a result, the impact from non-parallel movements may be materially different from the estimated impact of parallel movements. For example, if long-term interest rates increase more than short-term interest rates (sometimes referred to as a steepening of the yield curve) in North America, the decrease in the value of our swaps may be greater than the decrease in the value of our insurance liabilities. This could result in a charge to net income attributed to shareholders in the short-term even though the rising and steepening of the yield curve, if sustained, may have a positive long-term economic impact.

The potential impact on net income attributed to shareholders does not take into account any future potential changes to our URR assumptions or calibration criteria for stochastic risk-free rates or other potential impacts of lower interest rate levels, for example, increased strain on the sale of new business or lower interest earned on our surplus assets. The impact also does not reflect any unrealized gains or losses on AFS fixed income assets held in our Corporate and Other segment. Changes in the market value of these assets may provide a natural economic offset to the interest rate risk arising from our product liabilities. In order for there to also be an accounting offset, the Company would need to realize a portion of the AFS fixed income asset unrealized gains or losses. It is not certain we would crystallize any of the unrealized gains or losses available.

The impact does not reflect any potential effect of changing interest rates to the value of our ALDA assets. Rising interest rates could negatively impact the value of our ALDA assets (see “Critical Accounting and Actuarial Policies – Fair Value of Invested Assets”, below). More information on ALDA can be found under the section “Alternative Long-Duration Asset Performance Risk Sensitivities and Exposure Measures”, below.

Under LICAT, changes in unrealized gains or losses in our AFS bond portfolio resulting from interest rate shocks tend to dominate capital sensitivities. As a result, the reduction in interest rates improves LICAT total ratios and vice-versa.

The following table shows the potential impact on net income attributed to shareholders including the change in the market value of AFS fixed income assets held in our Corporate and Other segment, which could be realized through the sale of these assets.

Potential impact on net income attributed to shareholders and MLI's LICAT total ratio of an immediate parallel change in interest rates relative to rates assumed in the valuation of policy liabilities[1],[2],[3],[4]

As at December 31,	2018 -50bp	2018 +50bp	2017 -50bp	2017 +50bp
Net income attributed to shareholders ($ millions)				
Excluding change in market value of AFS fixed income assets held in the Corporate and Other segment	**$ (100)**	**$ 100**	$ (200)	$ 100
From fair value changes in AFS fixed income assets held in the Corporate and Other segment, if realized	**1,600**	**(1,500)**	1,100	(1,000)
MLI's LICAT total ratio (Percentage points)				
LICAT total ratio change in percentage points[5]	3	(3)	n/a	n/a

(1) See "Caution Related to Sensitivities" above. In addition, estimates exclude changes to the net actuarial gains/losses with respect to the Company's pension obligations as a result of changes in interest rates, as the impact on the quoted sensitivities is not considered to be material.
(2) Includes guaranteed insurance and annuity products, including variable annuity contracts as well as adjustable benefit products where benefits are generally adjusted as interest rates and investment returns change, a portion of which have minimum credited rate guarantees. For adjustable benefit products subject to minimum rate guarantees, the sensitivities are based on the assumption that credited rates will be floored at the minimum.
(3) The amount of gain or loss that can be realized on AFS fixed income assets held in the Corporate and Other segment will depend on the aggregate amount of unrealized gain or loss.
(4) Sensitivities are based on projected asset and liability cash flows and the impact of realizing fair value changes in AFS fixed income is based on the holdings at the end of the period.
(5) Includes all LICAT impacts, including realized and unrealized fair value changes in AFS fixed income assets. The LICAT ratio is not applicable before January 1, 2018.

The $100 million decrease in sensitivity to a 50 basis point decline in interest rates from December 31, 2017 was primarily due to purchases of fixed income assets from sales of ALDA (due to reducing the allocation to ALDA in our portfolio asset mix) in the U.S., which reduced the reinvestment exposure to interest rates.

The following tables show the potential impact on net income attributed to shareholders resulting from a change in corporate spreads and swap spreads over government bond rates for all maturities across all markets with a floor of zero on the total interest rate, relative to the spreads assumed in the valuation of policy liabilities.

Potential impact on net income attributed to shareholders and MLI's LICAT total ratio arising from changes to corporate spreads and swap spreads[1],[2],[3]

Corporate spreads[4],[5] As at December 31,	2018 -50bp	2018 +50bp	2017 -50bp	2017 +50bp
Net income attributed to shareholders ($ millions)	**$ (600)**	**$ 600**	$ (1,000)	$ 1,000
MLI's LICAT total ratio (change percentage points)[6]	**(6)**	**6**	n/a	n/a

Swap spreads As at December 31,	2018 -20bp	2018 +20bp	2017 -20bp	2017 +20bp
Net income attributed to shareholders ($ millions)	**$ 100**	**$ (100)**	$ 400	$ (400)
MLI's LICAT total ratio (change percentage points)[6]	**nil**	**nil**	n/a	n/a

(1) See "Caution Related to Sensitivities" above.
(2) The impact on net income attributed to shareholders assumes no gains or losses are realized on our AFS fixed income assets held in the Corporate and Other segment and excludes the impact of changes in segregated fund bond values due to changes in credit spreads. 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 corporate and swap spreads.
(3) Sensitivities are based on projected asset and liability cash flows.
(4) Corporate spreads are assumed to grade to the long-term average over five years.
(5) As the sensitivity to a 50 basis point decline in corporate spreads includes the impact of a change in deterministic reinvestment scenarios where applicable, the impact of changes to corporate spreads for less than, or more than, the amounts indicated are unlikely to be linear.
(6) Includes all LICAT impacts, including realized and unrealized fair value changes in AFS fixed income assets. Under LICAT, spread movements are determined from a selection of investment grade bond indices with BBB and better bonds for each jurisdiction. For LICAT, we use the following indices: FTSE TMX Canada All Corporate Bond Index, Barclays USD Liquid Investment Grade Corporate Index, and Nomura-BPI (Japan). The LICAT ratio is not applicable before January 1, 2018.

The $400 million decrease in the sensitivity to a 50 basis point decline in corporate spreads from December 31, 2017 was primarily due to purchases of fixed income assets from sales of ALDA (due to reducing the allocation to ALDA in our portfolio asset mix) in the U.S., which reduced the reinvestment exposure to corporate spreads.

Swap spreads remain at low levels, and if they were to rise, this could generate material charges to net income attributed to shareholders. Swap spread sensitivity decreased primarily due to additional shortening swaps put in place.

Alternative Long-Duration Asset Performance Risk Sensitivities and Exposure Measures

The following table shows the potential impact on net income attributed to shareholders resulting from an immediate 10% change in market values of ALDA followed by a return to the expected level of growth assumed in the valuation of policy liabilities. If market values were to remain flat for an entire year, the potential impact would be roughly equivalent to an immediate decline in market values equal to the expected level of annual growth assumed in the valuation of policy liabilities. Further, if after market values dropped 10% they continued to decline, remained flat, or grew more slowly than assumed in the valuation of policy liabilities, the potential impact on net income attributed to shareholders could be considerably more than shown. Refer to "Sensitivity of Earnings to Changes in Assumptions" below, for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions.

ALDA includes commercial real estate, timber and farmland real estate, oil and gas direct holdings, and private equities, some of which relate to oil and gas.

Potential impact on net income attributed to shareholders arising from changes in ALDA returns[1],[2],[3],[4],[5],[6]

As at December 31, ($ millions)	2018 -10%	2018 +10%	2017 -10%	2017 +10%
Real estate, agriculture and timber assets	**$ (1,300)**	**$ 1,200**	$ (1,300)	$ 1,300
Private equities and other ALDA	**(1,600)**	**1,600**	(1,500)	1,400
Alternative long-duration assets	**$ (2,900)**	**$ 2,800**	$ (2,800)	$ 2,700

(1) See "Caution Related to Sensitivities" above.
(2) This impact is calculated as at a point-in-time impact and does not include: (i) any potential impact on ALDA weightings or (ii) any gains or losses on ALDA held in the Corporate and Other segment.
(3) 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 ALDA returns. For some classes of ALDA, where there is not an appropriate long-term benchmark available, the return assumptions used in valuation are not permitted by the Standards of Practice and CIA guidance to result in a lower reserve than an assumption based on a historical return benchmark for public equities in the same jurisdiction.
(4) Net income impact does not consider any impact of the market correction on assumed future return assumptions.
(5) Please refer to "Sensitivity of Earnings to Changes in Assumptions" below, for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions.
(6) The impact of changes to the portfolio asset mix supporting our North American legacy business are reflected in the sensitivities when the changes take place.

Foreign Exchange Risk Sensitivities and Exposure Measures

We generally match the currency of our assets with the currency of the insurance and investment contract liabilities they support, with the objective of mitigating risk of loss arising from currency exchange rate changes. As at December 31, 2018, we did not have a material unmatched currency exposure.

The following table shows the potential impact on core earnings of a 10% change in the Canadian dollar relative to our other key operating currencies.

Potential impact on core earnings of changes in currency[1],[2]

As at December 31, ($ millions)	2018 +10% strengthening	2018 -10% weakening	2017 +10% strengthening	2017 -10% weakening
10% change in the Canadian dollar relative to the U.S. dollar and the Hong Kong dollar	**$ (340)**	**$ 340**	$ (280)	$ 280
10% change in the Canadian dollar relative to the Japanese yen	**(60)**	**60**	(60)	60

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.
(2) See "Caution Related to Sensitivities" above.

LICAT regulatory capital ratios are also sensitive to the fluctuations in the Canadian dollar relative to our other key operating currencies. The direction and materiality of this sensitivity varies across various capital ratios.

Liquidity Risk Exposure Measures

We manage liquidity levels of the consolidated group and key subsidiaries against established thresholds. We measure liquidity under both immediate (within one month) and ongoing (within one year) stress scenarios. Our policy is to maintain the ratio of assets to liabilities, both adjusted for their liquidity values, above the pre-established limit.

Increased use of derivatives for hedging purposes has necessitated greater emphasis on measurement and management of contingent liquidity risk related to these instruments, in particular the movement of "over-the-counter" derivatives to central clearing in the U.S. and Japan places an emphasis on cash as the primary source of liquidity as opposed to security holdings. The market value of our derivative portfolio is therefore regularly stress tested to assess the potential collateral and cash settlement requirements under various market conditions.

Manulife Bank (the "Bank") has a stand-alone liquidity risk management policy framework. The framework includes stress testing, cash flow modeling, a funding plan and a contingency plan. The Bank has an established securitization infrastructure which enables the Bank to access a range of funding and liquidity sources. The Bank models extreme but plausible stress scenarios that demonstrate that the Bank has a sufficient pool of highly liquid money market securities and holdings of sovereign bonds, near-sovereign bonds and other liquid marketable securities, which when combined with the Bank's capacity to securitize residential mortgage assets provides sufficient liquidity to meet potential requirements under these stress scenarios.

Credit Risk

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

Credit Risk Management Strategy

Credit risk is governed by the Credit Committee which oversees the overall credit risk management program. The Company has established objectives for overall quality and diversification of our general fund investment portfolio and criteria for the selection of counterparties, including derivative counterparties, reinsurers and insurance providers. Our policies establish exposure limits by borrower, corporate connection, quality rating, industry, and geographic region, and govern the usage of credit derivatives. Corporate connection limits vary according to risk rating. Our general fund fixed income investments are primarily public and private investment grade bonds and commercial mortgages. We have a program for selling Credit Default Swaps ("CDS") that employs a highly selective, diversified and conservative approach. CDS decisions follow the same underwriting standards as our cash bond portfolio and the addition of this asset class allows us to better diversify our overall credit portfolio.

Our credit granting units follow a defined evaluation process that provides an objective assessment of credit proposals. We assign a risk rating, based on a standardized 22-point scale consistent with those of external rating agencies, following a detailed examination of the borrower that includes a review of business strategy, market competitiveness, industry trends, financial strength, access to funds, and other risks facing the counterparty. We assess and update risk ratings regularly. For additional input to the process, we also assess credit risks using a variety of industry standard market-based tools and metrics. We map our risk ratings to pre-established probabilities of default and loss given defaults, based on historical industry and Company experience, and to resulting default costs.

We establish delegated credit approval authorities and make credit decisions on a case-by-case basis at a management level appropriate to the size and risk level of the transaction, based on the delegated authorities that vary according to risk rating. Major credit decisions are approved by the Credit Committee and the largest decisions are approved by the CEO and, in certain cases, by the Board of Directors.

We limit the types of authorized derivatives and applications and require pre-approval of all derivative application strategies and regular monitoring of the effectiveness of derivative strategies. Derivative counterparty exposure limits are established based on a minimum acceptable counterparty credit rating (generally A- from internationally recognized rating agencies). We measure 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 net of collateral held. The creditworthiness of all reinsurance counterparties is reviewed internally on a regular basis.

Regular reviews of the credits within the various portfolios are undertaken with the goal of identifying changes to credit quality and, where appropriate, taking corrective action. Prompt identification of problem credits is a key objective.

We establish an allowance for losses on a loan when it becomes impaired as a result of deterioration in credit quality, to the extent there is no longer assurance of timely realization of the carrying value of the loan and related investment income. We reduce the carrying value of an impaired loan to its estimated net realizable value when we establish the allowance. We establish an allowance for losses on reinsurance contracts when a reinsurance counterparty becomes unable or unwilling to fulfill its contractual obligations. We base the allowance for loss on current recoverables and ceded policy liabilities. There is no assurance that the allowance for losses will be adequate to cover future potential losses or that additional allowances or asset write-downs will not be required.

Policy liabilities include general provisions for credit losses from future asset impairments.

Our credit policies, procedures and investment strategies are established under a strong governance framework and are designed to ensure that risks are identified, measured and monitored consistent with our risk appetite. We seek to actively manage credit exposure

in our investment portfolio to reduce risk and minimize losses, and derivative counterparty exposure is managed proactively. However, we could experience volatility on a quarterly basis and losses could potentially rise above long-term expected and historical levels.

Credit Risk Exposure Measures

As at December 31, 2018 and December 31, 2017, for every 50% that credit defaults over the next year exceed the rates provided for in policy liabilities, net income attributed to shareholders would be reduced by $62 million and $63 million in each year, respectively. Credit downgrades for fixed income investments would adversely impact our regulatory capital, as required capital levels for such investments are based on the credit quality of each instrument. In addition, credit downgrades could also be higher than assumed in policy liabilities, resulting in policy liability increases and a reduction in net income attributed to shareholders.

The table below shows net impaired assets and allowances for loan losses.

Net Impaired Assets and Loan Losses

As at December 31, ($ millions, unless otherwise stated)	2018	2017
Net impaired fixed income assets	**$179**	$ 173
Net impaired fixed income assets as a % of total invested assets	**0.051%**	0.052%
Allowance for loan losses	**$95**	$ 85

Product Risk

Product risk is the risk of failure to design, implement and maintain a product or service to achieve expected outcomes and the risk of loss due to actual experience emerging differently than assumed when a product was designed and priced.

Product Risk Management

Product risk is governed by the Product Oversight Committee for the insurance business and by the Global Wealth and Asset Management ("Global WAM") Risk Committee for global WAM business.

Insurance Product Risk Management Strategy

The Product Oversight Committee oversees the overall insurance risk management program. The Product Oversight Committee has established a broad framework for managing insurance risk under a set of policies, standards and guidelines, to ensure that our product offerings align with our risk taking philosophy and risk limits, and achieve acceptable profit margins. These cover:

- product design features
- use of reinsurance
- pricing models and software
- internal risk-based capital allocations
- target profit objectives
- pricing methods and assumption setting
- stochastic and stress scenario testing
- required documentation
- review and approval processes
- experience monitoring programs

In each business unit that sells insurance, we designate individual pricing officers who are accountable for pricing activities, chief underwriters who are accountable for underwriting activities and chief claims risk managers who are accountable for claims activities. Both the pricing officer and the general manager of each business unit approve the design and pricing of each product, including key claims, policyholder behaviour, investment return and expense assumptions, in accordance with global policies and standards. Risk management functions provide additional oversight, review and approval of all product and pricing initiatives, as well as material underwriting initiatives. Actuarial functions provide oversight review and approval of policy liability valuation methods and assumptions. In addition, both risk and actuarial functions review and approve new reinsurance arrangements. We perform annual risk and compliance self-assessments of the product development, pricing, underwriting and claims activities of all insurance businesses. To leverage best practices, we facilitate knowledge transfer between staff working with similar businesses in different geographies.

We utilize a global underwriting manual intended to ensure insurance underwriting practices for direct written life business are consistent across the organization while reflecting local conditions. Each business unit establishes underwriting policies and procedures, including criteria for approval of risks and claims adjudication policies and procedures.

We apply retention limits per insured life that are intended to reduce our exposure to individual large claims which are monitored in each business unit. These retention limits vary by market and jurisdiction. We reinsure exposure in excess of these limits with other companies (see "Risk Factors-Product Risk Factors-External market conditions determine the availability, terms and cost of reinsurance protection", below). Our current global life retention limit is US$30 million for individual policies (US$35 million for survivorship life policies) and is shared across businesses. We apply lower limits in some markets and jurisdictions. We aim to further reduce exposure to claims concentrations by applying geographical aggregate retention limits for certain covers. Enterprise-wide, we aim to reduce the likelihood of high aggregate claims by operating globally, insuring a wide range of unrelated risk events, and reinsuring some risks. We seek to actively manage the Company's aggregate exposure to each of policyholder behaviour risk and claims risk against enterprise-wide economic capital limits. Policyholder behaviour risk limits cover the combined risk arising from policy lapses and surrenders, withdrawals and other policyholder driven activity. The claims risk limits cover the combined risk arising from mortality, longevity and morbidity.

Internal experience studies, as well as trends in our experience and that of the industry, are monitored to update current and projected claims and policyholder behaviour assumptions, resulting in updates to policy liabilities as appropriate.

Global Wealth and Asset Management ("Global WAM") Product Risk Management Strategy
Global WAM product risk is governed by the Global WAM Risk Committee which oversees the overall product risk management program for Global WAM. The Committee has established a broad framework for managing risk under a set of policies, standards and guidelines to ensure that our product offerings align with our risk-taking philosophy and risk limits. The Global WAM product risk governance policy describes the requirements to be complied with for products/solutions with respect to stakeholder review, approval and post-launch monitoring.

Global WAM Risk Management also provides oversight and review of material changes to existing products/solutions on the various Global WAM platforms. Global WAM Risk Management performs annual risk self-assessments of the product/solution activities of all Global WAM businesses.

Operational Risk

Operational risk is the risk of loss resulting from inadequate or failed internal processes, systems failures, human-performance failures or from external events.

Operational Risk Management Strategy
Our corporate governance practices, corporate values, and integrated enterprise-wide approach to managing risk set the foundation for mitigating operational risks. This base is further strengthened by internal controls and systems, compensation programs, and seeking to hire and retain trained and competent people throughout the organization. We align compensation programs with business strategy, long-term shareholder value and good governance practices, and we benchmark these compensation practices against peer companies.

We have an enterprise operational risk management framework that sets out the processes we use to identify, assess, manage, mitigate and report on significant operational risk exposures. Execution of our operational risk management strategy supports the drive towards a focus on the effective management of our key global operational risks. We have an Operational Risk Committee, which is the main decision-making committee for all operational risk matters and which has oversight responsibility for operational risk strategy, management and governance. We have enterprise-wide risk management programs for specific operational risks that could materially impact our ability to do business or impact our reputation.

Legal and Regulatory Risk Management Strategy
Global Compliance oversees our regulatory compliance program and function, supported by designated Chief Compliance Officers in every Segment. The program is designed to promote compliance with regulatory obligations worldwide and to assist in making the Company's employees aware of the laws and regulations that affect it, and the risks associated with failing to comply. Segment compliance groups monitor emerging legal and regulatory issues and changes and prepare us to address new requirements. Global Compliance also independently assesses and monitors the effectiveness of a broad range of regulatory compliance processes and business practices against potential legal, regulatory, fraud and reputation risks, and allows significant issues to be escalated and proactively mitigated. Among these processes and business practices are: privacy (i.e. handling of personal and other confidential information), sales and marketing practices, sales compensation practices, asset management practices, fiduciary responsibilities, employment practices, underwriting and claims processing, product design, and regulatory filings. In addition, we have policies, processes and controls in place to help protect the Company, our customers and other related third parties from acts of fraud and from risks associated with money laundering and terrorist financing. Audit Services, Global Compliance and Segment compliance personnel periodically assess the effectiveness of the control environment. For further discussion of government regulation and legal proceedings, refer to "Government Regulation" in MFC's Annual Information Form dated February 13, 2019 and note 18 of the 2018 Annual Consolidated Financial Statements.

Business Continuity Risk Management Strategy
We have an enterprise-wide business continuity and disaster recovery program. This includes policies, plans and procedures that seek to minimize the impact of natural or man-made disasters, and is designed to ensure that key business functions can continue normal operations in the event of a major disruption. Each business unit is accountable for preparing and maintaining detailed business continuity plans and processes. The global program incorporates periodic scenario analysis designed to validate the assessment of both critical and non-critical units, as well as the establishment and testing of appropriate business continuity plans for all critical functions. The business continuity team establishes and regularly tests crisis management plans and global crisis communications protocols. We maintain off-site backup facilities and failover capability designed to minimize downtime and accelerate system recovery.

Technology & Information Security Risk Management Strategy
Our Technology Risk Management function provides strategy, direction, and oversight and facilitates governance for all technology risk domain activities across the Company. The scope of this function includes: reducing information risk exposures by introducing a robust enterprise information risk management framework and supporting infrastructure for proactively identifying, managing, monitoring and reporting on critical information risk exposures; promoting transparency and informed decision-making by building and maintaining information risk profiles and risk dashboards for Enterprise Technology & Services and Segments aligned with enterprise and operational risk reporting; providing advisory services to Global Technology and the Segments around current and emerging technology risks and their impact to the Company's information risk profile; and reducing vendor information risk exposures by incorporating sound information risk management practices into sourcing, outsourcing and offshoring initiatives and programs.

The enterprise-wide information security program, which is overseen by the Chief Information Risk Officer, seeks to mitigate information security risks. This program establishes the information and cyber security framework for the Company, including governance, policies and standards, and appropriate controls to protect information and computer systems. We also have annual security awareness training sessions for all employees.

Many jurisdictions in which we operate are implementing more stringent privacy legislation. Our global privacy program, overseen by our Chief Privacy Officer, seeks to manage the risk of privacy breaches. It includes policies and standards, ongoing monitoring of emerging privacy legislation, and a network of privacy officers. Processes have been established to provide guidance on handling personal information and for reporting privacy incidents and issues to appropriate management for response and resolution.

In addition, the Chief Information Risk Officer, the Chief Privacy Officer, and their teams work closely on information security and privacy matters.

Human Resource Risk Management Strategy
We have a number of human resource policies, practices and programs in place that seek to manage the risks associated with attracting and retaining top talent. These include recruiting programs at every level of the organization, training and development programs for our individual contributors and people leaders, employee engagement surveys, and competitive compensation programs that are designed to attract, motivate and retain high-performing and high-potential employees.

Model Risk Management Strategy
We have designated model risk management teams working closely with model owners and users that seek to manage model risk. Our model risk oversight program includes processes intended to ensure that our critical business models are conceptually sound and used as intended, and to assess the appropriateness of the calculations and outputs.

Third-Party Risk Management Strategy
Our governance framework to address third-party risk includes appropriate policies (such as our Global Outsourcing and Vendor Risk Management Policy and Global Procurement Policy), standards and procedures, and monitoring of ongoing results and contractual compliance of third-party arrangements.

Project Risk Management Strategy
To seek to ensure that key projects are successfully implemented and monitored by management, we have a Global Project and Program Management Centre of Expertise, which is responsible for establishing policies and standards for project management. Our policies, standards and practices are benchmarked against leading practices.

Capital Management Framework

Manulife 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.

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

We periodically assess the strength of our capital position under various stress scenarios. The annual Dynamic Capital Adequacy Testing ("DCAT") typically quantifies the financial impact of economic events arising from shocks in public equity and other markets, interest rates and credit, amongst others. Our 2018 DCAT results demonstrate that we would have sufficient assets, under the various adverse scenarios tested, to discharge our policy liabilities. This conclusion was also supported by a variety of other stress tests conducted by the Company.

We use an Economic Capital ("EC") framework to inform our internal view of the level of required capital and available capital. The EC framework is a key component of the Own Risk and Solvency Assessment ("ORSA") process, which ties together our risk management, strategic planning and capital management practices to confirm that our capital levels continue to be adequate from an economic perspective.

Capital management is also integrated into our product planning and performance management practices.

The composition of capital between equity and other capital instruments impacts the financial leverage ratio which is an important consideration in determining the Company's financial strength and credit ratings. The Company monitors and rebalances its capital mix through capital issuances and redemptions.

Capital and Funding Activities

During 2018, we raised a total of $0.9 billion of capital in Canada and $0.9 billion of securities matured or were redeemed.

The following table provides our funding activity for the year ended December 31, 2018.

($ millions)	Issued	Redeemed/Matured
Preferred shares[1]	**$ 250**	**$ –**
Subordinated debentures[2],[3]	**600**	**450**
Senior debt[4]	**–**	**400**
Total	**$ 850**	**$ 850**

[1]MFC issued 10 million Non-cumulative 5-Year Rate Reset Class 1 Shares, Series 25 ("Series 25 Shares") for gross proceeds of $250 million on February 20, 2018.
[2]MFC issued $600 million (3.317%) of subordinated debentures on May 9, 2018.
[3]A total of $450 million of MLI subordinated debentures were redeemed at par during the year: $200 million (2.819%) on February 26, 2018 and $250 million (2.926%) on November 29, 2018.
[4]$400 million MFC medium term notes (5.505%) matured on June 26, 2018.

Normal Course Issuer Bid

On November 12, 2018, MFC announced that the Toronto Stock Exchange ("TSX") approved a normal course issuer bid ("NCIB") permitting the purchase by MFC for cancellation of up to 40 million MFC common shares. Pursuant to the Notice of Intention filed with the TSX, 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 MFC completes its purchases. During 2018, MFC purchased and subsequently cancelled 23 million of its common shares pursuant to the NCIB at an average price of $20.66 per common share for a total cost of $478 million.

The following measure of capital reflects our capital management activities at the MFC level.

As at December 31, ($ millions)	2018	2017	2016
Non-controlling interests	**$ 1,093**	$ 929	$ 743
Participating policyholders' equity	**94**	221	248
Preferred shares	**3,822**	3,577	3,577
Common shareholders' equity(1)	**42,142**	37,436	38,255
Total equity	**47,151**	42,163	42,823
Adjusted for accumulated other comprehensive loss on cash flow hedges	**(127)**	(109)	(232)
Total equity excluding accumulated other comprehensive loss on cash flow hedges	**47,278**	42,272	43,055
Qualifying capital instruments	**8,732**	8,387	7,180
Consolidated capital	**$ 56,010**	$ 50,659	$ 50,235

(1)Common shareholders' equity is equal to total shareholders' equity less preferred shares.

The "Consolidated capital" referred to in the table above does not include $4.8 billion (2017 – $4.8 billion, 2016 – $5.7 billion) of senior debt issued by MFC because this form of financing does not meet OSFI's definition of regulatory capital at the MFC level. The Company has down-streamed the proceeds from this financing into operating entities in a form that qualifies as regulatory capital at the subsidiary level. For regulatory purposes, LICAT available capital is based on the above consolidated capital with adjustments for certain deductions, limits and restrictions, as mandated by the LICAT guideline.

Consolidated capital was $56.0 billion as at December 31, 2018 compared with $50.7 billion as at December 31, 2017, an increase of approximately $5.3 billion. The increase from December 31, 2017 was primarily driven by net income attributed to shareholders net of dividends paid of $2.9 billion, net capital issuances of approximately $100 million consisting of net subordinated debt and preferred shares issuances less the net impact of share buybacks and issuance of shares for the dividend reinvestment program (as senior debt is not included in the definition of capital, the $400 million of senior debt redeemed in 2018 did not impact the change in capital), and the net increase in AOCI. The net increase in AOCI was due to a weaker Canadian dollar compared to the U.S. dollar, partially offset by the impact of higher interest rates and lower equity markets on assets classified as AFS.

Remittability of Capital

As part of its capital management, Manulife promotes internal capital mobility so that Manulife's parent company, MFC, has access to funds to meet its obligations and to optimize the use of excess capital. Cash remittance is defined as the cash remitted or payable to the Group from operating subsidiaries and excess capital generated by stand-alone Canadian operations. It is one of the key metrics used by management to evaluate our financial flexibility. In 2018, MFC subsidiaries delivered $4.0 billion in remittances compared with $2.1 billion in 2017.

Financial Leverage Ratio

MFC's financial leverage ratio decreased to 28.6% as at December 31, 2018 from 30.3% as at December 31, 2017, driven by the increase of $5.0 billion in equity, supported by earnings and the impact of a weaker Canadian dollar compared with the U.S. dollar.

Common Shareholder Dividends

The declaration and payment of shareholder dividends and the amount thereof are at the discretion of the Board of Directors and depend upon various factors, including the results of operations, financial condition and future prospects of the Company and taking into account regulatory restrictions on the payment of shareholder dividends, as well as any other factors deemed relevant by the Board of Directors.

Common Shareholder Dividends Paid

For the years ended December 31, $ per share	2018	2017	2016
Dividends paid	**$ 0.910**	$ 0.820	$ 0.740

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.

In 2016, 2017 and for the first three quarters of 2018, common shares in connection with the 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. In 2018, we issued 9.3 million common shares from treasury for a total consideration of $178 million under this program.

Regulatory Capital Position[1]

MFC and MLI are regulated by OSFI and are subject to consolidated risk-based capital requirements. Manulife monitors and manages its consolidated capital in compliance with the applicable OSFI guideline. The LICAT framework replaced the Minimum Continuing

[1] The "Risk Factors" section of the MD&A outlines a number of regulatory capital risks.

Capital and Surplus Requirements ("MCCSR") framework on January 1, 2018. Under both guidelines our consolidated available capital was/is measured against a required amount of risk capital determined in accordance with the guideline; however, as a result of the major changes, the LICAT total ratios and MCCSR ratios are not directly comparable.

Manulife's operating activities are mostly conducted within MLI and its subsidiaries. MLI's LICAT total ratio was 143% as at December 31, 2018, compared with 129% as at March 31, 2018 (there are no prior year comparatives as LICAT, OSFI's new capital regime, became effective in 2018). The 14% percentage point improvement from March 31, 2018 was primarily driven by actions to release capital in our North American legacy businesses, growth in retained earnings, and the favourable impact of the wider corporate spreads partially offset by the impact of lower equity markets.

MFC's LICAT total ratio was 132% as at December 31, 2018 compared with 117% as at March 31, 2018. The differences between the MLI and MFC ratios were largely due to the $4.8 billion of MFC senior debt outstanding that, under OSFI rules, does not qualify as available capital at the MFC level.

The new LICAT framework did not materially change the level of excess capital held by Manulife. The LICAT total ratios as at December 31, 2018 resulted in excess capital of $23.3 billion over OSFI's supervisory target ratio of 100% for MLI, and $22.8 billion over OSFI's regulatory minimum target ratio of 90% for MFC (no supervisory target is applicable to MFC). As at December 31, 2018, all MLI's subsidiaries maintained capital levels in excess of local requirements.

Credit Ratings

Manulife's operating companies have strong financial strength ratings from credit rating agencies. Maintaining strong ratings on debt and capital instruments issued by MFC and its subsidiaries allows us to access capital markets at competitive pricing levels. Ratings are important factors in establishing the competitive position of insurance companies and maintaining public confidence in products being offered. Should these credit ratings decrease materially, our cost of financing may increase and our access to funding and capital through capital markets could be reduced.

During 2018, S&P, Moody's, DBRS, Fitch and A.M. Best maintained their assigned ratings of MFC and its primary insurance operating companies.

The following table summarizes the financial strength and claims paying ability ratings of MLI and certain of its subsidiaries as at February 1, 2019.

Financial Strength Ratings

	S&P	Moody's	DBRS	Fitch	A.M. Best
The Manufacturers Life Insurance Company	**AA-**	**A1**	**AA(Low)**	**AA-**	**A+ (Superior)**
John Hancock Life Insurance Company (U.S.A.)	**AA-**	**A1**	**Not Rated**	**AA-**	**A+ (Superior)**
Manulife (International) Limited	**AA-**	**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
Manulife Life Insurance Company	**A+**	**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**
Manulife (Singapore) Pte. Ltd.	**AA-**	**Not Rated**	**Not Rated**	**Not Rated**	**Not Rated**

As at February 1, 2019, S&P, Moody's, DBRS, Fitch, and A.M. Best had a stable outlook on these ratings.

Critical Actuarial and Accounting Policies

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 the Consolidated Financial Statements are described in note 1 to the 2018 Annual Consolidated Financial Statements.

Policy Liabilities (Insurance and Investment Contract Liabilities)

Policy liabilities for IFRS are valued in Canada under standards established by the Actuarial Standards Board. These standards are designed to ensure we establish an appropriate liability on the Consolidated Statements of Financial Position to cover future obligations to all our policyholders. The assumptions underlying the valuation of policy liabilities are required to be reviewed and updated on an ongoing basis to reflect recent and emerging trends in experience and changes in risk profile of the business. In conjunction with prudent business practices to manage both product and asset related risks, the selection and monitoring of appropriate valuation assumptions is designed to minimize our exposure to measurement uncertainty related to policy liabilities.

Policy liabilities have two major components: a best estimate amount and a provision for adverse deviation. The best estimate amount represents the estimated value of future policyholder benefits and settlement obligations to be paid over the term remaining on in-force policies, including the costs of servicing the policies. The best estimate amount is reduced by the future expected policy revenues and future expected investment income on assets supporting the policies, before any consideration for reinsurance ceded. To determine the best estimate amount, assumptions must be made for a number of key factors, including future mortality and morbidity rates, investment returns, rates of policy termination and premium persistency, operating expenses, certain taxes (other than income taxes and includes temporary tax timing and permanent tax rate differences on the cash flows available to satisfy policy obligations) and foreign currency. Reinsurance is used to transfer part or all of a policy liability to another insurance company at terms negotiated with that insurance company. A separate asset for reinsurance ceded is calculated based on the terms of the reinsurance treaties that are in-force, with deductions taken for the credit standing of the reinsurance counterparties where appropriate.

To recognize the uncertainty involved in determining the best estimate actuarial liability assumptions, a provision for adverse deviation (“PfAD”) is established. The PfAD is determined by including a margin of conservatism for each assumption to allow for possible mis-estimation of, or deterioration in, future experience in order to provide greater comfort that the policy liabilities will be sufficient to pay future benefits. The CIA establishes suggested ranges for the level of margins for adverse deviation based on the risk profile of the business. Our margins are set taking into account the risk profile of our business. The effect of these margins is to increase policy liabilities over the best estimate assumptions. The margins for adverse deviation decrease the income that is recognized at the time a new policy is sold and increase the income recognized in later periods as the margins release as the remaining policy risks reduce.

Best Estimate Assumptions

We follow established processes to determine the assumptions used in the valuation of our policy liabilities. The nature of each risk factor and the process for setting the assumptions used in the valuation are discussed below.

Mortality

Mortality relates to the occurrence of death. Mortality assumptions are based on our internal as well as industry past and emerging experience and are differentiated by sex, underwriting class, policy type and geographic market. We make assumptions about future mortality improvements using historical experience derived from population data. Reinsurance is used to offset some of our direct mortality exposure on in-force life insurance policies with the impact of the reinsurance directly reflected in our policy valuation for the determination of policy liabilities net of reinsurance. Actual mortality experience is monitored against these assumptions separately for each business. The results are favourable where mortality rates are lower than assumed for life insurance and where mortality rates are higher than assumed for payout annuities. Overall 2018 experience was favourable (2017 – unfavourable) when compared with our assumptions.

Morbidity

Morbidity relates to the occurrence of accidents and sickness for the insured risks. Morbidity assumptions are based on our internal as well as industry past and emerging experience and are established for each type of morbidity risk and geographic market. For our JH Long Term Care business we make assumptions about future morbidity changes. Actual morbidity experience is monitored against these assumptions separately for each business. Our morbidity risk exposure relates to future expected claims costs for long-term care insurance, as well as for group benefits and certain individual health insurance products we offer. Overall 2018 experience was unfavourable (2017 – unfavourable) when compared with our assumptions.

Policy Termination and Premium Persistency
Policy termination includes lapses and surrenders, where lapses represent the termination of policies due tonon-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 our recent experience adjusted for expected future conditions. Assumptions reflect differences by type of contract within each geographic market and actual experience is monitored against these assumptions separately for each business. Overall 2018 experience was unfavourable (2017 – unfavourable) when compared with our assumptions.

Expenses and Taxes
Operating expense assumptions reflect the projected costs of maintaining and servicingin-force policies, including associated overhead expenses. The expenses are derived from internal cost studies and are 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 mature. Actual expenses are monitored against assumptions separately for each business. Overall maintenance expenses for 2018 were unfavourable (2017 – unfavourable) when compared with our assumptions. 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.

Investment Returns
As noted in the “Risk Management – Market Risk – Asset Liability Management Strategy” section above, our general fund product liabilities are categorized into groups with similar characteristics in order to support them with a specific asset strategy. We seek to align the asset strategy for each group to the premium and benefit pattern, policyholder options and guarantees, and crediting rate strategies of the products they support. The projected cash flows from the assets are combined with projected cash flows from future asset purchases/sales to determine expected rates of return for future years. The investment strategies for future asset purchases and sales are based on our target investment policies for each segment and the reinvestment returns are derived from current and projected market rates for fixed interest investments and our projected outlook for non-fixed interest assets. Credit losses are projected based on our own and industry experience, as well as specific reviews of the current investment portfolio. Investment return assumptions for each asset class also incorporate expected investment management expenses that are derived from internal cost studies. In 2018, actual investment returns were favourable (2017 – favourable) when compared with our assumptions. Investment-related experience and the direct impact of interest rates and equity markets are discussed in the “Financial Performance” section above.

Segregated Funds
We offer segregated funds to policyholders that offer certain guarantees, including guaranteed returns of principal on maturity or death, as well as guarantees of minimum withdrawal amounts or income benefits. The on-balance sheet liability for these benefits is the expected cost of these guarantees including appropriate valuation margins for the various contingencies including mortality and lapse. The dominant driver of the cost of guarantees is the return on the underlying funds in which the policyholders invest. See “Risk Management – Market Risk – Hedging Strategies for Variable Annuity and Other Equity Risks” and the “Financial Performance – Analysis of Net Income” sections above.

Foreign Currency
Foreign currency risk results from a mismatch of the currency of the policy liabilities and the currency of the assets designated to support these obligations. We generally match the currency of our assets with the currency of the liabilities they support, with the objective of mitigating the risk of economic loss arising from movements in currency exchange rates. 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 exchange rates.

Experience Adjusted Products
Where policies have features that allow the impact of changes in experience to be passed on to policyholders through policy dividends, experience rating refunds, credited rates or other adjustable features, the projected policyholder benefits are adjusted to reflect the projected experience. Minimum contractual guarantees and other market considerations are taken into account in determining the policy adjustments.

Provision for Adverse Deviation
The total provision for adverse deviation is the sum of the provisions for adverse deviation for each risk factor. Margins for adverse deviation are established by product type and geographic market for each assumption or factor used in the determination of the best estimate actuarial liability. The margins are established based on the risk characteristics of the business being valued.

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 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.

In addition to the explicit margin for adverse deviation, the valuation basis for segregated fund liabilities explicitly limits the future revenue recognition in the valuation basis to the amount necessary to offset acquisition expenses, after allowing for the cost of any guarantee features. The fees that are in excess of this limitation are reported as an additional margin and are shown in segregated fund non-capitalized margins.

The provision for adverse deviation and the future revenue deferred in the valuation due to the limitations on recognition of future revenue in the valuation of segregated fund liabilities are shown in the table below.

As at December 31, ($ millions)	2018	2017
Best estimate actuarial liability	**$ 226,128**	$ 219,347
Provision for adverse deviation ("PfAD")		
Insurance risks (mortality/morbidity)	**$ 19,021**	$ 19,258
Policyholder behaviour (lapse/surrender/premium persistency)	**5,776**	5,332
Expenses	**1,573**	1,519
Investment risks (non-credit)	**25,955**	22,979
Investment risks (credit)	**941**	1,024
Segregated funds guarantees	**2,184**	2,282
Total PfAD[1]	**55,450**	52,394
Segregated funds – additional margins	**13,097**	14,464
Total of PfAD and additional segregated fund margins	**$ 68,547**	$ 66,858

(1) Reported net actuarial liabilities (excluding the $5,514 million (2017 – $5,300 million) reinsurance asset related to the Company's in-force participating life insurance closed block that is retained on a funds withheld basis as part of the New York Life transaction) as at December 31, 2018 of $281,578 million (2017 – $271,741 million) are comprised of $226,128 million (2017 – $219,347 million) of best estimate actuarial liabilities and $55,450 million (2017 – $52,394 million) of PfAD.

The change in the PfAD from period to period is impacted by changes in liability and asset composition, by currency and interest rate movements and by material changes in valuation assumptions. The overall decrease in PfADs for insurance risks was primarily due to the impact of higher interest rates in the U.S., as well as the impact from reinsurance on our North American legacy businesses, partially offset by the impact of changes in currency rates (the depreciation of the Canadian dollar against the U.S. dollar, Hong Kong dollar and Japanese yen) and by the expected PfAD growth from in-force and new business. The overall increase in PfADs for policyholder behaviour was driven by currency and by the expected PfAD growth from in-force and new business. The overall increase in PfADs for non-credit investment risks was driven by currency, the expected PfAD growth from in-force and new business, and by the annual review of actuarial valuation methods and assumptions, partially offset by the impact from normal rebalancing as part of our interest rate hedging program and the impact of higher interest rates in the U.S. The increase in the additional segregated fund margins was primarily due to decreases in equity markets and increases in interest rates in the U.S.

Sensitivity of Earnings to Changes in Assumptions

When the assumptions underlying our determination of policy liabilities are updated to reflect recent and emerging experience or change in outlook, the result is a change in the value of policy liabilities which in turn affects net income attributed to shareholders. The sensitivity of net income attributed to shareholders to changes in non-economic and certain asset related assumptions underlying policy liabilities is shown below and assumes that there is a simultaneous change in the assumptions across all business units. The sensitivity of net income attributed to shareholders to a deterioration or improvement in non-economic assumptions underlying long-term care policy liabilities as at December 31, 2018 is also shown below.

For changes in asset related assumptions, the sensitivity is shown net of the corresponding impact on income of the change in the value of the assets supporting liabilities. 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, actual experience differing from the assumptions, changes in business mix, effective tax rates and other market factors, and the general limitations of our internal models.

Potential impact on net income attributed to shareholders arising from changes tonon-economic assumptions[1]

As at December 31, ($ millions)	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 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 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, we 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 tonon-economic assumptions for Long Term Care[1]

As at December 31, 2018 ($ millions)	Decrease in net income attributed to shareholders
Policy related assumptions	
2% change in future mortality rates[2],[3]	**$ (200)**
5% change in future morbidity incidence rates[2],[3]	**(1,700)**
5% change in future morbidity claims termination rates[2],[3]	**(2,800)**
10% change in future policy termination rates[2],[3]	**(400)**
5% increase in future expense levels[3]	**(100)**

(1) Translated from US$ at 1.3642 for 2018.
(2) The impacts of the 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, we would plan to file for rate increases equal to the amount of deterioration resulting from the sensitivity.
(3) The impact of favourable changes to all the sensitivities is relatively symmetrical.

Potential impact on net income attributed to shareholders arising from changes to asset related assumptions supporting actuarial liabilities[1]

As at December 31, ($ millions)	Increase (decrease) in net income attributed to shareholders			
	2018		2017	
	Increase	Decrease	Increase	Decrease
Asset related assumptions updated periodically in valuation basis changes				
100 basis point change in future annual returns for public equities[2]	**$ 500**	**$ (500)**	$ 400	$ (400)
100 basis point change in future annual returns for ALDA[3]	**3,500**	**(3,900)**	3,600	(4,100)
100 basis point change in equity volatility assumption for stochastic segregated fund modelling	**(300)**	**300**	(200)	200

(1) The sensitivity to public equity returns above includes the impact on both segregated fund guarantee reserves and on other policy liabilities. Expected long-term annual market growth assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. As at December 31, 2018, the growth rates inclusive of dividends in the major markets used in the stochastic valuation models for valuing segregated fund guarantees are 9.3% (9.3% – December 31, 2017) per annum in Canada, 9.6% (9.6% – December 31, 2017) per annum in the U.S. and 6.2% (6.2% – December 31, 2017) per annum in Japan. Growth assumptions for European equity funds are market-specific and vary between 8.3% and 9.9%.
(2) ALDA include commercial real estate, timber, farmland, direct oil and gas properties, and private equities, some of which relate to oil and gas. Expected long-term return assumptions for ALDA and public equity are set in accordance with the Standards of Practice for the valuation of insurance contract liabilities and guidance published by the CIA. Annual best estimate return assumptions for ALDA and public equity include market growth rates and annual income, such as rent, production proceeds and dividends, and will vary based on our holding period. Over a 20-year horizon, our best estimate return assumptions range between 5.25% and 11.65%, with an average of 9.5% based on the current asset mix backing our guaranteed insurance and annuity business as of December 31, 2018 (9.5% – December 31, 2017), adjusted to reflect our decision to reduce the allocation to ALDA in the portfolio asset mix supporting our North American legacy businesses as of December 31, 2018. Our return assumptions including the margins for adverse deviations in our valuation, which take into account the uncertainty of achieving the returns, range between 2.5% and 7.5%, with an average of 6.3% based on the asset mix backing our guaranteed insurance and annuity business as of December 31, 2018 (6.3% – December 31, 2017), adjusted to reflect our decision to reduce the allocation to ALDA in the portfolio asset mix supporting our North American legacy businesses.
(3) Volatility assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. The resulting volatility assumptions are 16.95% per annum in Canada and 17.15% per annum in the U.S. for large cap public equities, and 19.25% per annum in Japan. For European equity funds, the volatility varies between 16.5% and 18.4%.

Review of Actuarial Methods and Assumptions

A comprehensive review of actuarial methods and assumptions is performed annually. The review is designed to reduce the Company's exposure to uncertainty by ensuring assumptions for both asset related and liability related risks remain appropriate. This is accomplished by monitoring experience and selecting assumptions which represent a current best estimate view of expected 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 changes in the economic environment are likely to result in future changes to the actuarial assumptions, which could be material.

2018 Review of Actuarial Methods and Assumptions

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

For the year ended December 31, 2018 ($ millions)	Change in insurance contract liabilities, net of reinsurance			Change in net income attributed to shareholders
	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	
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 million 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 its U.S. 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 million 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. life insurance product lines ($252 million post-tax charge). This included updates to universal life no-lapse guarantee and 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 million post-tax gain to net income attributed to shareholders. We updated our bond default rates to reflect recent experience, leading to a $401 million post-tax gain and updated our investment return assumptions for ALDA and public equities, specifically oil and gas, which led to a $210 million post-tax charge. Other refinements to the projections of investment returns resulted in a $48 million post-tax charge.

Other updates

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

Impact of changes in actuarial methods and assumptions by segment

The impact of changes in actuarial methods and assumptions in Canada was a post-tax charge to net income attributed to shareholders of $370 million. This charge was driven by updates to oil & gas investment return assumptions and updates to mortality and morbidity assumptions for our structured settlement and term renewal businesses. In the U.S., we recorded a post-tax gain of $286 million, driven by updates to our bond default rates and refinements to the projection of our tax and liability cashflows, partially offset by updates to policyholder behaviour assumptions in JH Life. Updates to assumptions in Asia and Reinsurance resulted in a post-tax gain of $33 million.

2017 Review of Actuarial Methods and Assumptions

The 2017 full year review of actuarial methods and assumptions resulted in an increase in insurance and investment contract liabilities of $277 million, net of reinsurance, and a decrease in net income attributed to shareholders of $35 million. These charges exclude the impacts of U.S. Tax Reform and the decision to reduce the allocation to ALDA in the portfolio asset mix supporting our North American legacy businesses. These two items resulted in a post-tax increase in policy liabilities and total charge to net income attributed to shareholders in 4Q17 of $2.8 billion.

For the year ended December 31, 2017 ($ millions)	Change in insurance contract liabilities, net of reinsurance			Change in net income attributed to shareholders
	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	
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 million benefit to net income attributed to shareholders.

We completed a detailed review of the mortality assumptions for our U.S. life insurance business which resulted in a $384 million charge to net income attributed to shareholders. We increased assumptions particularly at older ages, reflecting both industry and our own experience.

Updates to actuarial standards related to future mortality improvement, and the review of mortality improvement assumptions globally, resulted in a $264 million 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.

We completed a detailed review of the mortality assumptions for our Canadian retail insurance business which resulted in a $222 million benefit to net income attributed to shareholders.

Other updates to mortality and morbidity assumptions led to a $197 million benefit to net income attributed to shareholders. These updates included a reduction in the margins for adverse deviation applied to our 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 million 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 million 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 million charge to net income attributed to shareholders.

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

Other updates

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

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

Refinements to the projection of our liability and tax cash flows in the U.S. resulted in a $696 million 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 million 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 our asset and liability cash flows.

Impact of changes in actuarial methods and assumptions by segment
The impact of changes in actuarial methods and assumptions in Asia, Canada, the U.S., and Corporate and Other was a post-tax gain/(charge) to net income attributed to shareholders of $166 million, $36 million, $(245) million, and $8 million, respectively.

Change in net insurance contract liabilities

The change in net insurance contract liabilities can be attributed to several sources: new business, acquisitions, in-force movement and currency impact. Changes in net insurance contract liabilities are substantially offset in the financial statements by premiums, investment income, policy benefits and other policy related cash flows. The changes in net insurance contract liabilities by business segment are shown below:

2018 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2018 ($ millions)	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	**$ 62,243**	**$ 76,198**	**$ 135,851**	**$ (46)**	**$ 274,246**
New business[1],[2]	**3,400**	**(100)**	**(31)**	**–**	**3,269**
In-force movement[1],[3]	**5,117**	**344**	**(2,330)**	**(102)**	**3,029**
Changes in methods and assumptions[1]	**52**	**178**	**(397)**	**(7)**	**(174)**
Reinsurance transactions[1]	**–**	**–**	**(11,156)**	**–**	**(11,156)**
Currency impact[4]	**5,315**	**8**	**11,205**	**(13)**	**16,515**
Balance, December 31	**$ 76,127**	**$ 76,628**	**$ 133,142**	**$ (168)**	**$ 285,729**

(1) The $6,826 million increase reported as the change in insurance contract liabilities and change in reinsurance assets on the 2018 Consolidated Statements of Income primarily consists of changes due to the reinsurance transactions and changes in methods and assumptions, partially offset by normal in-force movement and new policies. These 4 items net to a decrease of $5,032 million, of which $6,017 million is included in the income statement increase in insurance contract liabilities and change in reinsurance assets, and a $985 million increase is included in net claims and benefits. The Consolidated Statements of Income change in insurance contract liabilities also includes the change in embedded derivatives associated with insurance contracts. Of the $6,708 million net increase in insurance contract liabilities related to new business and in-force movement, $5,723 million was an increase in actuarial liabilities. The remaining amount was an increase of $985 million in other insurance contract liabilities.
(2) New business policy liability impact is positive/(negative) when estimated future premiums, together with future investment income, are expected to be more/(less) than sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (excluding income taxes) and expenses on new policies issued.
(3) The net in-force movement over the year was an increase of $3,029 million, reflecting expected growth in insurance contract liabilities in all three insurance segments. Expected growth in insurance contract liabilities in the U.S. was offset by the impact of market and yield curve movements during the year.
(4) The increase in policy liabilities from currency impact reflects the depreciation of the Canadian dollar relative to the U.S. dollar, Hong Kong dollar and Japanese yen. To the extent assets are currency matched to liabilities, the increase in insurance contract liabilities due to currency impact is offset by a corresponding increase from currency impact in the value of assets supporting those liabilities.

2017 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2017 ($ millions)	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	$ 54,567	$ 73,384	$ 135,192	$ (590)	$ 262,553
New business[1],[2]	2,130	139	1,276	–	3,545
In-force movement[1],[3]	8,255	2,304	5,329	234	16,122
Changes in methods and assumptions[1]	(21)	(91)	119	270	277
Impact of U.S. Tax Reform[4]	–	–	2,246	–	2,246
Increase due to decision to change portfolio asset mix supporting our legacy businesses[5]	–	468	872	–	1,340
Currency impact[6]	(2,688)	(6)	(9,183)	40	(11,837)
Balance, December 31	$ 62,243	$ 76,198	$ 135,851	$ (46)	$ 274,246

(1) The $22,292 million increase reported as the change in insurance contract liabilities and change in reinsurance assets on the 2017 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 portfolio asset mix supporting our North American legacy businesses. These 5 items net to an increase of $23,530 million, of which $22,628 million is included in the income statement increase in insurance contract liabilities and change in reinsurance assets, and $902 million is included in net claims and benefits. The Consolidated Statements of Income change in insurance contract liabilities also includes the change in embedded derivatives associated with insurance contracts. Of the $19,667 million net increase in insurance contract liabilities related to new business and in-force movement, $18,737 million was an increase in actuarial liabilities. The remaining amount was an increase of $930 million in other insurance contract liabilities.
(2) New business policy liability impact is positive/(negative) when estimated future premiums, together with future investment income, are expected to be more/(less) than sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (excluding income taxes) and expenses on new policies issued.
(3) The net in-force movement over the year was an increase of $16,122 million, reflecting expected growth in insurance contract liabilities in all three segments.
(4) 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 million pre-tax ($1,774 million 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.
(5) The decision to reduce the allocation to ALDA in the portfolio asset mix supporting our 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.
(6) The decrease in policy liabilities from currency impact reflects the appreciation of the Canadian dollar relative to the U.S. dollar, Hong Kong dollar and Japanese yen. To the extent assets are currency matched to liabilities, the increase in insurance contract liabilities due to currency impact is offset by a corresponding increase from currency impact in the value of assets supporting those liabilities.

Critical Accounting Policies

Consolidation

The Company is required to consolidate the financial position and results of entities it controls. Control exists when the Company:

- Has the power to govern the financial and operating policies of the entity;
- Is exposed to a significant portion of the entity's variable returns; and
- Is able to use its power to influence variable returns from the entity.

The Company uses the same principles to assess control over any entity it is involved with. In evaluating control, potential factors assessed include the effects of:

- Substantive potential voting rights that are currently exercisable or convertible;
- Contractual management relationships with the entity;
- Rights and obligations resulting from policyholders to manage investments on their behalf; and
- The effect of any legal or contractual restraints on the Company from using its power to affect its variable returns from the entity.

An assessment of control is based on arrangements in place and the assessed risk exposures at inception. Initial evaluations are reconsidered at a later date if:

- The Company acquires additional interests in the entity or its interests in an entity are diluted;
- The contractual arrangements of the entity are amended such that the Company's involvement with the entity changes; or
- The Company's ability to use its power to affect its variable returns from the entity changes.

Subsidiaries are consolidated from the date on which control is obtained by the Company and cease to be consolidated from the date that control ceases.

Fair Value of Invested Assets

A large portion of the Company's invested assets are recorded at fair value. Refer to note 1 of the 2018 Annual Consolidated Financial Statements for a description of the methods used in determining fair values. When quoted prices in active markets are not available for a particular investment, significant judgment is required to determine an estimated fair value based on market standard valuation methodologies including discounted cash flow methodologies, matrix pricing, consensus pricing services, or other similar techniques. The inputs to these market standard valuation methodologies include: current interest rates or yields for similar instruments, credit rating of the issuer or counterparty, industry sector of the issuer, coupon rate, call provisions, sinking fund requirements, tenor (or expected tenor) of the instrument, management's assumptions regarding liquidity, volatilities and estimated future cash flows. Accordingly, the estimated fair values are based on available market information and management's judgments about the key market factors impacting these financial instruments. Financial markets are susceptible to severe events evidenced by rapid depreciation in asset values accompanied by a reduction in asset liquidity. The Company's ability to sell assets, or the price ultimately realized for these assets, depends upon the demand and liquidity in the market and increases the use of judgment in determining the estimated fair value of certain assets.

Evaluation of Invested Asset Impairment

AFS fixed income and equity securities are carried at fair market value, with changes in fair value recorded in other comprehensive income ("OCI") with the exception of unrealized gains and losses on foreign currency translation of AFS fixed income securities which are included in net income attributed to shareholders. Securities are reviewed on a regular basis and any fair value decrement is transferred out of accumulated other comprehensive income ("AOCI") and recorded in net income attributed to shareholders when it is deemed probable that the Company will not be able to collect all amounts due according to the contractual terms of a fixed income security or when fair value of an equity security has declined significantly below cost or for a prolonged period of time.

Provisions for impairments of mortgage loans and private placement loans are recorded with losses reported in earnings when there is no longer reasonable assurance as to the timely collection of the full amount of the principal and interest.

Significant judgment is required in assessing whether an impairment has occurred and in assessing fair values and recoverable values. Key matters considered include economic factors, Company and industry specific developments, and specific issues with respect to single issuers and borrowers.

Changes in circumstances may cause future assessments of asset impairment to be materially different from current assessments, which could require additional provisions for impairment. Additional information on the process and methodology for determining the allowance for credit losses is included in the discussion of credit risk in note 9 to the 2018 Consolidated Financial Statements.

Derivative Financial Instruments

The Company uses derivative financial instruments ("derivatives") including swaps, forwards and futures agreements, and options to help manage current and anticipated exposures to changes in interest rates, foreign exchange rates, commodity prices and equity market prices, and to replicate permissible investments. Refer to note 4 to the 2018 Consolidated Financial Statements for a description of the methods used to determine the fair value of derivatives.

The accounting for derivatives is complex and interpretations of the primary accounting guidance continue to evolve in practice. Judgment is applied in determining the availability and application of hedge accounting designations and the appropriate accounting treatment under such accounting guidance. Differences in judgment as to the availability and application of hedge accounting

designations and the appropriate accounting treatment may result in a differing impact on the Consolidated Financial Statements of the Company from that previously reported. Assessments of hedge effectiveness and measurements of ineffectiveness of hedging relationships are also subject to interpretations and estimations. If it was determined that hedge accounting designations were not appropriately applied, reported net income attributed to shareholders could be materially affected.

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. The largest defined benefit pension and retiree welfare plans in the U.S. and Canada are the material plans that are discussed herein and in note 16 to the 2018 AnnualConsolidated Financial Statements.

Due to the long-term nature of defined benefit pension and retiree welfare plans, the calculation of the defined benefit obligation and net benefit cost depends on various assumptions such as discount rates, salary increase rates, cash balance interest crediting rates, health care cost trend rates and rates of mortality. These assumptions are determined by management and are reviewed annually. The key assumptions, as well as the sensitivity of the defined benefit obligation to changes in these assumptions, are presented in note 16 to the 2018 Annual Consolidated Financial Statements.

Changes in assumptions and differences between actual and expected experience give rise to actuarial gains and losses that affect the amount of the defined benefit obligation and OCI. For 2018, the amount recorded in OCI was a loss of $109 million (2017 – gain of $83 million) for the defined benefit pension plans and a gain of $48 million (2017 – loss of $2 million) for the retiree welfare plans.

Contributions to the registered (tax qualified) defined benefit pension plans are made in accordance with the applicable U.S. and Canadian regulations. During 2018, the Company contributed $23 million (2017 – $26 million) to these plans. As at December 31, 2018, the difference between the fair value of assets and the defined benefit obligation for these plans was a surplus of $257 million (2017 – surplus of $383 million). For 2019, the contributions to the plans are expected to be approximately $12 million.

The Company's supplemental pension plans for executives are not funded; benefits under these plans are paid as they become due. During 2018, the Company paid benefits of $56 million (2017 – $59 million) under these plans. As at December 31, 2018, the defined benefit obligation for these plans, which is reflected as a liability in the balance sheet, amounted to $742 million (2017 – $761 million).

The Company's retiree welfare plans are partially funded, although there are no regulations or laws governing or requiring the funding of these plans. As at December 31, 2018, the difference between the fair value of plan assets and the defined benefit obligation for these plans was a deficit of $30 million (2017 – deficit of $78 million).

Income Taxes

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 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 period. A deferred tax asset or liability results from temporary differences between carrying values of the assets and liabilities and their respective tax basis. Deferred tax assets and liabilities are recorded based on expected future tax rates and management's assumptions regarding the expected timing of the reversal of such temporary differences. The realization of deferred tax assets depends upon the existence of sufficient taxable income within the carryback or carry forward periods under the tax law in the applicable tax jurisdiction. 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. At December 31, 2018, we had $4,318 million of deferred tax assets (December 31, 2017 – $4,569 million). Factors in management's determination include, among other things, the following:

- Future taxable income exclusive of reversing temporary differences and carry forwards;
- Future reversals of existing taxable temporary differences;
- Taxable income in prior carryback years; and
- Tax planning strategies.

The Company may be required to change its provision for income taxes if the ultimate deductibility of certain items is successfully challenged by taxing authorities or if estimates used in determining the amount of deferred tax assets to recognize change significantly, or when receipt of new information indicates the need for adjustment in the recognition of deferred tax assets. 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 tax, deferred tax balances, actuarial liabilities (see Critical Actuarial and Accounting Policies – Expenses and Taxes above) and the effective tax rate. Any such changes could significantly affect the amounts reported in the Consolidated Financial Statements in the year these changes occur.

Goodwill and Intangible Assets

At December 31, 2018, under IFRS we had $5,864 million of goodwill and $4,233 million of intangible assets ($1,617 million of which are intangible assets with indefinite lives). Goodwill and intangible assets with indefinite lives are tested at the cash generating unit level ("CGU") or group of CGUs level. A CGU comprises the smallest group of assets that are capable of generating largely independent cash flows and is either a business segment or a level below. The tests performed in 2018 demonstrated that there was

no impairment of goodwill or intangible assets with indefinite lives. 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.

Impairment charges could occur in the future as a result of changes in economic conditions. The goodwill testing for 2019 will be updated based on the conditions that exist in 2019 and may result in impairment charges, which could be material.

Future Accounting and Reporting Changes

There are a number of new accounting and reporting changes issued under IFRS including those still under development by the International Accounting Standards Board ("IASB") that will impact the Company beginning in 2019. Summaries of each of the most recently issued key accounting standards are presented below.

(a) Changes effective in 2018

(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 the 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 whose predominant activities are connected with 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. We 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.

(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) IFRS Interpretation Committee ("IFRIC") Interpretation 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) Accounting and reporting changes issued with an effective date later than 2018

(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 below. 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 customer ("lessee") and the supplier ("lessor"). 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 the 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) 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 when a plan amendment, curtailment or settlement 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 business and provide a simplified assessment of whether an acquired set of activities and assets qualifies as a business. Application of the amendments will 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, and 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 and MD&A.

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. We 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 entity 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 Canadian Asset Liability Method ("CALM") permitted by IFRS 4. While there are many differences, we have outlined two of the key differences:

- Under IFRS 17, the discount rate used to estimate the present value of liabilities is based on the characteristics of the liability, whereas under CALM, as outlined above ("Critical Actuarial and Accounting Policies – Determination of Policy Liabilities – Investment Returns"), we use the rate of returns for current and projected assets supporting the policy liabilities to value the liabilities. The difference in the discount rate approach also impacts the timing of investment-related experience earnings emergence. As outlined in the "Performance and Non-GAAP measures" section below, under CALM investment-related experience includes investment experience and the impact of investing activities. The impact of the 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 the 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.

Risk Factors

Our insurance, wealth and asset management and other financial services businesses subject Manulife to a broad range of risks. Management has identified the following risks and uncertainties to which our businesses, operations and financial condition are subject. The risks and uncertainties described below are not the only ones facing us. Additional risks not presently known to us or that we currently deem immaterial could also impair our businesses, operations and financial condition. If any of such risks should occur, the trading price of our securities, including common shares, preferred shares and debt securities, could decline, and you may lose all or part of your investment.

Strategic Risk Factors

We operate in highly competitive markets and compete for customers with both insurance and non-insurance financial services companies. Customer loyalty and retention, and access to distributors, are important to the Company's success and are influenced by many factors, including our distribution practices and regulations, product features, service levels, prices, and our financial strength ratings and reputation.

We may not be successful in executing our business strategies or these strategies may not achieve our objectives.

- Refer to "Risk Management – Strategic Risk" above.
- The economic environment could be volatile and our regulatory environment will continue to evolve, potentially with higher capital requirements which could materially impact our competitiveness. Further, the attractiveness of our product offerings relative to our competitors will be influenced by competitor actions as well as our own, and the requirements of the applicable regulatory regimes. For these and other reasons, there is no certainty that we will be successful in implementing our business strategies or that these strategies will achieve the objectives we target.
- Macro-economic factors may result in our inability to achieve business strategies and plans. Of note, economic factors such as flat or declining equity markets, equity market volatility, or a period of prolonged low interest rates could impact our ability to achieve business objectives. Other factors, such as management actions taken to bolster capital and manage the Company's risk profile, including new or amended reinsurance agreements, and additional actions that the Company may take to help manage near-term regulatory capital ratios or help mitigate equity market and interest rate exposures, could adversely impact our longer-term earnings potential.

Our insurance businesses are heavily regulated, and changes in regulation may reduce our profitability and limit our growth.

- Our insurance operations are subject to a wide variety of insurance and other laws and regulations. Insurance and securities regulators in Canada, the United States, Asia and other jurisdictions regularly re-examine existing laws and regulations applicable to insurance companies, investment advisors, brokers-dealers and their products. Compliance with applicable laws and regulations is time consuming and personnel-intensive, and changes in these laws and regulations or in the interpretation or enforcement thereof, may materially increase our direct and indirect compliance costs and other expenses of doing business, thus having a material adverse effect on our results of operations and financial condition.
- In addition, international regulators as well as domestic financial authorities and regulators in many countries have been reviewing their capital requirements and are implementing, or are considering implementing, changes aimed at strengthening risk management and capitalization of financial institutions. Future regulatory capital, actuarial and accounting changes, including changes with a retroactive impact, could have a material adverse effect on the Company's consolidated financial condition, results of operations and regulatory capital both on transition and going forward. In addition, such changes could have a material adverse effect on the Company's position relative to that of other Canadian and international financial institutions with which Manulife competes for business and capital.
- In Canada, MFC and its principal operating subsidiary, MLI, are governed by the Insurance Companies Act (Canada) ("ICA"). The ICA is administered, and the activities of the Company are supervised, by the Office of the Superintendent of Financial Institutions ("OSFI"). MLI is also subject to regulation and supervision under the insurance laws of each of the provinces and territories of Canada. Regulatory oversight is vested in various governmental agencies having broad administrative power with respect to, among other things, dividend payments, capital adequacy and risk-based capital requirements, asset and reserve valuation requirements, permitted investments and the sale and marketing of insurance contracts. These regulations are intended to protect policyholders and beneficiaries rather than investors and may adversely impact shareholder value.
- Some recent examples of regulatory and professional standard developments, in addition to the developments outlined in the "Risk Management – Regulatory Updates" section above, which could impact our net income attributed to shareholders and/or capital position are provided below.
    - The International Association of Insurance Supervisors ("IAIS") is expected to finalize the risk-based global Insurance Capital Standard ("ICS") during 2019. ICS will apply to all large internationally active insurance groups, and the IAIS's intention is to require annual reporting to OSFI on a confidential basis for five years, starting in 2020, before the standard becomes effective in 2025. The IAIS has also been developing a holistic framework to assess and mitigate insurance sector systemic risk, which includes reviewing the activities of insurers. It is not yet known how these proposals will affect capital requirements and Manulife's competitive position given that several key items for these developments remain under discussion.
    - The National Association of Insurance Commissioners ("NAIC") has been reviewing reserving and capital methodologies as well as the overall risk management framework. These reviews will affect U.S. life insurers, including John Hancock, and

could lead to increased reserving and/or capital requirements for our business in the U.S. In addition, the NAIC is continuing to explore the development of a group capital calculation tool; however, the scope of any such tool has not yet been determined.

- The Actuarial Standards Board ("ASB") promulgates certain assumptions referenced in the CIA Standards of Practice for the valuation of insurance contract liabilities. These promulgations are updated periodically and in the event that new promulgations are published, they will apply to the determination of actuarial liabilities and may lead to an increase in actuarial liabilities and a reduction in net income attributed to shareholders.
- In the United States, state insurance laws regulate most aspects of our business, and our U.S. insurance subsidiaries are regulated by the insurance departments of the states in which they are domiciled and the states in which they are licensed. State laws grant insurance regulatory authorities broad administrative powers with respect to, among other things: licensing companies and agents to transact business; calculating the value of assets to determine compliance with statutory requirements; mandating certain insurance benefits; regulating certain premium rates; reviewing and approving policy forms; regulating unfair trade and claims practices, including through the imposition of restrictions on marketing and sales practices, distribution arrangements and payment of inducements; regulating advertising; protecting privacy; establishing statutory capital and reserve requirements and solvency standards; fixing maximum interest rates on insurance policy loans and minimum rates for guaranteed crediting rates on life insurance policies and annuity contracts; approving changes in control of insurance companies; restricting the payment of dividends and other transactions between affiliates; and regulating the types, amounts and valuation of investments. Changes in any such laws and regulations, or in the interpretation or enforcement thereof by regulators, could significantly affect our business, results of operations and financial condition.
- Currently, the U.S. federal government does not directly regulate the business of insurance. However, federal legislation and administrative policies in several areas can significantly and adversely affect state regulated insurance companies. These areas include financial services regulation, securities regulation, pension regulation, privacy, tort reform legislation and taxation. In addition, under the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank"), the U.S. Board of Governors of the Federal Reserve has supervisory powers over non-bank financial companies that are determined to be systemically important. For further discussion on Dodd-Frank, refer to the risk factor entitled "Dodd-Frank adversely impacts our results of operations and our liquidity".
- Insurance guaranty associations in Canada and the United States have the right to assess insurance companies doing business in their jurisdiction for funds to help pay the obligations of insolvent insurance companies to policyholders and claimants. Because the amount and timing of an assessment is beyond our control, the liabilities that we have currently established for these potential liabilities may not be adequate.
- While many of the laws and regulations to which we are subject are intended to protect policyholders, beneficiaries, depositors and investors in our products and services, others also set standards and requirements for the governance of our operations. Failure to comply with applicable laws or regulations could result in financial penalties or sanctions, and damage our reputation.
- From time to time, regulators raise issues during examinations or audits of Manulife that could have a material adverse impact on us. We cannot predict whether or when regulatory actions may be taken that could adversely affect our operations. For further discussion of government regulation and legal proceedings refer to "Government Regulation" in MFC's Annual Information Form dated February 13, 2019 and note 18 of the 2018 Annual Consolidated Financial Statements. Refer to the risk factor "Our non-North American operations face political, legal, operational and other risks that could negatively affect those operations or our results of operations and financial condition" for further discussion on the impact to our operations.

Dodd-Frank adversely impacts our results of operations and our liquidity.

- Dodd-Frank establishes a framework for regulation of over-the-counter ("OTC") derivatives which affects activities of the Company that use derivatives for various purposes, including hedging equity market, interest rate and foreign currency exposures. Regulations promulgated by the U.S. Commodity Futures Trading Commission ("CFTC") and proposed by the U.S. Securities and Exchange Commission ("SEC") under Dodd-Frank require certain types of OTC derivative transactions to be cleared through a regulated clearinghouse, and a subset of such transactions to be executed through a centralized exchange or regulated facility. These CFTC rules impose, and the SEC rules may impose, additional costs on the Company.
- Both cleared and non-cleared derivative transactions are now subject to margin requirements under Dodd-Frank. Cleared derivatives transactions are subject to daily initial margin, and variation margin requirements imposed by the clearinghouse, while our non-cleared derivatives are subject to daily variation margin requirements. These margin requirements impose costs and increase liquidity risk for the Company. These margin requirements combined with the more restricted list of securities that qualify as eligible collateral for both cleared and non-cleared derivatives require us to hold larger positions in cash and treasuries, which could reduce net income attributed to shareholders.
- In-force OTC derivative transactions are grandfathered and will migrate to clearinghouses over time, or the Company may elect to accelerate the migration. As such, this may not become a significant risk for Manulife until a large portion of our derivatives have transitioned to clearinghouses (expected in the 2021 to 2023 timeframe) and market conditions adverse to liquidity (material increases in interest rates and/or equity markets) have been experienced. However, in certain situations such as ratings downgrade, our counterparties may be able to accelerate the transition by exercising any potential rights to terminate the contract. Some OTC derivative contracts also give Manulife and its counterparties the right to cancel the contract after specific dates. Any such cancellation by our counterparties could accelerate the transition to clearing.
- Manulife has been closely monitoring the evolving regulations and industry trends pertaining to these requirements.

International Financial Reporting Standards will have a material impact on our financial results.

- As outlined in the Critical Actuarial and Accounting Policies section above, the IASB issued a new accounting standard for insurance contracts in 2017, with an effective date of 2021 (in November 2018, the IASB tentatively decided to defer the effective date of IFRS 17 by one year). Until this standard is effective, IFRS does not currently prescribe an insurance contract measurement model and therefore, as permitted by IFRS 4 "Insurance Contracts", insurance contract liabilities continue to be measured using CALM. Under CALM, the measurement of actuarial liabilities is based on projected liability cash flows, together with estimated future premiums and net investment income generated from assets held to support those liabilities. A summary of some of the key changes are outlined in the "Critical Actuarial and Accounting Policies – Future Accounting and Reporting Changes" section above.
- The standard could create material volatility in our financial results and capital position; and could result in a lower discount rate used for the determination of actuarial liabilities, thereby increasing our actuarial liabilities and reducing our equity. The Company's capital position (see note below) and income for accounting purposes could be significantly influenced by prevailing market conditions, resulting in volatility of reported results, that may necessitate changes to business strategies. The standard requires that margins created from the sale of new business are deferred in full, eliminating accounting gains at the time of sale. Note: The regulatory capital framework in Canada is currently aligned with IFRS. In Canada, OSFI will decide on the appropriate recognition of the accounting outcomes within the regulatory capital framework.
- Additionally, other jurisdictions may not adopt the standard as issued or on the same timeline as published by the IASB, and there is a possibility that Canada will be the first to adopt the standard. Adopting the standard in Canada before it is adopted elsewhere could increase our cost of capital compared with global competitors and the banking sector in Canada.
- Any mismatch between the underlying economics of our business and the new accounting standard could have significant unintended negative consequences on our business model; and potentially affect our customers, shareholders and the capital markets.

Changes in tax laws, tax regulations, or interpretations of such laws or regulations could make some of our products less attractive to consumers, could increase our corporate taxes or cause us to change the value of our deferred tax assets and liabilities as well as our tax assumptions included in the valuation of our policy liabilities. This could have a material adverse effect on our business, results of operations and financial condition.

- Many of the products that the Company sells benefit from one or more forms of preferred tax treatment under current income tax regimes. For example, the Company sells life insurance policies that benefit from the deferral or elimination of taxation on earnings accrued under the policy, as well as permanent exclusion of certain death benefits that may be paid to policyholders' beneficiaries. We also sell annuity contracts that allow the policyholders to defer the recognition of taxable income earned within the contract. Other products that the Company sells, such as certain employer-paid health and dental plans, also enjoy similar, as well as other, types of tax advantages. The Company also benefits from certain tax benefits, including tax-exempt interest, dividends-received deductions, tax credits (such as foreign tax credits), and favourable tax rates and/or income measurement rules for tax purposes.
- There is risk that tax legislation could be enacted that would lessen or eliminate some or all of the tax advantages currently benefiting the Company or its policyholders or its other clients. This could occur in the context of deficit reduction or other tax reforms. The effects of any such changes could result in materially lower product sales, lapses of policies currently held, and/or our incurrence of materially higher corporate taxes, any of which could have a material adverse effect on our business, results of operations and financial condition.
- Additionally, the Company may be required to change its provision for income taxes or carrying amount of deferred tax assets or liabilities if the characterization of certain items is successfully challenged by taxing authorities or if future transactions or events, which could include changes in tax laws, tax regulations or interpretations of such laws or regulations, occur. Any such changes could significantly affect the amounts reported in the Consolidated Financial Statements in the year these changes occur.
- The U.S. government enacted the Tax Cuts and Jobs Act effective January 1, 2018 ("U.S. Tax Reform"). The legislation makes broad and complex changes to the U.S. tax code including reducing individual and corporate tax rates and permitting expensing of many capital expenditures. In addition, the law limits the deductibility of policy reserves for U.S. federal income tax purposes. Regulations and further guidance from the Internal Revenue Service and other bodies continues to be developed and released, implementing and/or clarifying the legislation. Any further changes or amendments to the law or its interpretation could result in material change to our tax balances.
- In the long run, U.S. Tax Reform, all else being equal, could lead to a reduction in corporate borrowings and lower borrowings could lead to tighter spreads.

Access to capital may be negatively impacted by market conditions.

- Disruptions, uncertainty or volatility in the financial markets may limit our access to capital required to operate our business. Such market conditions may limit our ability to satisfy regulatory capital requirements, to access the capital necessary to grow our business and meet our refinancing requirements. Under extreme conditions, we may be forced, among other things, to delay raising capital, issue different types of capital than we would otherwise, less effectively deploy such capital, issue shorter term securities than we prefer, or issue securities that bear an unattractive cost of capital which could decrease our profitability, dilute our existing shareholders, and significantly reduce our financial flexibility.

We may experience future downgrades in our financial strength or credit ratings, which may materially adversely impact our financial condition and results of operations.

- Credit rating agencies publish financial strength ratings on life insurance companies that are indicators of an insurance company's ability to meet contract holder and policyholder obligations. Credit rating agencies also assign credit ratings, which are indicators of

an issuer's ability to meet the terms of its obligations in a timely manner and are important factors in a company's overall funding profile and ability to access external capital.

- Ratings are important factors in establishing the competitive position of insurance companies, maintaining public confidence in products being offered, and determining the cost of capital. A ratings downgrade, or the potential for such a downgrade could, among other things: increase our cost of capital and limit our access to the capital markets; cause some of our existing liabilities to be subject to acceleration, additional collateral support, changes in terms, or additional financial obligations; result in the termination of our relationships with broker-dealers, banks, agents, wholesalers and other distributors of our products and services; unfavourably impact our ability to execute on our hedging strategies; materially increase the number of surrenders, for all or a portion of the net cash values, by the owners of policies and contracts we have issued, and materially increase the number of withdrawals by policyholders of cash values from their policies; and reduce new sales. Any of these consequences could adversely affect our results of operations and financial condition.
- Credit rating agencies noted risks with respect to: our capital and net earnings volatility associated with fair-value accounting; net residual exposures to equity markets and lower interest rates; challenges associated with managing in-force long-term care, universal life with secondary guarantees and variable annuity products in the U.S.; relatively high proportion of holdings in equities and alternative long-duration assets within our investment mix; as well as elevated financial leverage. There can be no guarantee that downgrades will not occur.
- It is possible that there will be changes in the benchmarks for capital, liquidity, earnings and other factors used by these credit rating agencies that are important to a ratings assignment at a particular rating level. Any such changes could have a negative impact on our ratings, which could adversely impact our results of operations, financial condition and access to capital markets.

Competitive factors may adversely affect our market share and profitability.

- The insurance, wealth and asset management industries are highly competitive. Our competitors include other insurers, securities firms, investment advisors, mutual funds, banks and other financial institutions. Financial service firms which rely heavily on technology-driven business models (e.g. fintech and insurtech firms) are also increasingly becoming potential competitors. Our competitors compete with us for customers, access to distribution channels such as brokers and independent agents, and for employees. In some cases, competitors may be subject to less onerous regulatory requirements, have lower operating costs or have the ability to absorb greater risk while maintaining their financial strength ratings, thereby allowing them to price their products more competitively or offer features that make their products more attractive. These competitive pressures could result in lower new business volumes and increased pricing pressures on a number of our products and services that may harm our ability to maintain or increase our profitability. Because of the highly competitive nature of the financial services industry, there can be no assurance that we will continue to effectively compete with our industry rivals and competitive pressure may have a material adverse effect on our business, results of operations and financial condition.

We may experience difficulty in marketing and distributing products through our current and future distribution channels.

- We distribute our insurance and wealth management products through a variety of distribution channels, including brokers, independent agents, broker-dealers, banks, wholesalers, affinity partners, other third-party organizations and our own sales force in Asia. We generate a significant portion of our business through individual third-party arrangements. We periodically negotiate provisions and renewals of these relationships, and there can be no assurance that such terms will remain acceptable to us or relevant third parties. An interruption in our continuing relationship with certain of these third parties could significantly affect our ability to market our products and could have a material adverse effect on our business, results of operations and financial condition.

Industry trends could adversely affect the profitability of our businesses.

- Our business segments continue to be influenced by a variety of trends that affect our business and the financial services industry in general. The impact of the volatility and instability of the financial markets on our business is difficult to predict. The Company's business plans, financial condition and results of operations have been in the recent past and may in the future be negatively impacted or affected.

We may face unforeseen liabilities or asset impairments arising from possible acquisitions and dispositions of businesses or difficulties integrating acquired businesses.

- We have engaged in acquisitions and dispositions of businesses in the past and expect to continue to do so in the future as we may deem appropriate. There could be unforeseen liabilities or asset impairments, including goodwill impairments that arise in connection with the businesses that we may sell, have acquired, or may acquire in the future. In addition, there may be liabilities or asset impairments that we fail, or are unable, to discover in the course of performing due diligence investigations on acquisition targets. Furthermore, the use of our own funds as consideration in any acquisition would consume capital resources that would no longer be available for other corporate purposes.
- Our ability to achieve some or all of the benefits we anticipate from any acquisitions of businesses will depend in large part upon our ability to successfully integrate the businesses in an efficient and effective manner. We may not be able to integrate the businesses smoothly or successfully, and the process may take longer than expected. The integration of operations may require the dedication of significant management resources, which may distract management's attention from our day-to-day business. Acquisitions of operations outside of North America, especially any acquisition in a jurisdiction in which we do not currently operate, may be particularly challenging or costly to integrate. If we are unable to successfully integrate the operations of any

acquired businesses, we may be unable to realize the benefits we expect to achieve as a result of the acquisitions and the results of operations may be less than expected.

If our businesses do not perform well, or if the outlook for our businesses is significantly lower than historical trends, we may be required to recognize an impairment of goodwill or intangible assets or to establish a valuation allowance against our deferred tax assets, which could have a material adverse effect on our results of operations and financial condition.

- Goodwill represents the excess of the amounts we paid to acquire subsidiaries and other businesses over the fair value of their net identifiable assets at the date of acquisition. Intangible assets represent assets that are separately identifiable at the time of an acquisition and provide future benefits such as the John Hancock brand.
- As outlined above, in section "Critical Actuarial and Accounting, Goodwill and Intangibles", goodwill and intangible assets with indefinite lives are tested at least annually for impairment at the cash generating unit ("CGU") or group of CGUs level, representing the smallest group of assets that is capable of generating largely independent cash flows. Going forward, as a result of the impact of economic conditions and changes in product mix and the granular level of goodwill testing under IFRS, additional impairment charges could occur in the future. Any impairment in in goodwill would not affect LICAT capital.
- If market conditions deteriorate in the future and, in particular, if MFC's common share price is low relative to book value per share, if the Company's actions to limit risk associated with its products or investments cause a significant change in any one CGU's recoverable amount, or if the outlook for a CGU's results deteriorate, the Company may need to reassess the value of goodwill and/or intangible assets which could result in impairments during 2019 or subsequent periods. Such impairments could have a material adverse effect on our results of operations and financial condition.
- Deferred income tax balances represent the expected future tax effects of the differences between the book and tax basis of assets and liabilities, loss carry forwards and tax credits. Deferred tax assets are recorded when the Company expects to claim deductions on tax returns in the future for expenses that have already been recorded in the financial statements.
- The availability of those deductions is dependent on future taxable income against which the deductions can be made. Deferred tax assets are assessed periodically by management to determine if they are realizable. Factors in management's determination include the performance of the business including the ability to generate gains from a variety of sources and tax planning strategies. If based on information available at the time of the assessment, it is determined that the deferred tax asset will not be realized, then the deferred tax asset is reduced to the extent that it is no longer probable that the tax benefit will be realized.

We may not be able to protect our intellectual property and may be subject to infringement claims.

- We rely on a combination of contractual rights and copyright, trademark, patent and trade secret laws to establish and protect our intellectual property. In particular, we have invested considerable resources in promoting the brand names "Manulife" and "John Hancock" and expect to continue to do so. Although we use a broad range of measures to protect our intellectual property rights, third parties may infringe or misappropriate our intellectual property. We may have to litigate to enforce and protect our copyrights, trademarks, patents, trade secrets and know-how or to determine their scope, validity or enforceability, which represents a diversion of resources that may be significant in amount and may not prove successful. The loss of intellectual property protection or the inability to secure or enforce the protection of our intellectual property assets could have a material adverse effect on our business and our ability to compete.
- We also may be subject to costly litigation in the event that another party alleges our operations or activities infringe upon its intellectual property rights. Third parties may have, or may eventually be issued, patents that could be infringed by our products, methods, processes or services. Any party that holds such a patent could make a claim of infringement against us. We may also be subject to claims by third parties for breach of copyright, trademark, trade secret or license usage rights. Any such claims and any resulting litigation could result in significant liability for damages. If we were found to have infringed a third-party patent or other intellectual property rights, we could incur substantial liability, and in some circumstances could be enjoined from providing certain products or services to our customers or utilizing and benefiting from certain methods, processes, copyrights, trademarks, trade secrets or licenses, or alternatively could be required to enter into costly licensing arrangements with third parties, all of which could have a material adverse effect on our business, results of operations and financial condition.

Applicable laws may discourage takeovers and business combinations that common shareholders of MFC might consider in their best interests.

- The ICA contains restrictions on the purchase or other acquisition, issue, transfer and voting of the shares of an insurance company. In addition, under applicable U.S. insurance laws and regulations in states where certain of our insurance company subsidiaries are domiciled, no person may acquire control of MFC without obtaining prior approval of those states' insurance regulatory authorities. These restrictions may delay, defer, prevent, or render more difficult a takeover attempt that common shareholders of MFC might consider in their best interests. For instance, they may prevent shareholders of MFC from receiving the benefit from any premium to the market price of MFC's common shares offered by a bidder in a takeover context. Even in the absence of a takeover attempt, the existence of these provisions may adversely affect the prevailing market price of MFC's common shares if they are viewed as discouraging takeover attempts in the future.

Entities within the MFC Group are interconnected which may make separation difficult.

- MFC operates in local markets through subsidiaries and branches of subsidiaries. These local operations are financially and operationally interconnected to lessen expenses, share and reduce risk, and efficiently utilize financial resources. In general, external capital required for companies in the Manulife group has been raised at the MFC or MLI level and then transferred to other entities

as equity or debt capital as appropriate. Other linkages include policyholder and other creditor guarantees and other forms of internal support between various entities, loans, capital maintenance agreements, derivatives, shared services and affiliate reinsurance treaties. Accordingly, the risks undertaken by a subsidiary may be transferred to or shared by affiliates through financial and operational linkages. Some of the consequences of this are:

- Financial difficulties at a subsidiary may not be isolated and could cause material adverse effects on affiliates and the group as a whole.
- Linkages may make it difficult to dispose of or separate a subsidiary or business within the group by way of a spin-off or similar transaction and the disposition or separation of a subsidiary or business may not fully eliminate the liability of the Company and its remaining subsidiaries for shared risks. Issues raised by such a transaction could include: (i) the Company cannot terminate, without policyholder consent and in certain jurisdictions regulator consent, parental guarantees on in-force policies and therefore would continue to have residual risk under any such non-terminated guarantees; (ii) internal capital mobility and efficiency could be limited; (iii) significant potential tax consequences; (iv) uncertainty about the accounting and regulatory outcomes of such a transaction; (v) obtaining any other required approvals; (vi) there may be a requirement for significant capital injections; and (vii) the transaction may result in increased sensitivity of net income attributed to shareholders and capital of MFC and its remaining subsidiaries to market declines.

Market Risk Factors

Market risk is the risk of loss resulting from market price volatility, interest rate change, credit and swap spread changes, and from adverse foreign currency rate movements. Market price volatility primarily relates to changes in prices of publicly traded equities and alternative long-duration assets.

Liquidity risk, which we manage as a form of market risk, is the risk of not having access to sufficient funds or liquid assets to meet both expected and unexpected cash outflows and collateral demand. We are exposed to liquidity risk in each of our operating companies and in our holding company. In the operating companies, expected cash and collateral demands arise day-to-day to fund anticipated policyholder benefits, withdrawals of customer deposit balances, reinsurance settlements, derivative instrument settlements/collateral pledging, expenses, investment and hedging activities. Under stressed conditions, unexpected cash and collateral demands could arise primarily from a change in the level of policyholders either terminating policies with large cash surrender values or not renewing them when they mature, withdrawals of customer deposit balances, borrowers renewing or extending their loans when they mature, derivative settlements or collateral demands, and reinsurance settlements or collateral demands.

Our most significant source of publicly traded equity risk arises from variable annuity and segregated funds with guarantees, where the guarantees are linked to the performance of the underlying funds.

- Publicly traded equity performance risk arises from a variety of sources, including guarantees associated with variable annuity and segregated fund products, asset based fees, and investments in publicly traded equities.
- Guaranteed benefits are contingent and payable upon death, maturity, permitted withdrawal or annuitization. If equity markets decline or even if they increase by an amount lower than that assumed in our actuarial valuation, additional liabilities may need to be established to cover the contingent liabilities, resulting in a reduction in net income attributed to shareholders and regulatory capital ratios. Further, if equity markets do not recover to the amount of the guarantees, by the dates the liabilities are due, the accrued liabilities will need to be paid out in cash. In addition, sustained flat or declining public equity markets would likely reduce asset based fee revenues related to variable annuities and segregated funds with guarantees and related to other wealth and insurance products.
- Where publicly traded equity investments are used to support policy liabilities, the policy valuation incorporates projected investment returns on these assets. If actual returns are lower than the expected returns, the investment losses will reduce net income attributed to shareholders.
- For products where the investment strategy applied to future cash flows in the policy valuation includes investing a specified portion of future cash flows in publicly traded equities, a decline in the value of publicly traded equities relative to other assets could require us to change the investment mix assumed for future cash flows, which may increase policy liabilities and reduce net income attributed to shareholders. A reduction in the outlook for expected future returns for publicly traded equities, which could result from a fundamental change in future expected economic growth, would increase policy liabilities and reduce net income attributed to shareholders. Furthermore, to the extent publicly traded equities are held as AFS, other than temporary impairments that arise will reduce income.
- Expected long-term annual market growth assumptions for public equities for key markets are based on long-term historical observed experience. See Critical Actuarial and Accounting Policies for the rates used in the stochastic valuation of our segregated fund guarantee business. The calibration of the economic scenario generators that are used to value segregated fund guarantee business complies with current CIA Standards of Practice for the valuation of these products. Implicit margins, determined through stochastic valuation processes, lower net yields used to establish policy liabilities. Assumptions used for public equities backing liabilities are also developed based on historical experience but are constrained by different CIA Standards of Practice and differ slightly from those used in stochastic valuation. Alternative asset return assumptions vary based on asset class but are largely consistent, after application of valuation margins and differences in taxation, with returns assumed for public equities.

We experience interest rate and spread risk within the general fund primarily due to the uncertainty of future returns on investments.

- Interest rate and spread risk arises from general fund guaranteed benefit products, general fund adjustable benefit products with minimum rate guarantees, general fund products with guaranteed surrender values, segregated fund products with minimum benefit guarantees and from surplus fixed income investments. The risk arises within the general fund primarily due to the uncertainty of future returns on investments to be made as assets mature and as recurring premiums are received and invested or reinvested to support longer dated liabilities. Interest rate risk also arises due to minimum rate guarantees and guaranteed surrender values on products where investment returns are generally passed through to policyholders. A rapid rise in interest rates may also result in losses attributable to early liquidation of fixed income instruments supporting contractual surrender benefits, if customers surrender to take advantage of higher interest rates on offer elsewhere. In order to reduce interest rate risk, the duration of fixed income investments is managed by entering into interest rate hedges.
- The valuation of policy liabilities reflects assumptions for the yield on future investments and the projected cash flows associated with interest rate hedges. A general decline in interest rates, without a change in corporate bond spreads and swap spreads, will reduce the assumed yield on future investments but favourably impact the value of lengthening interest rate hedges. Conversely, a general increase in interest rates, without a change in corporate bond spreads and swap spreads, will increase the assumed yield on future investments, but unfavourably impact the value of lengthening interest rate hedges. The Company's disclosed estimated impact from interest rate movements reflects a parallel increase and decrease in interest rates of specific amounts. The reinvestment assumptions used in the valuation of our insurance liabilities are based on interest rate scenarios and calibration criteria set by the Actuarial Standards Board, while our interest rate hedges are valued using current market interest rates. Therefore, in any particular quarter, changes to the reinvestment assumptions are not fully aligned to changes in current market interest rates especially when there is a significant change in the shape of the interest rate curve. As a result, the impact from non-parallel movements may be different from the estimated impact of parallel movements. Furthermore, changes in interest rates could change the reinvestment scenarios used in the calculation of our actuarial liabilities. The reinvestment scenario changes tend to amplify the negative effects of a decrease in interest rates and dampen the positive effects of interest rate increases. In addition, decreases in corporate bond spreads or increases in swap spreads should generally result in an increase in policy liabilities and a reduction in net income attributed to shareholders, while an increase in corporate bond spreads or a decrease in swap spreads should generally have the opposite impact. The impact of changes in interest rates and in spreads may be partially offset by changes to credited rates on adjustable products that pass-through investment returns to policyholders.
- For segregated fund and variable annuity products, a sustained increase in interest rate volatility or a decline in interest rates would also likely increase the costs of hedging the benefit guarantees provided.

We experience ALDA performance risk when actual returns are lower than expected returns.

- ALDA performance risk arises from general fund investments in commercial real estate, timber properties, farmland properties, infrastructure, oil and gas properties, and private equities.
- Where these assets are used to support policy liabilities, the policy valuation incorporates projected investment returns on these assets. ALDA assumptions vary by asset class and generally have a similar impact on policy liabilities as public equities would. If actual returns are lower than the expected returns, there will be a negative impact to the net income attributed to shareholders. A reduction in the outlook for expected future returns for ALDA, which could result from a variety of factors such as a fundamental change in future expected economic growth or declining risk premiums due to increased competition for such assets, would increase policy liabilities and reduce net income attributed to shareholders. Further, if returns on certain external asset benchmarks used to determine permissible assumed returns under the CIA Standards of Practice are lower than expected, the Company's policy liabilities will increase, reducing net income attributed to shareholders.
- In recent periods, the value of oil and gas assets has been negatively impacted by the decline in energy prices and could be further adversely affected by additional declines in energy prices as well as by a number of other factors including production declines, uncertainties associated with estimating oil and natural gas reserves, difficult economic conditions and geopolitical events. Changes in government regulation of the oil and gas industry, including environmental regulation, carbon taxes and changes in the royalty rates resulting from provincial royalty reviews, could also adversely affect the value of our oil and gas investments.
- Difficult economic conditions could result in higher vacancy, lower rental rates and lower demand for real estate investments, all of which would adversely impact the value of our real estate investments. Difficult economic conditions could also prevent companies in which we have made private equity investments from achieving their business plans and could cause the value of these investments to fall, or even cause the companies to fail. Declining valuation multiples in the public equity market would also likely cause values to decline in our private equity portfolio. The timing and amount of investment income from private equity investments is difficult to predict, and investment income from these investments can vary from quarter to quarter.
- Our timberland and farmland holdings are exposed to natural risks, such as prolonged drought, wildfires, insects, windstorms, flooding, and climate change. We are generally not insured for these types of risks but seek to mitigate their impact through portfolio diversification and prudent operating practices.
- More broadly, a rising interest rate environment could result in the value of some of our ALDA investments declining, particularly those with fixed contractual cash flows such as real estate.
- The negative impact of changes in these factors can take time to be fully reflected in the valuations of private investments, including ALDA, especially if the change is large and rapid, as market participants adjust their forecasts and better understand the potential medium to long-term impact of such changes. As a result, valuation changes in any given period may reflect the delayed impact of events that occurred in prior periods.

- We rely on a diversified portfolio of ALDA assets to generate relatively stable investment returns. Diversification benefits may be reduced at times, especially during a period of economic stress, which would adversely affect portfolio returns.
- The Company determines investment return assumptions for ALDA in accordance with the Standards of Practice for the valuation of insurance contract liabilities and guidance published by the CIA. The guidance requires that the investment return assumption for these assets should not be higher than the historical long-term average returns of an appropriate broad-based index. Where such experience is not available, the investment return assumption for these assets should not result in a lower reserve than an assumption based on a historical-return benchmark for public equities in the same jurisdiction. As a result, the impact of changes in the historical returns for public equity benchmarks may result in an update to our investment return assumptions for ALDA.

Our liabilities are valued based on an assumed asset investment strategy over the long term.

- We develop an investment strategy for the assets that back our liabilities. The strategy involves making assumptions on the kind of assets in which we will invest and the returns such assets will generate.
- We may not be able to implement our investment strategy as intended due to a lack of assets available at the returns we assume. This may result in a change in investment strategy and/or assumed future returns, thus adversely impacting our financial results.
- From time to time we may decide to adjust our portfolio asset mix which may result in adverse impacts to our financial results for one or more periods. On December 22, 2017, we announced our decision to reduce the allocation to ALDA in our portfolio asset mix resulting in a charge to net income attributed to shareholders in 4Q17 of approximately $1 billion post-tax.

We experience foreign exchange risk as a substantial portion of our business is transacted in currencies other than Canadian dollars.

- Our financial results are reported in Canadian dollars. A substantial portion of our business is transacted in currencies other than Canadian dollars, mainly U.S. dollars, Hong Kong dollars and Japanese yen. If the Canadian dollar strengthens relative to these currencies, net income attributed to shareholders would decline and our reported shareholders' equity would decline. A weakening of the Canadian dollar against the foreign currencies in which we do business would have the opposite effect and would increase net income attributed to shareholders and shareholders' equity.

The Company's hedging strategies will not fully reduce the market risks related to the product guarantees and fees being hedged, hedging costs may increase and the hedging strategies expose the Company to additional risks.

- The Company's market risk hedging strategies include a variable annuity guarantee dynamic hedging strategy and a macro equity risk hedging strategy. The variable annuity dynamic hedging strategy is designed to hedge the sensitivity of variable annuity guarantee policy liabilities to fund performance (both public equity and bond funds) and interest rate movements. The macro equity risk hedging strategy is designed to hedge a portion of our earnings sensitivity to public equity market movements arising from variable annuity guarantees not dynamically hedged and directly held exposures. Some of the limitations and risks associated with each strategy are described below.
- Our hedging strategies rely on the execution of derivative transactions in a timely manner. Therefore, hedging costs and the effectiveness of the strategy may be negatively impacted if markets for these instruments become illiquid. The Company is subject to the risk of increased funding and collateral demands which may become significant as equity markets increase.
- The Company is also subject to counterparty risks arising from the derivative instruments and to the risk of increased funding and collateral demands which may become significant as equity markets and interest rates increase. The strategies are highly dependent on complex systems and mathematical models that are subject to error and rely on forward-looking long-term assumptions that may prove inaccurate, and which rely on sophisticated infrastructure and personnel which may fail or be unavailable at critical times. Due to the complexity of the strategies, there may be additional unidentified risks that may negatively impact our business and future financial results. In addition, rising equity markets and interest rates that would otherwise result in profits on variable annuities will be offset by losses from our hedging positions. For further information pertaining to counterparty risks, refer to the risk factor "If a counterparty fails to fulfill its obligations we may be exposed to risks we had sought to mitigate".
- Under certain market conditions, which include a sustained increase in realized equity and interest rate volatilities, a decline in interest rates, or an increase in the correlation between equity returns and interest rate declines, the costs of hedging the benefit guarantees provided in variable annuities may increase or become uneconomic. In addition, there can be no assurance that our dynamic hedging strategy will fully offset the risks arising from the variable annuities being hedged.
- Policy liabilities and regulatory required capital for variable annuity guarantees are determined using long-term forward-looking estimates of volatilities. These long-term forward-looking volatilities assumed for policy liabilities and required capital meet the CIA and OSFI calibration standards. To the extent that realized equity or interest rate volatilities in any quarter exceed the assumed long-term volatilities, or correlations between interest rate changes and equity returns are higher, there is a risk that rebalancing will be greater and more frequent, resulting in higher hedging costs.
- The level of guarantee claims returns or other benefits ultimately paid will be impacted by policyholder longevity and policyholder activity including the timing and amount of withdrawals, lapses, fund transfers and contributions. The sensitivity of liability values to equity market and interest rate movements that we hedge are based on long-term expectations for longevity and policyholder activity, since the impact of actual longevity and policyholder experience variances cannot be hedged using capital markets instruments. There is a risk that we may be unable to effectively or economically hedge products which provide for guarantee claims, returns or other benefits.

Changes in market interest rates may impact our net income attributed to shareholders and capital ratios.

- A prolonged low interest rate environment may result in charges related to lower fixed income reinvestment assumptions and an increase in new business strain until products are repositioned for the lower rate environment. Other potential consequences of low interest rates include:
  - Low interest rates could negatively impact sales;
  - Lower risk-free rates tend to increase the cost of hedging, and as a result the offering of guarantees could become uneconomic;
  - The reinvestment of cash flows into low yielding bonds could result in lower future earnings on surplus;
  - A lower interest rate environment could be correlated with other macro-economic factors including unfavourable economic growth and lower returns on other asset classes;
  - Lower interest rates could contribute to potential impairments of goodwill;
  - Lower interest rates could lead to lower mean bond parameters used for the stochastic valuation of segregated fund guarantees, resulting in higher policy liabilities;
  - Lower interest rates would also reduce expected earnings onin-force policies, which would reduce core earnings, lower net income attributed to shareholders and may increase new business strain until products are repositioned for the lower rate environment;
  - A prolonged low interest environment may also result in the Actuarial Standards Board lowering the promulgated Ultimate Reinvestment Rate ("URR") and require us to increase our provisions;
  - The difference between the current investable returns and the returns used in pricing new business are generally capitalized when new business is written. Lower interest rates result in higher new business strain until products are re-priced or interest rates increase; and
  - Fixed income reinvestment rates other than the URR are based on current market rates. The net income sensitivity to changes in current rates is outlined in the section "Interest Rate and Spread Risk Sensitivities and Exposure Measures" above.
- A rapid rise in interest rates may also result in losses attributable to early liquidation of fixed income instruments supporting contractual surrender benefits if customers surrender to take advantage of higher interest rates on offer elsewhere.

With the continued production of LIBOR not guaranteed beyond 2021, the transition to alternative reference rates may adversely impact the valuation of our LIBOR-based financial instruments.

- The Company uses London Interbank Offered Rate ("LIBOR") based derivatives for the management of our interest rate risk and is reliant on the continued use of LIBOR as a reference rate in the marketplace. The Chief Executive of the U.K. Financial Conduct Authority ("FCA") has announced that, after 2021, the FCA would no longer use its power to persuade or compel panel banks to submit rate information used to determine LIBOR. To address the increased risk that LIBOR may not exist beyond 2021, public / private sector working groups have been formed in major currency jurisdictions to identify alternative reference rate benchmarks in currencies for which LIBOR is quoted. Any transition of LIBOR to an alternative reference rate may adversely affect the valuation of our existing debt securities and derivatives and the effectiveness of those derivatives in mitigating our risks. Furthermore, depending on the nature of the alternative reference rate, we may become exposed to additional risks from new debt or derivative transactions. The nature of these additional risks is yet to be estimated as the alternative reference rates are still being developed and published.

AFS investments are recorded at fair value, but losses arising on those investments may not have been recorded in income.

- Some of our investments are classified as AFS. AFS debt securities are recorded at fair value, but unrealized gains and losses are recorded in a separate component of equity and are not charged to net income attributed to shareholders while they are fully included in the LICAT available capital. Unrealized gains are recorded in net income attributed to shareholders when the related asset is sold. Unrealized losses are recorded in net income attributed to shareholders either when the related asset is sold or when the related asset is considered impaired and the impairment is not considered to be temporary. Should market levels decline, impairments may be judged to be other than temporary and part or all of any unrealized losses may be charged against future income as a result.
- Our valuation of certain financial instruments may include methodologies, estimations and assumptions which are subjective in nature. Changes to investment valuations may arise in the future which materially adversely affect our results of operations and financial condition.
- The fair value for certain of our investments that are not actively traded is determined using models and other valuation techniques. These values therefore incorporate considerable judgment and involve making estimates including those related to the timing and amounts of expected future cash flows and the credit standing of the issuer or counterparty. The use of different methodologies and assumptions may have a material effect on the estimated fair value amounts.
- Significant market disruption could result in rapidly widening credit spreads and illiquidity, volatile markets and for some instruments significantly reduced trading activity. It has been and may continue to be difficult to value certain of our securities if trading is less active and/or market data is harder to observe. Consequently, valuations may include inputs and assumptions that are less observable or require greater estimation thereby resulting in values which may differ materially from the value at which the investments may be ultimately sold. Further, rapidly changing credit and equity market conditions could materially impact the valuation of securities as reported within our Consolidated Financial Statements and the period-to-period changes in value could vary significantly. Decreases in value that become recognizable in future periods could have a material adverse effect on our results of operations and financial condition.

Liquidity Risk Factor

Liquidity risk is impacted by various factors, including but not limited to, capital and credit market conditions,re-pricing risk on letters of credit, collateral pledging obligations, and reliance on confidence sensitive deposits.

- Adverse market conditions may significantly affect our liquidity risk.
  - Reduced asset liquidity may restrict our ability to sell certain types of assets for cash without taking significant losses. If providers of credit preserve their capital, our access to borrowing from banks and others or access to other types of credit such as letters of credit, may be reduced. If investors have a negative perception of our creditworthiness, this may reduce access to wholesale borrowing in the debt capital markets or increase borrowing costs. Should large and unexpected cash outflows occur, exceeding our worst-case stress testing, we may be forced to sell assets at a loss or raise additional funds at significant cost in order to meet our liquidity needs.
  - We are dependent on cash flow from operations, a pool of highly liquid money market securities and holdings of sovereign bonds, near-sovereign bonds and other liquid marketable securities to provide liquidity. We need liquidity to meet our payment obligations including those related to insurance and annuity benefits, cashable liabilities, our operating expenses, interest on our debt, dividends on our equity capital, and to replace maturing and certain callable liabilities.
  - Liquid assets are also required to pledge as collateral to support activities such as the use of derivatives for hedging purposes and to cover cash settlement associated with such derivatives. Dodd-Frank has increased the number of derivatives transactions that must be cleared through regulated clearinghouses and has therefore increased our liquidity risk (as such cleared derivatives are subject to both initial margin and variation margin requirements, and a more restrictive set of eligible collateral than non-cleared derivatives). In addition, variation margin rules for non-cleared derivatives (including eligible collateral restrictions) have further increased our liquidity risk. The principal sources of our liquidity are cash and our assets that are readily convertible into cash, including insurance and annuity premiums, fee income earned on AUM, money market securities, and cash flow from our investment portfolio. The issuance of long-term debt, common and preferred shares and other capital securities may also increase our available liquid assets or be required to replace certain maturing or callable liabilities.
  - In the event we seek additional financing, the availability and terms of such financing will depend on a variety of factors including market conditions, the availability of credit to the financial services industry, our credit ratings and credit capacity, as well as the possibility that customers, lenders or investors could develop a negative perception of our long-term or short-term financial prospects if we incur large financial losses or if the level of our business activity decreases further due to a significant market downturn.
- We are exposed tore-pricing risk on letters of credit.
  - In the normal course of business, third-party banks issue letters of credit on our behalf. In lieu of posting collateral, our businesses utilize letters of credit for which third parties are the beneficiaries, as well as for affiliate reinsurance transactions between subsidiaries of MFC. Letters of credit and letters of credit facilities must be renewed periodically. At time of renewal, the Company is exposed to re-pricing risk and under adverse conditions increases in costs may be realized. In the most extreme scenarios, letters of credit capacity could become constrained due to non-renewals which would restrict our flexibility to manage capital. This could negatively impact our ability to meet local capital requirements or our sales of products in jurisdictions in which our operating companies have been affected. As at December 31, 2018, letters of credit for which third parties are beneficiary, in the amount of $74 million, were outstanding. There were no assets pledged against these outstanding letters of credit as at December 31, 2018.
- Our obligations to pledge collateral or make payments related to declines in value of specified assets may adversely affect our liquidity.
  - In the normal course of business, we are obligated to pledge assets to comply with jurisdictional regulatory and other requirements including collateral pledged in relation to derivative contracts and assets held as collateral for repurchase funding agreements. The amount of collateral we may be required to post under these agreements, and the amount of payments we are required to make to our counterparties, may increase under certain circumstances, including a sustained or continued decline in the value of our derivative contracts. Such additional collateral requirements and payments could have an adverse effect on our liquidity. As at December 31, 2018, total pledged assets were $5,041 million, compared with $4,633 million in 2017.
- Our banking subsidiary relies on confidence sensitive deposits and this increases our liquidity risk.
  - Manulife Bank is a wholly-owned subsidiary of our Canadian life insurance operating company, MLI. The Bank is principally funded by retail deposits. A real or perceived problem with the Bank or its parent companies could result in a loss of confidence in the Bank's ability to meet its obligations, which in turn may trigger a significant withdrawal of deposit funds. A substantial portion of the Bank's deposits are demand deposits that can be withdrawn at any time, while the majority of the Bank's assets are first residential mortgages in the form of home equity lines of credit, which represent long-term funding obligations. If deposit withdrawal speeds exceed our extreme stress test assumptions the Bank may be forced to sell assets at a loss to third parties or call the home equity lines of credit.

As a holding company, MFC depends on the ability of its subsidiaries to transfer funds to it to meet MFC's obligations and pay dividends.

- MFC is a holding company and relies on dividends and interest payments from our insurance and other subsidiaries as the principal source of cash flow to meet MFC's obligations and pay dividends. As a result, MFC's cash flows and ability to service its obligations are dependent upon the earnings of its subsidiaries and the distribution of those earnings and other funds by its subsidiaries to MFC. Substantially all of MFC's business is currently conducted through its subsidiaries.
- The ability of our holding company to fund its cash requirements depends upon it receiving dividends, distributions and other payments from our operating subsidiaries. The ability of MFC's insurance subsidiaries to pay dividends to MFC in the future will depend on their earnings and regulatory restrictions. These subsidiaries are subject to a variety of insurance and other laws and regulations that vary by jurisdiction and are intended to protect policyholders and beneficiaries in that jurisdiction first and foremost, rather than investors. These subsidiaries are generally required to maintain solvency and capital standards as set by their local regulators and may also be subject to other regulatory restrictions, all of which may limit the ability of subsidiary companies to pay dividends or make distributions to MFC. Such limits, could have a material adverse effect on MFC's liquidity, including its ability to pay dividends to shareholders and service its debt.
- The potential changes to regulatory capital and actuarial and accounting standards could also limit the ability of the insurance subsidiaries to pay dividends or make distributions and could have a material adverse effect on MFC's liquidity and on internal capital mobility, including on MFC's ability to pay dividends to shareholders and service its debt. We may be required to raise additional capital, which could be dilutive to existing shareholders, or to limit the new business we write, or to pursue actions that would support capital needs but adversely impact our subsequent earnings potential. In addition, the timing and outcome of these initiatives could have a significantly adverse impact on our competitive position relative to that of other Canadian and international financial institutions with which we compete for business and capital.
- The payment of dividends to MFC by MLI is subject to restrictions set out in the ICA. The ICA prohibits the declaration or payment of any dividend on shares of an insurance company if there are reasonable grounds for believing: (i) the company does not have adequate capital and adequate and appropriate forms of liquidity; or (ii) 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 the Superintendent. All of our U.S. and Asian operating life insurance companies are subsidiaries of MLI. Accordingly, a restriction on dividends from MLI would restrict MFC's ability to obtain dividends from its U.S. and Asian businesses.
- Certain of MFC's U.S. insurance subsidiaries also are subject to insurance laws in Michigan, New York and Massachusetts, the jurisdictions in which these subsidiaries are domiciled, which impose general limitations on the payment of dividends and other upstream distributions by these subsidiaries to MLI.
- Our Asian insurance subsidiaries are also subject to restrictions in the jurisdictions in which these subsidiaries are domiciled which could affect their ability to pay dividends to MLI in certain circumstances.
- The Company seeks to maintain capital in its insurance subsidiaries in excess of the minimum required in all jurisdictions in which the Company does business. The minimum requirements in each jurisdiction may increase due to regulatory changes and we may decide to maintain additional capital in our operating subsidiaries to fund expected growth of the business or to deal with changes in the risk profile of such subsidiaries. Any such increases in the level of capital may reduce the ability of the operating companies to pay dividends and have a material adverse effect on MFC's liquidity.

The declaration and payment of dividends and the amount thereof is subject to change.

- The holders of common shares are entitled to receive dividends as and when declared by the Board of Directors of MFC, subject to the preference of the holders of Class A Shares, Class 1 Shares, Class B Shares (collectively, the "Preferred Shares") and any other shares ranking senior to the common shares with respect to priority in payment of dividends. The declaration and payment of dividends and the amount thereof is subject to the discretion of the Board of Directors of MFC and is dependent upon the results of operations, financial condition, cash requirements and future prospects of, and regulatory and contractual restrictions on the payment of dividends by MFC and other factors deemed relevant by the Board of Directors of MFC. Although MFC has historically declared quarterly cash dividends on the common shares, MFC is not required to do so and the Board of Directors of MFC may reduce, defer or eliminate MFC's common share dividend in the future.
- The foregoing risk disclosure in respect of the declaration and payment of dividends on the common shares applies equally in respect of the declaration and payment of dividends on the Preferred Shares, notwithstanding that the Preferred Shares have a fixed rate of dividend.
- See "Government Regulation" and "Dividends" in MFC's Annual Information Form dated February 13, 2019 for a summary of additional statutory and contractual restrictions concerning the declaration of dividends by MFC.

Credit Risk Factors

Worsening regional and global economic conditions or the rise in interest rates could result in borrower or counterparty defaults or downgrades and could lead to increased provisions or impairments related to our general fund invested assets and off-balance sheet derivative financial instruments, and an increase in provisions for future credit impairments to be included in our policy liabilities. Any of our reinsurance providers being unable or unwilling to fulfill their contractual obligations related to the liabilities we cede to them could lead to an increase in policy liabilities.

Our invested assets primarily include investment grade bonds, private placements, commercial mortgages, asset-backed securities, and consumer loans. These assets are generally carried at fair value, but changes in value that arise from a credit-related impairment are

recorded as a charge against income. The return assumptions incorporated in actuarial liabilities include an expected level of future asset impairments. There is a risk that actual impairments will exceed the assumed level of impairments in the future and earnings could be adversely impacted.

Volatility may arise from defaults and downgrade charges on our invested assets and as a result, losses could potentially rise above long-term expected levels. Net impaired fixed income assets were $179 million, representing 0.05% of total general fund invested assets as at December 31, 2018, compared with $173 million, representing 0.05% of total general fund invested assets as at December 31, 2017.

If a counterparty fails to fulfill its obligations we may be exposed to risks we had sought to mitigate.

- The Company uses derivative financial instruments to mitigate exposures to public equity, foreign currency, interest rate and other market risks arising from on-balance sheet financial instruments, guarantees related to variable annuity products, selected anticipated transactions and certain other guarantees. The Company may be exposed to counterparty risk if a counterparty fails to pay amounts owed to us or otherwise perform its obligations to us. Counterparty risk increases during economic downturns because the probability of default increases for most counterparties. If any of these counterparties default, we may not be able to recover the amounts due from that counterparty. As at December 31, 2018, the largest single counterparty exposure without taking into account the impact of master netting agreements or the benefit of collateral held, was $2,269 million (2017 – $2,629 million). The net exposure to this counterparty, after taking into account 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 taking into account the impact of master netting agreements and the benefit of collateral held, was $14,320 million (2017 – $16,204 million) compared with $245 million after taking into account master netting agreements and the benefit of fair value of collateral held (2017 – $95 million). The exposure to any counterparty would grow if, upon the counterparty's default, markets moved such that our derivatives with that counterparty gain in value. Until we are able to replace that derivative with another counterparty, the gain on the derivatives subsequent to the counterparty's default would not be backed by collateral. The Company reinsures a portion of the business we enter into; however, we remain legally liable for contracts that we had reinsured. In the event that any of our reinsurance providers were unable or unwilling to fulfill their contractual obligations related to the liabilities we cede to them, we would need to increase actuarial reserves, adversely impacting our net income attributed to shareholders and capital position. In addition, the Company has over time sold certain blocks of business to third-party purchasers using reinsurance. To the extent that the reinsured contracts are not subsequently novated to the purchasers, we remain legally liable to the insureds. Should the purchasers be unable or unwilling to fulfill their contractual obligations under the reinsurance agreement, we would need to increase policy liabilities resulting in a charge to net income attributed to shareholders. To reduce credit risk, the Company may require purchasers to provide collateral for their reinsurance liabilities.
- We participate in a securities lending program whereby blocks of securities are loaned to third parties, primarily major brokerage firms and commercial banks. Collateral, which exceeds the market value of the loaned securities, is retained by the Company until the underlying security has been returned. If any of our securities lending counterparties default and the value of the collateral is insufficient, we would incur losses. As at December 31, 2018, the Company had loaned securities (which are included in invested assets) valued at approximately $1,518 million, compared with $1,563 million at December 31, 2017.

The determination of allowances and impairments on our investments is subjective and changes could materially impact our results of operations or financial position.

- The determination of allowances and impairments is based upon a periodic evaluation of known and inherent risks associated with the respective security. Management considers a wide range of factors about the security and uses its best judgment in evaluating the cause of the decline, in estimating the appropriate value for the security and in assessing the prospects for near-term recovery. Inherent in management's evaluation of the security are assumptions and estimates about the operations of the issuer and its future earnings potential. Considerations in the impairment evaluation process include: (i) the severity of the impairment; (ii) the length of time and the extent to which the market value of a security has been below its carrying value; (iii) the financial condition of the issuer; (iv) the potential for impairments in an entire industry sector or sub-sector; (v) the potential for impairments in certain economically depressed geographic locations; (vi) the potential for impairments of securities where the issuer, series of issuers or industry has suffered a catastrophic type of loss or has exhausted natural resources; (vii) our ability and intent to hold the security for a period of time sufficient to allow for the recovery of its value to an amount equal to or greater than cost or amortized cost; (viii) unfavourable changes in forecasted cash flows on mortgage-backed and asset-backed securities; and (ix) other subjective factors, including concentrations and information obtained from regulators and rating agencies.
- Such evaluations and assessments are revised as conditions change and new information becomes available. We update our evaluations regularly and reflect changes in allowances and impairments as such evaluations warrant. The evaluations are inherently subjective and incorporate only those risk factors known to us at the time the evaluation is made. There can be no assurance that management has accurately assessed the level of impairments that have occurred. Additional impairments will likely need to be taken or allowances provided for in the future as conditions evolve. Historical trends may not be indicative of future impairments or allowances.

Product Risk Factors

We make a variety of assumptions related to the future level of claims, policyholder behaviour, expenses, reinsurance costs and sales levels when we design and price products, and when we establish 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. Assumptions for future policyholder behaviour include assumptions related to the retention rates for insurance and wealth products. Assumptions for expenses include assumptions related to future maintenance expense levels and volume of the business.

Losses may result should actual experience be materially different than that assumed in the valuation of policy liabilities.

- Such losses could have a significant adverse effect on our results of operations and financial condition. In addition, we periodically review the assumptions we make in determining our policy liabilities and the review may result in an increase in policy liabilities and a decrease in net income attributed to shareholders. Such assumptions require significant professional judgment, and actual experience may be materially different than the assumptions we make. (See “Critical Actuarial and Accounting Policies” above.)

We may be unable to implement necessary price increases on ourin-force businesses or may face delays in implementation.

- We continue to seek state regulatory approvals for price increases on existing long-term care business in the United States. We cannot be certain whether or when each approval will be granted. For some in-force business regulatory approval for price increases may not be required. However, regulators or policyholders may nonetheless seek to challenge our authority to implement such increases. Our policy liabilities reflect our estimates of the impact of these price increases, but should we be less successful than anticipated in obtaining them, then policy liabilities could increase accordingly and reduce net income attributed to shareholders.

Evolving legislation related to genetic testing could adversely impact our underwriting abilities.

- Current or future legislation in jurisdictions where Manulife operates may restrict its right to underwrite based on access to genetic test results. Without the obligation of disclosure, the asymmetry of information shared between applicant and insurer could increase anti-selection in both new business and in-force policyholder behaviour. The impact of restricting insurers’ access to this information and the associated problems of anti-selection becomes more acute where genetic technology leads to advancements in diagnosis of life-threatening conditions that are not matched by improvements in treatment. We cannot predict the potential financial impact that this would have on the Company or the industry as a whole. In addition, there may be further unforeseen implications as genetic testing continues to evolve and becomes more established in mainstream medical practice.

Life and health insurance 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.

- The cost of health insurance benefits may be impacted by unforeseen trends in the incidence, termination and severity rates of claims. The ultimate level of lifetime benefits paid to policyholders may be increased by an unexpected increase in life expectancy. For example, advances in technology could lead to longer lives through better medical treatment or better disease prevention. 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. For example, a weak or declining economic environment could increase the value of guarantees associated with variable annuities or other embedded guarantees and contribute to adverse policyholder behaviour experience, or a rapid rise in interest rates could increase the attractiveness of alternatives for customers holding products that offer contractual surrender benefits that are not market value adjusted, which could also contribute to adverse policyholder behaviour experience. As well, adverse claims experience could result from systematic anti-selection, which could arise from the development of investor owned and secondary markets for life insurance policies, anti-selective lapse behaviour, underwriting process failures, anti-selective policyholder behaviour due to greater consumer accessibility to home-based medical screening, or other factors.

External market conditions determine the availability, terms and cost of reinsurance protection which could impact our financial position and our ability to write new policies.

- As part of our overall risk and capital management strategy, we purchase reinsurance protection on certain risks underwritten or assumed by our various insurance businesses. As the global reinsurance industry continues to review and optimize their business models, certain of our reinsurers have attempted to increase rates on our existing reinsurance contracts. The ability of our reinsurers to increase rates depends upon the terms of each reinsurance contract. Typically, the reinsurer’s ability to raise rates is restricted by a number of terms in our reinsurance contracts, which we seek to enforce. We believe our reinsurance provisions are appropriate at December 31, 2018; however, there can be no assurance regarding the impact of future rate increase actions taken by our reinsurers. Accordingly, future rate increase actions by our reinsurers could result in accounting charges, an increase in the cost of reinsurance, and the assumption of more risk on business already reinsured.
- In addition, an increase in the cost of reinsurance could also adversely affect our ability to write future business or result in the assumption of more risk with respect to policies we issue. Premium rates charged on new policies we write are based, in part, on the assumption that reinsurance will be available at a certain cost. Certain reinsurers may attempt to increase the rates they charge us for new policies we write, and for competitive reasons, we may not be able to raise the premium rates we charge for newly written policies to offset the increase in reinsurance rates. If the cost of reinsurance were to increase, if reinsurance were to become unavailable, and if alternatives to reinsurance were not available, our ability to write new policies at competitive premium rates could be adversely affected.

Operational Risk Factors

Operational risk is naturally present in all of our business activities and encompasses a broad range of risks, including regulatory compliance failures, legal disputes, technology failures, business interruption, information security and privacy breaches, human resource management failures, processing errors, modelling errors, business integration, theft and fraud, and damage to physical assets. Exposures can take the form of financial losses, regulatory sanctions, loss of competitive positioning, or damage to our reputation. Operational risk is also embedded in all the practices we use to manage other risks; therefore, if not managed effectively, operational risk can impact our ability to manage other key risks such as credit risk, market risk, liquidity risk and insurance risk.

Adverse publicity, litigation or regulatory action resulting from our business practices or actions by our employees, representatives and/or business partners, could erode our corporate image and damage our franchise value and/or create losses.

- Manulife's reputation is one of its most valuable assets. Harm to a company's reputation is often a consequence of risk control failure, whether associated with complex financial transactions or relatively routine operational activities. Manulife's reputation could also be harmed by the actions of third parties with whom we do business. Our representatives include affiliated broker-dealers, agents, wholesalers and independent distributors, such as broker-dealers and banks, whose services and representations our customers rely on. Business partners include, among others, third parties to whom we outsource certain functions and that we rely on to fulfill various obligations.
- If any of these representatives or business partners fail to adequately perform their responsibilities, or monitor its own risk, these failures could affect our business reputation and operations. While we seek to maintain adequate internal risk management policies and procedures and protect against performance failures, events may occur that could cause us to lose customers or suffer legal or regulatory sanctions, which could have a material adverse effect on our reputation, our business, and our results of operations. For further discussion of government regulation and legal proceedings refer to "Government Regulation" in MFC's Annual Information Form dated February 13, 2019 and note 18 of the 2018 Annual Consolidated Financial Statements.

If we are not able to attract, motivate and retain agency leaders and individual agents, our competitive position, growth and profitability will suffer.

- We must attract and retain sales representatives to sell our products. Strong competition exists among financial services companies for efficient and effective sales representatives. We compete with other financial services companies for sales representatives primarily on the basis of our financial position, brand, support services and compensation and product features. Any of these factors could change either because we change the Company or our products, or because our competitors change theirs and we are unable or unwilling to adapt. If we are unable to attract and retain sufficient sales representatives to sell our products, our ability to compete and revenues from new sales would suffer, which could have a material adverse effect on our business, results of operations and financial condition.

If we are unable to complete key projects on time, on budget, and capture planned benefits, our business strategies and plans, and operations may be impaired.

- We must successfully deliver a number of key projects in order to implement our business strategies and plans. If we are unable to complete these projects in accordance with planned schedules, and to capture projected benefits, there could be a material adverse effect on our business and financial condition.

The interconnectedness of our operations and risk management strategies could expose us to risk if all factors are not appropriately considered and communicated.

- Our business operations, including strategies and operations related to risk management, asset liability management and liquidity management, are interconnected and increasingly complex. Changes in one area may have a secondary impact in another area of our operations. For example, risk management actions, such as the increased use of interest rate swaps, could have implications for the Company's Global Wealth and Asset Management Segment or its Treasury function, as this strategy could result in the need to post additional amounts of collateral. Failure to appropriately consider these inter-relationships, or effectively communicate changes in strategies or activities across our operations, could have a negative impact on the strategic objectives or operations of another group. Further, failure to consider these inter-relationships in our modeling and financial and strategic decision-making processes could have a negative impact on our operations.

Our risk management policies, procedures and strategies may leave us exposed to unidentified or unanticipated risks, which could negatively affect our business, results of operations and financial condition.

- We have devoted significant resources to develop our risk management policies, procedures and strategies and expect to continue to do so in the future. Nonetheless, there is a risk that our policies, procedures and strategies may not be comprehensive. Many of our methods for measuring and managing risk and exposures are based upon the use of observed historical market behaviour or statistics based on historical models. Future behaviour may be very different from past behaviour, especially if there are some fundamental changes that affect future behaviour. As an example, the increased occurrence of negative interest rates can make it difficult to model future interest rates as interest rate models have been generally developed for an environment of positive interest rates. As a result, these methods may not fully predict future exposures, which can be significantly greater than our historical measures indicate. Other risk management methods depend upon the evaluation and/or reporting of information regarding markets, clients, client transactions, catastrophe occurrence or other matters publicly available or otherwise accessible to us. This information may not always be accurate, complete, up-to-date or properly evaluated or reported.

We are subject to tax audits, tax litigation or similar proceedings, and as a result we may owe additional taxes, interest and penalties in amounts that may be material.

- We are subject to income and other taxes in the jurisdictions in which we do business. In determining our provisions for income taxes and our accounting for tax-related matters in general, we are required to exercise judgment. We regularly make estimates where the ultimate tax determination is uncertain. There can be no assurance that the final determination of any tax audit, appeal of the decision of a taxing authority, tax litigation or similar proceedings will not be materially different from that reflected in our historical financial statements. The assessment of additional taxes, interest and penalties could be materially adverse to our current and future results of operations and financial condition.

Our non-North American operations face political, legal, operational and other risks that could negatively affect those operations or our results of operations and financial condition.

- A substantial portion of our revenue and net income attributed to shareholders is derived from our operations outside of North America, primarily in key Asian markets. Some of these key geographical markets are developing and are rapidly growing countries and markets that present unique risks that we do not face, or are negligible, in our operations in Canada or the U.S. Our operations outside of North America face the risk of discriminatory regulation, political and economic instability, market volatility and significant inflation, limited protection for, or increased costs to protect intellectual property rights, inability to protect and/or enforce contractual or legal rights, nationalization or expropriation of assets, price controls and exchange controls or other restrictions that prevent us from transferring funds from these operations out of the countries in which they operate or converting local currencies we hold into Canadian or U.S. dollars. Failure to manage these risks could have a significant negative impact on our operations and profitability.
- We are currently planning to expand our global operations in markets where we operate and potentially in new markets. This may require considerable management time, as well as start-up expenses for market development before any significant revenues and earnings are generated. Operations in new foreign markets may achieve low margins or may be unprofitable, and expansion in existing markets may be affected by local economic and market conditions.

We are regularly involved in litigation.

- We are regularly involved in litigation, either as a plaintiff or defendant. These cases could result in an unfavourable resolution and could have a material adverse effect on our results of operations and financial condition. For further discussion of legal proceedings refer to note 18 of the 2018 Annual Consolidated Financial Statements.

We are exposed to investors trying to profit from short positions in our stock.

- Short sellers seek to profit from a decline in the price of our common shares. Through their actions and public statements, they may encourage the decline in price from which they profit and may encourage others to take short positions in our shares. The existence of such short positions and the related publicity may lead to continued volatility in our common share price.

System failures or events that impact our facilities may disrupt business operations.

- Technology is used in virtually all aspects of our business and operations; in addition, part of our strategy involves the expansion of technology to directly serve our customers. An interruption in the service of our technology resulting from system failure, cyber-attack, human error, natural disaster, man-made disaster, pandemic, or other unpredictable event beyond reasonable control could prevent us from effectively operating our business.
- While our facilities and operations are distributed across the globe, we can experience extreme weather, natural disasters, civil unrestman-made disasters, power outages, pandemic, and other events which can prevent access to, and operations within, the facilities for our employees, partners, and other parties that support our business operations.
- We take measures to plan, structure and protect against routine events that may impact our operations, and maintain plans to recover from unpredictable events. An interruption to our operations may subject us to regulatory sanctions and legal claims, lead to a loss of customers, assets and revenues, result in unauthorized disclosures of personal or confidential information, or otherwise adversely affect us from a financial, operational and reputational perspective.

An information security or privacy breach of our operations or of a related third party could adversely impact our business, results of operations, financial condition, and reputation.

- It is possible that the Company may not be able to anticipate or to implement effective preventive measures against all disruptions or privacy and security breaches, especially because the techniques used change frequently, generally increase in sophistication, often are not recognized until launched, and because cyber-attacks can originate from a wide variety of sources, including organized crime, hackers, terrorists, activists, and other external parties, including parties sponsored by hostile foreign governments. Those parties may also attempt to fraudulently induce employees, customers, and other users of the Company's systems or third-party service providers to disclose sensitive information in order to gain access to the Company's data or that of its customers or clients. We, our customers, regulators and other third parties have been subject to, and are likely to continue to be the target of, cyber-attacks, including computer viruses, malicious or destructive code, phishing attacks, denial of service and other security incidents, that could result in the unauthorized release, gathering, monitoring, misuse, loss or destruction of personal, confidential, proprietary and other information of the Company, our employees, our customers or of third parties, or otherwise materially disrupt our or our customers' or other third parties' network access or business operations. These attacks could adversely impact us from a financial, operational and reputational perspective.

- The Company has an Information Risk Management Program, which includes information and cyber security defenses, to protect our networks and systems from attacks; however, there can be no assurance that these counter measures will be successful in every instance in protecting our networks against advanced attacks. In addition to protection, detection and response mechanisms, the Company maintains cyber risk insurance, but this insurance may not cover all costs associated with the financial, operational and reputational consequences of personal, confidential or proprietary information being compromised.

Competition for the best people is intense and an inability to recruit qualified individuals may negatively impact our ability to execute on business strategies or to conduct our operations.

- We compete with other insurance companies and financial institutions for qualified executives, employees and agents. We must attract and retain top talent to maintain our competitive advantage. Failure to attract and retain the best people could adversely impact our business.

Model risk may arise from the inappropriate use or interpretation of models or their output, or the use of deficient models, data or assumptions.

- We are relying on some highly complex models for pricing, valuation and risk measurement, and for input to decision making. Consequently, the risk of inappropriate use or interpretation of our models or their output, or the use of deficient models, could have a material adverse effect on our business.
- We are continuing to enhance our valuation models and processes across the organization. We do not expect this initiative to result in significant reserve adjustments. However, as we systematically review our models, there could be updates to our assumptions and methodologies that result in reserve changes.

Fraud risks may arise from incidents related to identity theft and account takeovers.

- Policies and procedures are in place to prevent and detect fraud incidents; however, our existing control environment may not be able to mitigate all possible incidents, which could adversely impact our business, results of operations, financial condition, and reputation. Policies and procedures are being reviewed to enhance our capabilities to better protect against more sophisticated fraud threats, but we may nevertheless not be able to mitigate all possible incidents.

Environmental risk may arise related to our commercial mortgage loan portfolio and owned property or from our business operations.

- Environmental risk may originate from investment properties that are subject to natural orman-made environmental risk. Real estate assets may be owned, leased and/or managed, as well as mortgaged by Manulife and we might enter into the chain of liability due to foreclosure ownership when in default.
- Liability under environmental protection laws resulting from our commercial mortgage loan portfolio and owned property (including commercial real estate, oil and gas, timberland and farmland properties) may adversely impact our reputation, results of operations and financial condition. Under applicable laws, contamination of a property with hazardous materials or substances may give rise to a lien on the property to secure recovery of the costs of cleanup. In some instances, this lien has priority over the lien of an existing mortgage encumbering the property. The environmental risk may result from on-site or off-site (adjacent) due to migration of regulated pollutants or contaminates with financial or reputational environmental risk and liability consequences by virtue of strict liability. Environmental risk could also arise from natural disasters (e.g., climate change, weather, fire, earthquake, floods, pests) or human activities (use of chemicals, pesticides) conducted within the site or when impacted from adjacent sites.
- Additionally, as lender, we may incur environmental liability (including without limitation liability forclean-up, remediation and damages incurred by third parties) similar to that of an owner or operator of the property, if we or our agents exercise sufficient control over the operations at the property. We may also have liability as the owner and/or operator of real estate for environmental conditions or contamination that exist or occur on the property, or affecting other property.
- In addition, failure to adequately prepare for the potential impacts of climate change may have a negative impact on our financial position or our ability to operate. Potential impacts may be direct or indirect and may include business losses or disruption resulting from extreme weather conditions; the impact of changes in legal or regulatory framework made to address climate change; or increased mortality or morbidity resulting from environmental damage or climate change.

Additional Risk Factors That May Affect Future Results

- Other factors that may affect future results include changes in government trade policy, monetary policy or fiscal policy; political conditions and developments in or affecting the countries in which we operate; technological changes; public infrastructure disruptions; changes in consumer spending and saving habits; the possible impact on local, national or global economies from public health emergencies, such as an influenza pandemic, and international conflicts and other developments including those relating to terrorist activities. Although we take steps to anticipate and minimize risks in general, unforeseen future events may have a negative impact on our business, financial condition and results of operations.

We caution that the preceding discussion of risks that may affect future results is not exhaustive. When relying on our forward-looking statements to make decisions with respect to our Company, investors and others should carefully consider the foregoing risks, as well as other uncertainties and potential events, and other external and Company specific risks that may adversely affect the future business, financial condition or results of operations of our Company.

Controls and Procedures

Disclosure Controls and Procedures

Our disclosure controls and procedures are designed to provide reasonable assurance that information required to be disclosed by us is recorded, processed, summarized, and reported accurately and completely and within the time periods specified under Canadian and U.S. securities laws. Our process includes controls and procedures that are designed to ensure that information is accumulated and communicated to management, including the CEO and CFO, to allow timely decisions regarding required disclosure.

As of December 31, 2018, management evaluated the effectiveness of its disclosure controls and procedures as defined under the rules adopted by the U.S. Securities and Exchange Commission and the Canadian securities regulatory authorities. This evaluation was performed under the supervision of the Audit Committee, the CEO and CFO. Based on that evaluation, the CEO and CFO concluded that our disclosure controls and procedures were effective as at December 31, 2018.

MFC's Audit Committee has reviewed this MD&A and the 2018 Consolidated Financial Statements and MFC's Board of Directors approved these reports prior to their release.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting. The Company's internal control system was designed to provide reasonable assurance to management and the Board of Directors regarding the preparation and fair presentation of published financial statements in accordance with generally accepted accounting principles. All internal control systems, no matter how well designed, have inherent limitations due to manual controls. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation.

Management maintains a comprehensive system of controls intended to ensure that transactions are executed in accordance with management's authorization, assets are safeguarded, and financial records are reliable. Management also takes steps to ensure that information and communication flows are effective and to monitor performance, including performance of internal control procedures.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2018 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission 2013 framework in Internal Control – Integrated Framework. Based on this assessment, management believes that, as of December 31, 2018, the Company's internal control over financial reporting is effective.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2018 has been audited by Ernst & Young LLP, the Company's independent registered public accounting firm that also audited the Consolidated Financial Statements of the Company for the year ended December 31, 2018. Their report expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2018.

Changes in Internal Control over Financial Reporting

No changes were made in our internal control over financial reporting during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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Performance and Non-GAAP Measures

We use a number of non-GAAP financial measures to measure overall performance and to assess each of our businesses. A financial measure is considered a non-GAAP measure for Canadian securities law purposes if it is presented other than in accordance with generally accepted accounting principles used for the Company's audited financial statements. Non-GAAP measures include: core earnings (loss); core ROE; diluted core earnings per common share; core earnings before income taxes, depreciation and amortization ("core EBITDA"); core EBITDA margin; core investment gains, constant exchange rate basis (measures that are reported on a constant exchange rate basis include percentage growth/decline in core earnings, sales, APE sales, gross flows, core EBITDA, new business value ("NBV"), new business value margin, assets under management, and assets under management and administration ("AUMA")); assets under administration; expense efficiency ratio; assets under management and administration; assets under management; consolidated capital; embedded value; new business value; new business value margin; sales; APE sales; gross flows; and net flows. Non-GAAP financial measures are not defined terms under GAAP and, therefore, are unlikely to be comparable to similar terms used by other issuers. Therefore, they should not be considered in isolation or as a substitute for any other financial information prepared in accordance with GAAP.

Effective January 1, 2018, the Company's reporting segments have been reorganized as outlined under the "Manulife Financial Corporation" section at the beginning of the MD&A. In addition, we made the following adjustments to our reporting:

- The definition of the Global Wealth and Asset Management business now includes the Guaranteed Interest Account portion of the Canadian Pension defined contribution business;
- The NBV calculation has been refined for our Canadian segregated fund guarantee business; and
- The calculation of net flows and AUMA now includes the sale ofnon-proprietary products in Canada.

Core earnings (loss) is a non-GAAP measure which we believe aids investors in better understanding the long-term earnings capacity and valuation of the business. Core earnings allows investors to focus on the Company's operating performance by excluding the direct impact of changes in equity markets and interest rates, changes in actuarial methods and assumptions as well as a number of other items, outlined below, that we believe are material, but do not reflect the underlying earnings capacity of the business. For example, due to the long-term nature of our business, the mark-to-market movements of equity markets, interest rates, foreign currency exchange rates and commodity prices from period-to-period can, and frequently do, have a substantial impact on the reported amounts of our assets, liabilities and net income attributed to shareholders. These reported amounts are not actually realized at the time and may never be realized if the markets move in the opposite direction in a subsequent period. This makes it very difficult for investors to evaluate how our businesses are performing from period-to-period and to compare our performance with other issuers.

We believe that core earnings better reflect the underlying earnings capacity and valuation of our business. We use core earnings as the basis for management planning and reporting and, along with net income attributed to shareholders, as a key metric used in our short and mid-term incentive plans at the total Company and operating segment level.

While core earnings is relevant to how we manage our business and offers a consistent methodology, it is not insulated from macro-economic factors which can have a significant impact. See "Quarterly Financial Information" below for reconciliation of core earnings to net income attributed to shareholders.

Any future changes to the core earnings definition referred to below, will be disclosed.

Items included in core earnings:

1. Expected earnings on in-force policies, including expected release of provisions for adverse deviation, fee income, margins on group business and spread business such as Manulife Bank and asset fund management.
2. Macro hedging costs based on expected market returns.
3. New business strain and gains.
4. Policyholder experience gains or losses.
5. Acquisition and operating expenses compared with expense assumptions used in the measurement of policy liabilities.
6. Up to $400 million of net favourable investment-related experience reported in a single year, which are referred to as "core investment gains". This means up to $100 million in the first quarter, up to $200 million on a year-to-date basis in the second quarter, up to $300 million on ayear-to-date basis in the third quarter and up to $400 million on a full year basis in the fourth quarter. Any investment-related experience losses reported in a quarter will be offset against the net year-to-date investment-related experience gains with the difference being included in core earnings subject to a maximum of the year-to-date core investment gains and a minimum of zero, which reflects our expectation that investment-related experience will be positive through-the-business cycle. To the extent any investment-related experience losses cannot be fully offset in a quarter they will be carried forward to be offset against investment-related experience gains in subsequent quarters in the same year, for purposes of determining core investment gains. Investment-related experience relates to fixed income investing, ALDA returns, credit experience and asset mix changes other than those related to a strategic change. An example of a strategic asset mix change is outlined below.
    - This favourable and unfavourable investment-related experience is a combination of reported investment experience as well as the impact of investing activities on the measurement of our policy liabilities. We do not attribute specific components of investment-related experience to amounts included or excluded from core earnings.

- The $400 million threshold represents the estimated average annualized amount of net favourable investment-related experience that the Company reasonably expects to achieve through-the-business cycle based on historical experience. It is not a forecast of expected net favourable investment-related experience for any given fiscal year.
- Our average net annualized investment-related experience calculated from the introduction of core earnings in 2012 to the end of 2018 was $493 million (2012 to the end of 2017 was $475 million).
- The decision announced on December 22, 2017 to reduce the allocation to ALDA in the portfolio asset mix supporting our legacy businesses was the first strategic asset mix change since we introduced the core earnings metric in 2012. We refined our description of investment-related experience in 2017 to note that asset mix changes other than those related to a strategic change are taken into consideration in the investment-related experience component of core investment gains.
- While historical investment return time horizons may vary in length based on underlying asset classes generally exceeding 20 years, for purposes of establishing the threshold, we look at a business cycle that is five or more years and includes a recession. We monitor the appropriateness of the threshold as part of our annual five-year planning process and would adjust it, either to a higher or lower amount, in the future if we believed that our threshold was no longer appropriate.
- Specific criteria used for evaluating a potential adjustment to the threshold may include, but are not limited to, the extent to which actual investment-related experience differs materially from actuarial assumptions used in measuring insurance contract liabilities, material market events, material dispositions or acquisitions of assets, and regulatory or accounting changes.

7. Earnings on surplus other than mark-to-market items. Gains on available-for-sale (“AFS”) equities and seed money investments included in new segregated and mutual funds are included in core earnings.
8. Routine or non-material legal settlements.
9. All other items not specifically excluded.
10. Tax on the above items.
11. All tax related items except the impact of enacted or substantively enacted income tax rate changes.

Items excluded from core earnings:

1. The direct impact of equity markets and interest rates and variable annuity guarantee liabilities includes the items listed below.
   - The earnings impact of the difference between the net increase (decrease) in variable annuity liabilities that are dynamically hedged and the performance of the related hedge assets. Our variable annuity dynamic hedging strategy is not designed to completely offset the sensitivity of insurance and investment contract liabilities to all risks or measurements associated with the guarantees embedded in these products for a number of reasons, including; provisions for adverse deviation, fund performance, the portion of the interest rate risk that is not dynamically hedged, realized equity and interest rate volatilities and changes to policyholder behaviour.
   - Gains (charges) on variable annuity guarantee liabilities not dynamically hedged.
   - Gains (charges) on general fund equity investments supporting policy liabilities and on fee income.
   - Gains (charges) on macro equity hedges relative to expected costs. The expected cost of macro hedges is calculated using the equity assumptions used in the valuation of insurance and investment contract liabilities.
   - Gains (charges) on higher (lower) fixed income reinvestment rates assumed in the valuation of insurance and investment contract liabilities.
   - Gains (charges) on sale of AFS bonds and open derivatives not in hedging relationships in the Corporate and Other segment.
2. Net favourable investment-related experience in excess of $400 million per annum or net unfavourable investment-related experience on a year-to-date basis.
3. Mark-to-market gains or losses on assets held in the Corporate and Other segment other than gains on AFS equities and seed money investments in new segregated or mutual funds.
4. Changes in actuarial methods and assumptions. As noted in the “Critical Actuarial and Accounting Policies” section above, policy liabilities for IFRS are valued in Canada under standards established by the Actuarial Standards Board. The standards require a comprehensive review of actuarial methods and assumptions to be performed annually. The review is designed to reduce the Company’s exposure to uncertainty by ensuring assumptions for both asset related and liability related risks remain appropriate and is accomplished by monitoring experience and selecting assumptions which represent a current best estimate view of expected future experience, and margins that are appropriate for the risks assumed. By excluding the results of the annual reviews, core earnings assist investors in evaluating our operational performance and comparing our operational performance from period to period with other global insurance companies because the associated gain or loss is not reflective of current year performance and not reported in net income in most actuarial standards outside of Canada.
5. The impact on the measurement of policy liabilities of changes in product features or new reinsurance transactions, if material.
6. Goodwill impairment charges.
7. Gains or losses on disposition of a business.
8. Material one-time only adjustments, including highly unusual/extraordinary and material legal settlements or other items that are material and exceptional in nature.
9. Tax on the above items.
10. Impact of enacted or substantially enacted income tax rate changes.

Core return on common shareholders’ equity (“core ROE”) is a non-GAAP profitability measure that presents core earnings available to common shareholders as a percentage of the capital deployed to earn the core earnings. The Company calculates core ROE using average common shareholders’ equity.

Diluted core earnings per common share is core earnings available to common shareholders expressed per diluted weighted average common share outstanding.

The Company also uses financial performance measures that are prepared on a **constant exchange rate basis**, which are non-GAAP measures that exclude the impact of currency fluctuations (from local currency to Canadian dollars at a total Company level and from local currency to U.S. dollars in Asia). Amounts stated on a constant exchange rate basis in this report are calculated, as appropriate, using the income statement and balance sheet exchange rates effective for the fourth quarter of 2018. Measures that are reported on a constant exchange rate basis include growth in core earnings, sales, APE sales, gross flows, core EBITDA, new business value, new business value margin, assets under management, and assets under management and administration.

Assets under management and administration ("AUMA") is a non-GAAP measure of the size of the Company. It is comprised of the non-GAAP measures assets under management ("AUM"), which includes both assets of general account and external client assets for which we provide investment management services, and assets under administration ("AUA"), which includes assets for which we provide administrative services only. Assets under management and administration is a common industry metric for WAM businesses.

Assets under management and administration

As at December 31, ($ millions)	2018	2017
Total invested assets	**$ 353,664**	$ 334,222
Segregated funds net assets	**313,209**	324,307
Assets under management per financial statements	**666,873**	658,529
Mutual funds	**182,219**	191,507
Institutional advisory accounts (excluding segregated funds)	**102,323**	91,115
Other funds	**7,658**	6,937
Total assets under management	**959,073**	948,088
Other assets under administration	**124,449**	123,188
Currency impact	**–**	66,011
AUMA at constant exchange rates	**$ 1,083,522**	$ 1,137,287

Consolidated capital The definition we use for consolidated capital, a non-GAAP measure, serves as a foundation of our capital management activities at the MFC level. For regulatory reporting purposes, the numbers are further adjusted for various additions or deductions to capital as mandated by the guidelines used by OSFI. Consolidated capital is calculated as the sum of: (i) total equity excluding accumulated other comprehensive income ("AOCI") on cash flow hedges; and (ii) liabilities for capital instruments.

Consolidated capital

As at December 31, ($ millions)	2018	2017
Total equity	**$ 47,151**	$ 42,163
Add AOCI loss on cash flow hedges	**127**	109
Add qualifying capital instruments	**8,732**	8,387
Consolidated capital	**$ 56,010**	$ 50,659

Core EBITDA is a non-GAAP measure which Manulife uses to better understand the long-term earnings capacity and valuation of the business on a basis more comparable to how the profitability of global asset managers is generally measured. Core EBITDA presents core earnings before the impact of interest, taxes, depreciation, and amortization. Core EBITDA excludes certain acquisition expenses related to insurance contracts in our retirement businesses which are deferred and amortized over the expected life time of the customer relationship under the CALM. Core EBITDA was selected as a key performance indicator for WAM businesses, as EBITDA is widely used among asset management peers, and core earnings is a primary profitability metric for the Company overall.

Core EBITDA margin is a non-GAAP measure which Manulife uses to better understand the long-term profitability of our Global WAM business on a more comparable basis to how profitability of global asset managers are measured. Core EBITDA margin presents core earnings before the impact of interest, taxes, depreciation, and amortization divided by total revenue from these businesses. Core EBITDA margin was selected as a key performance indicator for our Global WAM business, as EBITDA margin is widely used among asset management peers, and core earnings is a primary profitability metric for the Company overall.

Global Wealth and Asset Management

For the years ended December 31, ($ millions)	2018	2017
Core EBITDA	**$ 1,498**	$ 1,426
Amortization of deferred acquisition costs and other depreciation	**(301)**	(344)
Amortization of deferred sales commissions	**(98)**	(99)
Core earnings before income taxes	**1,099**	983
Core income tax (expense) recovery	**(113)**	(167)
Core earnings	**$ 986**	$ 816

Expense efficiency ratio is a non-GAAP measure which Manulife uses to measure progress towards our target to be more efficient. Efficiency ratio is defined as pre-tax general expenses included in core earnings divided by the sum ofpre-tax core earnings and pre-tax general expenses included in core earnings.

Embedded value ("EV") is a measure of the present value of shareholders' interests in the expected future distributable earnings onin-force business reflected in the Consolidated Statements of Financial Position of Manulife, excluding any value associated with future new business. EV is calculated as the sum of the adjusted net worth and the value of in-force business. The adjusted net worth is the IFRS shareholders' equity adjusted for goodwill and intangibles, fair value of surplus assets, the carrying value of debt and preferred shares, and local statutory balance sheet, regulatory reserve, and capital for Manulife's Asian business. The value of in-force business in Canada and the U.S. is the present value of expected future IFRS earnings onin-force business less the present value of the cost of holding capital to support the in-force business under the MCCSR framework. The MCCSR framework was replaced by the LICAT framework on January 1, 2018 and LICAT was used to calculate EV as at December 31, 2018. It has been used to calculate quarterly NBV starting January 1, 2018. The value of in-force business in Asia reflects local statutory earnings and capital requirements. The value of in-force excludes our Global WAM, Manulife Bank and Property and Casualty Reinsurance businesses.

New business value ("NBV") is the change in embedded value as a result of sales in the reporting period. NBV is calculated as the present value of shareholders' interests in expected future distributable earnings, after the cost of capital, on actual new business sold in the period using assumptions that are consistent with the assumptions used in the calculation of embedded value. NBV excludes businesses with immaterial insurance risks, such as the Company's Global WAM, Manulife Bank and the short-term Property and Casualty Reinsurance businesses. NBV is a useful metric to evaluate the value created by the Company's new business franchise.

New business value margin is calculated as NBV divided by APE excluding non-controlling interests. APE is calculated as 100% of annualized first year premiums for recurring premium products, and as 10% of single premiums for single premium products. Both NBV and APE used in the NBV margin calculation are after non-controlling interests and exclude our Global WAM, Manulife Bank and Property and Casualty Reinsurance businesses. The NBV margin is a useful metric to help understand the profitability of our new business.

Sales are measured according to product type:
For individual insurance, sales include 100% of new annualized premiums and 10% of both excess and single premiums. For individual insurance, new annualized premiums reflect the annualized premium expected in the first year of a policy that requires premium payments for more than one year. Single premium is the lump sum premium from the sale of a single premium product, e.g. travel insurance. Sales are reported gross before the impact of reinsurance.

For group insurance, sales include new annualized premiums and administrative services only premium equivalents on new cases, as well as the addition of new coverages and amendments to contracts, excluding rate increases.

APE sales is comprised of 100% of regular premiums/deposits and 10% of single premiums/deposits for both insurance and insurance-based wealth accumulation products.

Insurance-based wealth accumulation product sales include all new deposits into variable and fixed annuity contracts. As we discontinued sales of new Variable Annuity contracts in the U.S. in 1Q13, subsequent deposits into existing U.S. Variable Annuity contracts are not reported as sales. Asia variable annuity deposits are included in APE sales.

Bank new lending volumes include bank loans and mortgages authorized in the period.

Gross flows is a new business measure presented for our Global WAM business and includes all deposits into mutual funds, college savings 529 plans, group pension/retirement savings products, private wealth and institutional asset management products. Gross flows is a common industry metric for WAM businesses as it provides a measure of how successful the businesses are at attracting assets.

Net flows is presented for our Global WAM business and includes gross flows less redemptions for mutual funds, college savings 529 plans, group pension/retirement savings products, private wealth and institutional asset management products. Net flows is a common industry metric for WAM businesses as it provides a measure of how successful the businesses are at attracting and retaining assets.

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Additional Disclosures

Contractual Obligations

In the normal course of business, the Company enters into contracts that give rise to obligations fixed by agreement as to the timing and dollar amount of payment.

As at December 31, 2018, the Company's contractual obligations and commitments are as follows:

Payments due by period ($ millions)	Total	Less than 1 year	1 to 3 years	3 to 5 years	After 5 years
Long-term debt[1]	$ 8,672	$ 222	$ 1,093	$ 377	$ 6,980
Liabilities for capital instruments[1]	17,763	347	700	708	16,008
Investment commitments	10,372	4,434	3,092	1,789	1,057
Operating leases	575	129	203	93	150
Insurance contract liabilities[2]	788,422	9,327	10,863	17,994	750,238
Investment contract liabilities[1]	5,473	193	492	476	4,312
Deposits from Bank clients	19,684	15,351	2,147	2,185	1
Other	4,864	547	3,427	783	107
Total contractual obligations	$ 855,825	$ 30,550	$ 22,017	$ 25,405	$ 778,853

(1) The contractual payments include principal, interest and distributions. The contractual payments reflect the amounts payable from January 1, 2019 up to and including the final contractual maturity date. In the case of floating rate obligations, the floating rate index is based on the interest rates as at December 31, 2018 and is assumed to remain constant to the final contractual maturity date. The Company may have the contractual right to redeem or repay obligations prior to maturity and if such right is exercised, total contractual obligations paid and the timing of payment could vary significantly from the amounts and timing included in the table.

(2) Insurance contract liabilities 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 (see "Policy Liabilities"). Cash flows include embedded derivatives measured separately at fair value.

Legal and Regulatory Proceedings

We are regularly involved in legal actions, both as a defendant and as a plaintiff. Information on legal and regulatory proceedings can be found in note 18 of the 2018 Annual Consolidated Financial Statements.

Fourth Quarter Financial Highlights

Profitability

Profitability metrics

As at and for the quarters ended December 31, ($ millions, unless otherwise stated)	2018	2017	2016
Profitability:			
Net income attributed to shareholders	$ 593	$ (1,606)	$ 63
Core earnings[1],[2]	$ 1,337	$ 1,205	$ 1,287
Diluted earnings per common share ($)	$ 0.28	$ (0.83)	$ 0.01
Diluted core earnings per common share ($)[1]	$ 0.65	$ 0.59	$ 0.63
Return on common shareholders' equity ("ROE")	5.3%	(17.1)%	0.3%
Core ROE[1]	12.5%	12.1%	12.9%

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

(2) Impact of currency movement on the fourth quarter of 2018 ("4Q18") core earnings compared with the fourth quarter of 2017 ("4Q17") was a $36 million favourable variance.

Manulife's 4Q18 net income attributed to shareholders was $593 million compared with a loss of $1,606 million in 4Q17. Net income attributed to shareholders is comprised of core earnings (consisting of items we believe reflect the underlying earnings capacity of the business), which amounted to $1,337 million in 4Q18 compared with $1,205 million in 4Q17, and items excluded from core earnings, which netted to charges of $744 million in 4Q18 compared with charges of $2,811 million in 4Q17 for a period-over-period decrease in charges of $2,067 million. Net income attributed to shareholders in 4Q18 was higher than in 4Q17 due to the non-recurrence of a $2.8 billion post-tax charge in 4Q17 related to the impact of U.S. Tax Reform and the decision to change the portfolio asset mix supporting our legacy businesses, partially offset by the charges in 4Q18 related to the direct impact of equity markets.

The $132 million increase in core earnings compared with 4Q17 was primarily driven by new business growth in Asia, the impact of lower U.S. tax rates, improved policyholder experience, and greater expense efficiency, partially offset by the impact of lower equity markets on seed money investments in new segregated and mutual funds and fee income, and actions to optimize our portfolio. Core earnings in 4Q18 included net policyholder experience gains of $11 million post-tax ($13 million pre-tax) compared with charges of $34 million post-tax ($42 million pre-tax) in 4Q17.

Core earnings by segment is presented in the table below for the periods presented.

For the quarters ended December 31, ($ millions)	4Q18	4Q17
Core earnings[1]		
Asia	**$ 459**	$ 372
Canada	**312**	273
U.S.	**465**	463
Global Wealth and Asset Management	**231**	198
Corporate and Other (excluding core investment gains)	**(230)**	(201)
Core investment gains	**100**	100
Core earnings	**$ 1,337**	$ 1,205

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

In Asia, core earnings were $459 million in 4Q18 compared with $372 million in 4Q17. Core earnings in 4Q18 increased 20%, compared with 4Q17, after adjusting for the impact of changes in foreign currency exchange rates. The increase in core earnings was driven by growth in new business.

In Canada, core earnings were $312 million in 4Q18 compared with $273 million in 4Q17. Core earnings in 4Q18 increased 14%, compared with 4Q17. The increase in core earnings reflected improved policyholder experience in our group and individual insurance businesses, the favourable impact of new business from sales of the recently-launched Manulife Par product, and the non-recurrence of a number of smaller unfavourable items in the prior year.

In the U.S., core earnings were $465 million in 4Q18 compared with $463 million in 4Q17. Core earnings in 4Q18 decreased by 3% compared with 4Q17, including the impact of changes in foreign currency rates, due to the impact of markets on variable annuity core earnings, lower in-force earnings due to the reinsurance transactions and the non-recurrence of a number of smaller items in 2017, partially offset by the $67 million impact related to lower U.S. tax rates.

In Global Wealth and Asset Management core earnings were $231 million in 4Q18 compared with $198 million in 4Q17. Core earnings in 4Q18 increased 13%, compared with 4Q17. The increase in core earnings was driven primarily by the impact of lower U.S. tax rates. Core EBITDA was $362 million in 4Q18, which was in line with 4Q17.

Corporate and Other core loss excluding core investment gains was $230 million in 4Q18 compared with $201 million in 4Q17. The $29 million unfavourable variance in core earnings was primarily driven by the impact of markets, in 4Q18, on seed money investments in new segregated and mutual funds and the unfavourable impact of lower U.S. tax rates, partially offset by higher investment-related income, lower expenses, lower withholding taxes on future U.S. remittances and release of the 2017 hurricane loss provision.

Investment-related experience was a loss of $30 million in 4Q18 compared with a gain of $118 million in 4Q17. The loss in 4Q18 was driven by lower than expected returns (including changes in fair value) on ALDA, predominantly oil & gas, mostly offset by the favourable impact of fixed income reinvestment activities on the measurement of our policy liabilities. The gains in 4Q17 reflected the favourable impact of fixed income reinvestment activities on the measurement of our policy liabilities and strong credit experience.

The table below reconciles net income attributed to shareholders to core earnings for the periods presented and provides further details for each of the items excluded from core earnings.

For the quarters ended December 31, ($ millions)	4Q18	4Q17
Core earnings	**$ 1,337**	$ 1,205
Items excluded from core earnings		
Investment-related experience outside of core earnings	**(130)**	18
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities (see table below)[1]	**(675)**	(68)
Change in actuarial methods and assumptions	**–**	(33)
Impact related to U.S. Tax Reform	**–**	(1,777)
Charge related to decision to change portfolio asset mix supporting our legacy businesses	**–**	(1,032)
Restructuring charge[2]	**(63)**	–
Reinsurance transactions and other[3]	**124**	81
Total items excluded from core earnings	**(744)**	(2,811)
Net income (loss) attributed to shareholders	**$ 593**	$ (1,606)

(1) Actual market performance differed from our valuation assumptions in 4Q18, which resulted in a macro hedge experience gain of $25 million. This gain is included in the direct impact of equity markets and interest rates and variable annuity guarantee liabilities below.
(2) The restructuring charge is described in full in the "Manulife Financial Corporation – Profitability" section at the beginning of the MD&A. The 4Q18 charge of $63 million is an update to the estimated $200 million charge that was reported in the second quarter of 2018.
(3) The 4Q18 gain of $124 million includes a gain resulting from external reinsurance transactions partially offset by the charge related to the integration of businesses acquired from Standard Life plc. The 4Q17 gain of $81 million included a gain resulting from an internal legal entity restructuring partially offset by a provision for a legal settlement, Thailand operations restructuring charges and a charge related to the integration of businesses acquired from Standard Life plc.

The gain (charge) related to the direct impact of equity markets and interest rates and variable annuity guarantee liabilities in the table above is attributable to:

For the years ended December 31, ($ millions)	4Q18	4Q17
Direct impact of equity markets and variable annuity guarantee liabilities[1]	**$ (723)**	$ 130
Fixed income reinvestment rates assumed in the valuation of policy liabilities[2]	**112**	(155)
Sale of AFS bonds and derivative positions in the Corporate and Other segment	**(64)**	40
Risk reduction related items	**-**	(83)
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	**$ (675)**	$ (68)

(1) In 4Q18, losses of $2,362 million from gross equity exposure were partially offset by gains of $1,615 million from dynamic hedging experience and $25 million from macro hedge experience, which resulted in a loss of $723 million.
(2) The $112 million gain in 4Q18 for fixed income reinvestment assumptions was driven by the increases in corporate spreads which resulted in an increase in the reinvestment yields on future fixed income purchases assumed in the measurement of policy liabilities partially offset by a decrease in risk-free rates increases in swap spreads that resulted in a decrease in the fair value of our swaps.

Growth

Growth metrics

As at and for the quarters ended December 31, ($ millions, unless otherwise stated)	2018	2017	2016
Asia APE sales	**$ 1,040**	$ 884	$ 824
Canada APE sales	**277**	222	302
U.S. APE sales	**152**	153	159
Total APE sales	**1,469**	1,259	1,285
Asia new business value	**402**	319	294
Canada new business value	**51**	48	41
U.S. new business value	**48**	16	25
Total new business value[1]	**501**	383	360
Wealth and asset management gross flows ($ billions)[1]	**26.3**	32.2	37.6
Wealth and asset management net flows ($ billions)[1]	**(9.0)**	3.6	6.5
Wealth and asset management assets under management and administration ($ billions)[1]	**608.8**	609.0	554.1

(1) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

Sales

APE sales were $1.5 billion in 4Q18, an increase of 14% compared with 4Q17. In Asia, 4Q18 APE sales increased 15% compared with 4Q17, with growth across Japan, Hong Kong and Asia Other. 4Q18 APE sales in Japan increased 34% compared with 4Q17, driven by the continued success of the new COLI term product. Hong Kong APE sales increased 8% in 4Q18 compared with 4Q17, driven by growth in our bancassurance channel. Asia Other 4Q18 APE sales increased 4% compared with 4Q17 as higher sales of protection products were partially offset by lower sales of single premium investment-linked products, reflecting market volatility. In Canada, 4Q18 APE sales increased 25% compared with 4Q17, driven by the continued success of our recently-launched Manulife Par product and a large-case group insurance sale. In the U.S., 4Q18 APE sales declined 5% compared with 4Q17 driven by increased competition in the international high net worth segment and actions to maintain margins.

New Business Value was $501 million in 4Q18, an increase of 27% compared with 4Q17. In Asia, NBV increased 23% from 4Q17 to $402 million due to higher sales, scale benefits, and improved product mix. Canada NBV increased 6% as the benefits from the launch of Manulife Par were partially offset by a less favourable business mix in group insurance. U.S. NBV almost tripled due to actions to improve margins and a more favourable business mix.

Wealth and Asset Management net flows were negative $9.0 billion in 4Q18, compared with positive net flows of $3.6 billion in 4Q17. Net flows in Asia were $1.1 billion in 4Q18, compared with net flows of $2.3 billion in 4Q17, driven by lower gross flows in institutional asset management. Net flows in Canada were negative $0.7 billion in 4Q18 compared with positive net flows of $0.7 billion in 4Q17, driven by lower net flows in retail amid equity market declines and higher redemptions in retirement. Net flows in the U.S. were negative $9.4 billion in 4Q18 compared with positive net flows of $0.6 billion in 4Q17, driven by higher retail redemptions amid the declines in equity markets.

Wealth and Asset Management gross flows were $26.3 billion in 4Q18, 20% lower than 4Q17, driven by lower retail gross flows across all regions. In Asia, we experienced a decline in money market fund gross flows in mainland China, and in U.S. and Canada we recorded lower gross flows amid equity market declines. Growth in institutional asset management partially offset this decline, with the funding of a custom Liability Driven Investment mandate in Canada and two large mandates in Europe reduced by lower gross flows in mainland China.

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Quarterly Financial Information

The following table provides summary information related to our eight most recently completed quarters:

As at and for the three months ended ($ millions, except per share amounts or otherwise stated)	Dec 31, 2018	Sept 30, 2018	Jun 30, 2018	Mar 31, 2018	Dec 31, 2017	Sept 30, 2017	Jun 30, 2017	Mar 31, 2017
Revenue								
Premium income								
Life and health insurance	**$ 7,724**	$ 7,700	$ 7,628	$ 7,300	$ 6,000	$ 6,321	$ 6,040	$ 5,994
Annuities and pensions	**(5,892)**	(2,599)	1,126	1,025	943	922	934	1,056
Net premium income	**1,832**	5,101	8,754	8,325	6,943	7,243	6,974	7,050
Investment income	**3,278**	3,481	3,566	3,235	3,579	3,309	3,444	3,317
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities[1]	**1,113**	(3,210)	(1,615)	(5,316)	2,988	(1,163)	3,303	590
Other revenue	**2,291**	2,671	2,964	2,502	2,737	2,544	2,872	2,593
Total revenue	**$ 8,514**	$ 8,043	$ 13,669	$ 8,746	$ 16,247	$ 11,933	$ 16,593	$ 13,550
Income (loss) before income taxes	**$ 359**	$ 1,911	$ 1,535	$ 1,714	$ (2,123)	$ 1,269	$ 1,618	$ 1,737
Income tax (expense) recovery	**(43)**	(6)	(246)	(337)	424	(13)	(304)	(346)
Net income (loss)	**$ 316**	$ 1,905	$ 1,289	$ 1,377	$ (1,699)	$ 1,256	$ 1,314	$ 1,391
Net income (loss) attributed to shareholders	**$ 593**	$ 1,573	$ 1,262	$ 1,372	$ (1,606)	$ 1,105	$ 1,255	$ 1,350
Reconciliation of core earnings to net income attributed to shareholders								
Total core earnings[2]	**$ 1,337**	$ 1,539	$ 1,431	$ 1,303	$ 1,205	$ 1,085	$ 1,174	$ 1,101
Other items to reconcile net income attributed to shareholders to core earnings								
Investment-related experience in excess of amounts included in core earnings	**(130)**	312	18	–	18	11	138	–
Direct impact of equity markets, interest rates and variable annuity guarantee liabilities	**(675)**	(277)	45	50	(68)	47	(37)	267
Change in actuarial methods and assumptions	**–**	(51)	–	–	(33)	(2)	–	–
Charge related to decision to change portfolio asset mix supporting our legacy businesses	**–**	–	–	–	(1,032)	–	–	–
Charge related to U.S. Tax Reform	**–**	124	–	–	(1,777)	–	–	–
Restructuring charges	**(63)**	–	(200)	–	–	–	–	–
Reinsurance transaction and other	**124**	(74)	(32)	19	81	(36)	(20)	(18)
Net income (loss) attributed to shareholders	**$ 593**	$ 1,573	$ 1,262	$ 1,372	$ (1,606)	$ 1,105	$ 1,255	$ 1,350
Basic earnings (loss) per common share	**$ 0.28**	$ 0.77	$ 0.61	$ 0.67	$ (0.83)	$ 0.54	$ 0.62	$ 0.66
Diluted earnings (loss) per common share	**$ 0.28**	$ 0.77	$ 0.61	$ 0.67	$ (0.83)	$ 0.54	$ 0.61	$ 0.66
Segregated funds deposits	**$ 9,212**	$ 9,424	$ 9,872	$ 9,728	$ 8,421	$ 8,179	$ 8,544	$ 9,632
Total assets (in billions)	**$ 750**	$ 748	$ 752	$ 740	$ 730	$ 713	$ 726	$ 728
Weighted average common shares (in millions)	**1,980**	1,984	1,984	1,983	1,980	1,978	1,977	1,976
Diluted weighted average common shares (in millions)	**1,983**	1,989	1,989	1,989	1,988	1,986	1,984	1,984
Dividends per common share	**$ 0.250**	$ 0.220	$ 0.220	$ 0.220	$ 0.205	$ 0.205	$ 0.205	$ 0.205
CDN$ to US$1 – Statement of Financial Position	**1.3642**	1.2945	1.3168	1.2894	1.2545	1.2480	1.2977	1.3323
CDN$ to US$1 – Statement of Income	**1.3204**	1.3069	1.2912	1.2647	1.2712	1.2528	1.3450	1.3238

(1) For fixed income assets supporting insurance and investment contract liabilities and for equities supporting pass-through products and derivatives related to variable hedging programs, the impact of realized and unrealized gains (losses) on the assets is largely offset in the change in insurance and investment contract liabilities.
(2) This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" above.

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Selected Annual Financial Information

As at and for the years ended December 31, ($ millions, except per share amounts)	2018	2017	2016
Revenue			
Asia	**$ 19,687**	$ 20,690	$ 18,737
Canadian	**13,637**	11,187	11,335
U.S.	**639**	21,318	18,017
Global Wealth and Asset Management	**5,464**	5,200	4,928
Corporate and Other	**(455)**	(72)	320
Total revenue	**$ 38,972**	$ 58,323	$ 53,337
Total assets	**$ 750,271**	$ 729,533	$ 720,681
Long-term financial liabilities			
Long-term debt	**$ 4,769**	$ 4,785	$ 5,696
Capital instruments	**8,732**	8,387	7,180
Total financial liabilities	**$ 13,501**	$ 13,172	$ 12,876
Dividend per common share	**$ 0.91**	$ 0.82	$ 0.74
Cash dividend per Class A Share, Series 2	**1.1625**	1.1625	1.1625
Cash dividend per Class A Share, Series 3	**1.125**	1.125	1.125
Cash dividend per Class 1 Share, Series 3(1)	**0.5445**	0.5445	0.7973
Cash dividend per Class 1 Share, Series 4(1)	**0.6536**	0.4918	0.2431
Cash dividend per Class 1 Share, Series 5	**0.9728**	0.9728	1.10
Cash dividend per Class 1 Share, Series 7	**1.078**	1.096	1.15
Cash dividend per Class 1 Share, Series 9	**1.0878**	1.0969	1.10
Cash dividend per Class 1 Share, Series 11	**1.1371**	1.00	1.00
Cash dividend per Class 1 Share, Series 13	**0.9884**	0.95	0.95
Cash dividend per Class 1 Share, Series 15	**0.975**	0.975	0.975
Cash dividend per Class 1 Share, Series 17	**0.975**	0.975	0.975
Cash dividend per Class 1 Share, Series 19	**0.95**	0.95	0.95
Cash dividend per Class 1 Share, Series 21(2)	**1.40**	1.40	1.1411
Cash dividend per Class 1 Share, Series 23(3)	**1.2125**	1.298	–
Cash dividend per Class 1 Share, Series 25(4)	**0.9706**	–	–

(1) 1,664,169 of 8,000,000 Series 3 Shares were converted, on a one-for-one basis, into Series 4 Shares on June 20, 2016. 6,335,831 Series 3 Shares remain outstanding.
(2) On February 25, 2016, MFC issued 16 million of Series 21 Shares and on March 3, 2016, MFC issued an additional 1 million Series 21 Shares pursuant to the exercise in full by the underwriters of their option to purchase additional Series 21 Shares.
(3) On November 22, 2016, MFC issued 19 million of Non-cumulative Rate Reset Class 1 Shares Series 23. No dividends were paid in 2016.
(4) On February 20, 2018, MFC issued 10 million of Non-cumulative Rate Reset Class 1 Shares Series 25.

Differences between IFRS and Hong Kong Financial Reporting Standards

Manulife's Consolidated Financial Statements are presented in accordance with IFRS. IFRS differs in certain respects from Hong Kong Financial Reporting Standards ("HKFRS"). Until IFRS 17 "Insurance Contracts" is issued and becomes effective, IFRS 4 "Insurance Contracts" permits the use of the insurance standard in effect at the time an issuer adopts IFRS. IFRS insurance contract liabilities are valued in Canada under standards established by the Canadian Actuarial Standards Board. In certain interest rate environments, insurance contract liabilities determined in accordance with HKFRS may be higher than those computed in accordance with current IFRS.

IFRS and Hong Kong Regulatory Requirements

Insurers in Hong Kong are required by the Insurance Authority to meet minimum solvency requirements. As at December 31, 2018, the Company's business that falls within the scope of these requirements has sufficient assets to meet the minimum solvency requirements under both Hong Kong regulatory requirements and IFRS.

Outstanding Common Shares

As at January 31, 2019, MFC had 1,963,710,812 common shares outstanding.

Additional Information Available

Additional information relating to Manulife, including MFC's Annual Information Form, is available on the Company's website at www.manulife.com and on SEDAR at www.sedar.com.

Exhibit 99.3



MANULIFE FINANCIAL CORPORATION

Annual Information Form

February 13, 2019

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Presentation of Information

In this annual information form ("AIF"), unless otherwise indicated or unless the context otherwise requires:

- all references to "MFC" and "Manufacturers Life" refer to Manulife Financial Corporation and The Manufacturers Life Insurance Company, respectively, not including their subsidiaries;
- MFC and its subsidiaries, including Manufacturers Life, are collectively referred to as "Manulife";
- references to "Company", "we", "us" and "our" refer to Manulife;
- references to "$" are to Canadian dollars; and
- information is as at December 31, 2018.

Documents Incorporated by Reference

The following documents are incorporated by reference in and form part of this AIF:

- MFC's Management's Discussion and Analysis for the year ended December 31, 2018 (our "2018 MD&A"); and
- MFC's audited annual consolidated financial statements and accompanying notes as at and for the year ended December 31, 2018 (our "2018 Consolidated Financial Statements").

These documents have been filed with securities regulators in Canada and may be accessed at the System for Electronic Document Analysis and Retrieval ("SEDAR"), found at www.sedar.com. They have also been filed with the U.S. Securities and Exchange Commission (the "SEC") and may be found at www.sec.gov.

Any website address included in this AIF is an inactive textual reference only and information appearing on such website is not part of, and is not incorporated by reference in, this AIF.

Caution Regarding Forward-Looking Statements

From time to time, the Company makes written and/or oral forward-looking statements, including in this document and the documents incorporated by reference in this document. In addition, the Company's representatives may make forward-looking statements orally to analysts, investors, the media and others. All such statements are made pursuant to the "safe harbour" provisions of Canadian provincial securities laws and the U.S. *Private Securities Litigation Reform Act of 1995*.

The forward-looking statements in this document and the documents incorporated by reference in this document include, but are not limited to, statements with respect to the Company's possible or assumed future results set out under "General Development of the Business", "Business Operations" and "Government Regulation"; the Company's strategic priorities and 2022 targets for net promoter score, employee engagement, its highest potential businesses, expense efficiency and portfolio optimization; the reduction in the allocation to alternative long-duration assets in our portfolio asset mix supporting our legacy business by mid-2019; and the annual pre-tax run-rate savings to be achieved by the end of 2019, and also relate to, among other things, our objectives, goals, strategies, intentions, plans, beliefs, expectations and estimates, and can generally be identified by the use of words such as "may", "will", "could", "should", "would", "likely", "suspect", "outlook", "expect", "intend", "estimate", "anticipate", "believe", "plan", "forecast", "objective", "seek", "aim", "continue", "goal", "restore", "embark" and "endeavour" (or the negative thereof) and words and expressions of similar import, and include statements concerning possible or assumed future results. Although we believe that the expectations reflected in such forward-looking statements are reasonable, such statements involve risks and uncertainties, and undue reliance should not be placed on such statements and they should not be interpreted as confirming market or analysts' expectations in any way.

Certain material factors or assumptions are applied in making forward-looking statements, and actual results may differ materially from those expressed or implied in such statements. Important factors that could cause actual results to differ materially from expectations include, but are not limited to, the factors identified under "Caution regarding forward-looking statements" in our 2018 MD&A. Additional information about material risk factors that could cause actual results to differ materially from expectations and about material factors or assumptions applied in making forward-looking statements may be found under "Risk Management", "Risk Factors" and "Critical Accounting and Actuarial Policies" in our 2018 MD&A, in the "Risk Management" note to our 2018 Consolidated Financial Statements

and elsewhere in MFC's filings with Canadian and U.S. securities regulators. The forward-looking statements in this document or in the documents incorporated by reference in this document are, unless otherwise indicated, stated as of the date hereof or the date of the document incorporated by reference, as the case may be, and are presented for the purpose of assisting investors and others in understanding the Company's financial position and results of operations, our future operations, as well as the Company's objectives and strategic priorities, and may not be appropriate for other purposes. The Company does not undertake to update any forward-looking statements, except as required by law.

CORPORATE STRUCTURE

Name, Address and Incorporation

Manulife Financial Corporation is a life insurance company incorporated under the *Insurance Companies Act* (Canada) (the "ICA") on April 26, 1999 for the purpose of becoming the holding company of Manufacturers Life following its demutualization. Manufacturers Life was incorporated on June 23, 1887, by a Special Act of Parliament of the Dominion of Canada, and was converted into a mutual life insurance company in 1968. Pursuant to Letters Patent of Conversion, effective September 23, 1999, Manufacturers Life implemented a plan of demutualization under the ICA and converted to a life insurance company with common shares and became the wholly owned subsidiary of MFC.

MFC's head office and registered office is located at 200 Bloor Street East, Toronto, Canada, M4W 1E5.

Intercorporate Relationships

The major operating subsidiaries of MFC, including direct and indirect subsidiaries, and MFC's direct and indirect voting interest therein, are listed in Note 21 (Subsidiaries) to our 2018 Consolidated Financial Statements. These companies are incorporated in the jurisdiction in which their head office or registered office is located.

GENERAL DEVELOPMENT OF THE BUSINESS

Three Year History

In 2018, the Company continued to execute against our five priorities and bold ambition of becoming the most digital and customer-centric global company in our industry and delivering top quartile shareholder returns. Highlights with respect to these priorities are outlined in our 2018 MD&A. Also in 2018, several changes in key management became effective, including the following: Philip Witherington became CFO, and Naveed Irshad became Head, North American Legacy Business.

In 2017, the following key management changes occurred: Roy Gori became President and CEO; Michael Doughty became President and CEO, Manulife Canada; Marianne Harrison became President and CEO, John Hancock; Anil Wadhwani became President and CEO, Manulife Asia; and Paul Lorentz became Head, Global Wealth and Asset Management. In 2017, Manulife raised $2.2 billion of capital in Canada, the U.S., and Singapore, and became the first life insurer to complete the issuance of a green bond.

Effective January 1, 2016, the Company became the exclusive provider of bancassurance solutions to DBS Bank Ltd's six million retail, wealth and small and medium-sized enterprises customers in four mutually significant markets: Singapore, Hong Kong, Indonesia and mainland China. In 2016, Manulife commenced its global funding strategy to diversify funding sources and broaden its investor base, raising $5.4 billion of capital in Canada, the U.S., and various Asian markets.

Additional information about our business can be found in the "Business Operations" section below, and in MFC's 2018 MD&A, on pages 10 to 35 inclusive.

BUSINESS OPERATIONS

Information about our business and operating segments, our strategy, products, and investment activities, is included in MFC's 2018 MD&A, on pages 10 to 35.

DISTRIBUTION METHODS

The Company has a multi-channel distribution network in all the segments in which it operates, with different emphasis depending on the product line and geography.

Asia Our multi-channel distribution network in Asia includes contracted agents, bank partnerships and independent agents, financial advisors and brokers. Our bancassurance partnerships include a long-term, exclusive regional partnership with DBS in Singapore, Hong Kong, mainland China and Indonesia.

In Hong Kong and Macau, our insurance products are marketed through the Company's agency, bancassurance partnerships, and independent broker channels.

In Japan, product offerings are marketed through proprietary sales agents, independent agencies or managing general agents ("MGA") and bancassurance partners. Corporate products are mainly sold through MGAs.

In Indonesia, the Philippines, Singapore, Taiwan (China), mainland China, Vietnam, Malaysia, Cambodia and Thailand, products are marketed through exclusive agents, bank channels, including exclusive partnerships, brokerage, independent financial advisors and telemarketing.

Canada We offer a diverse range of financial protection, insurance-based wealth accumulation products and banking solutions through a diversified multi-channel distribution network.

Retail Insurance products are distributed primarily through independent advisors who sell our products, as well as those of other life insurance companies.

Group Benefits products are sold to employers (sponsors) and are distributed through various distribution channels, including a national network of regional offices that provide support to plan sponsors.

The Company is a leading provider of life, living benefits, health and travel insurance to affinity organizations in Canada, including professional, alumni and retiree associations and financial and retail institutions. Products are offered through partnerships, sponsor groups and associations, as well as direct-to-customer marketing.

Manulife Bank of Canada products are offered through financial advisors supported by a broad distribution network.

U.S. Operating under the John Hancock brand in the U.S., our product suite is distributed primarily through licensed financial advisors. We are also focused on providing digital solution capabilities to access more customers and better support our advisor-led channels.

Global Wealth and Asset Management We serve individual investors and institutional clients with operations in 16 markets. Our global retirement products are marketed through distribution channels that include independent advisors, consultants, exclusive agents and bank channels, depending on the geography.

Our Canadian Group Retirement business works with a network of market sources, primarily brokers and consultants. In the U.S., John Hancock Retirement Plan Services products are marketed by sales account executives primarily to third party advisors and consultants, including those who specialize in retirement plans. In Hong Kong, group pension products are primarily distributed through our exclusive agents and bank channel. We also have an exclusive Mandatory Provident Fund distribution partnership with Standard Chartered Bank to serve the retirement needs of Hong Kong.

Our retail investment products are distributed through intermediaries in North America, Europe and Asia. Our mutual funds in Canada are sold through regulated advisors, while our distribution partnerships include independent advisors, general agency brokers as well as full service brokers with investment dealer firms. Operating under the John Hancock Investments brand in the U.S., we distribute retail funds primarily through financial intermediaries and advice-driven platforms. We sell mutual funds, including retail funds and investment-linked policy funds, in all twelve of our Asian markets through bank channels, brokers, securities firms, affiliate agents and digital channels.

Our institutional asset management business provides comprehensive asset management solutions for pension plans, foundations, endowments, financial institutions and other institutional investors worldwide.

COMPETITION

We operate in highly competitive markets and compete for customers with other insurance companies, banks, wealth management companies, and mutual fund companies. We also compete with emerging fintechs, as well as non-traditional technology players entering the financial services industry. Customer loyalty and retention, and access to distributors, are important to the Company's success and are influenced by many factors, including our distribution practices and regulations, product features, service levels, prices, and our financial strength ratings and reputation.

Key trends that are increasing competitive pressures in all our markets include: (1) digital solutions to enhance the customer experience and (2) simplified and innovative product offerings. Both traditional and non-traditional competitors are beginning to evolve their strategies to respond to these trends.

Asia Most Asian territories have concentrated markets with the top three players often having over 40% market share of total premium income. As one of the few foreign insurance companies with a broad Asian footprint and scale in both the developed insurance markets and developing insurance markets, we believe that the Company is well positioned to benefit from the potential in the region.

Canada The financial protection market remains dominated by the three large Canadian insurance providers, of which we are one, while certain regional or smaller carriers focused on specialty products or niche segments are extremely competitive in some markets.

U.S. Competition in the U.S. is primarily with other large insurance firms, as well as mutual insurance companies, that distribute comparable products through similar channels. With our entry into the direct-to-customer insurance channel and our ongoing development of a customer-facing advice platform, competition has expanded to include traditional advice providers and emerging digital advice platforms.

Global Wealth and Asset Management In North America, the wealth and asset management market continues to be led by large wealth management companies. Across our Asian markets, we operate in very competitive markets comprised of global, pan-Asian, and regional wealth and asset managers. Our institutional asset management competitors are made up of a disparate group of global and regional institutional asset management companies, each of whom competes with us in distinct asset classes.

CORPORATE CITIZENSHIP REPORT AND PUBLIC ACCOUNTABILITY STATEMENT

We report on the economic, environmental and social dimensions of our products and services, operations and community activities annually in Manulife's Corporate Citizenship Report and Public Accountability Statement. The report details our commitment to social responsibility, environmental sustainability, excellence in business conduct and corporate governance. This document can be found in the Corporate Citizenship section of the Company's website at www.manulife.com/corporate-citizenship.

RISK FACTORS

An explanation of the broad categories of risks facing the Company and Manulife's risk management strategies for each category as well as a discussion of the specific risks and uncertainties to which our business operations and financial condition are subject can be found in the sections entitled "Risk Management" and "Risk Factors", respectively, in our 2018 MD&A.

As noted under "Caution Regarding Forward-Looking Statements", forward-looking statements involve risks and uncertainties and actual results may differ materially from those expressed or implied in such statements. Strategic risk, market risk, credit risk, product risk and operational risk are the major categories of risk described in the sections of our 2018 MD&A. These risk factors should be considered in conjunction with the other information in this AIF and the documents incorporated by reference herein.

GOVERNMENT REGULATION

As an insurance company, Manulife is subject to regulation and supervision by governmental authorities in the jurisdictions in which it does business. In Canada, the Company is subject to both federal and provincial regulation. In the United States, the Company is primarily regulated by each of the states in which it conducts business and by federal securities laws. The Company's Asia operations are similarly subject to a variety of regulatory and supervisory regimes in each of the Asian jurisdictions in which the Company operates, which vary in degree of regulation and supervision.

CANADA

Manulife is governed by the ICA. The ICA is administered, and activities of the Company are supervised, by the Office of the Superintendent of Financial Institutions (Canada)("OSFI"), the primary regulator of federal financial institutions. The ICA permits insurance companies to offer, directly or through subsidiaries or through networking arrangements, a broad range of financial services, including banking, investment counseling and portfolio management, mutual funds, trust services, real property brokerage and appraisal, information processing and merchant banking services.

The ICA requires the filing of annual and other reports on the financial condition of the Company, provides for periodic examinations of the Company's affairs, imposes restrictions on transactions with related parties, and sets forth requirements governing reserves for actuarial liabilities and the safekeeping of assets and other matters. OSFI supervises Manulife on a consolidated basis (including capital adequacy) to ensure that OSFI has an overview of the group's activities. This includes the ability to review both insurance and non-insurance activities conducted by subsidiaries of Manulife with supervisory power to bring about corrective action.

Capital Requirements

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

The Life Insurance Capital Adequacy Test ("LICAT") framework came into effect on January 1, 2018, replacing the Minimum Continuing Capital and Surplus Requirements ("MCCSR") for Canadian federally regulated life insurance companies. Capital requirements for MFC and Manufacturers Life are governed by the LICAT guideline, with LICAT ratios prepared on a consolidated basis. LICAT uses a risk-based approach to measure and aggregate specified risks to calculate the amount of regulatory capital required to support these risks. It measures the capital adequacy of a life insurer and is one of several indicators used by OSFI to assess a life insurer's financial condition. The LICAT total ratio compares capital resources to the Base Solvency Buffer, which is the risk-based capital requirement determined in accordance with the guideline.[1]

Capital resources include Available Capital, as well as a Surplus Allowance derived from provisions for adverse deviations in the reserves, and Eligible Deposits from unregistered reinsurers. Available Capital includes common equity, qualifying preferred shares, qualifying innovative tier 1 instruments, subordinated debt, contributed surplus, retained earnings, adjusted Accumulated Other Comprehensive Income (AOCI), and the participating account. Under LICAT, certain deductions are made from Available Capital, including goodwill, intangible assets, a portion of deferred tax assets, controlling interests in non-life financial corporations and non-controlled substantial investments.

The Base Solvency Buffer is equal to the aggregated capital requirements, net of credits for diversification and qualifying participating and adjustable products, multiplied by a scalar of 1.05. The capital requirements cover the following five risk components: market risk, credit risk, insurance risk, operational risk and segregated funds guarantee risk.

The minimum regulatory LICAT total ratio is 90% for MFC and Manufacturers Life; in addition, Manufacturers Life is subject to a supervisory target of 100% for the total ratio. OSFI expects each insurance company to establish an internal target capital level that provides a cushion above the regulatory requirements. This cushion allows for coping with volatility in markets and economic conditions, and enhances flexibility in capital management to consider aspects

1 In addition to the LICAT total ratio, the LICAT guideline also defines a LICAT core ratio.

such as innovations in the industry, consolidation trends and international developments. OSFI may require that a higher amount of capital be available, taking into account such factors as operating experience and diversification of asset or insurance portfolios. MFC endeavours to manage its business such that LICAT ratios for both MFC and Manufacturers Life are above their internal targets. At December 31, 2018, the LICAT total ratio for MFC was 132% and was 143% for Manufacturers Life.

OSFI may intervene and assume control of a Canadian life insurance company if it deems the amount of available capital insufficient. Capital requirements may be adjusted by OSFI as experience develops, the risk profile of Canadian life insurers changes, or to reflect other risks.

See the section entitled “Risk Factors” in our 2018 MD&A, for information about regulatory initiatives and other developments which could impact MFC’s capital position.

Regulated subsidiaries of MFC must maintain minimum levels of capital, which are based on the local capital regime and the statutory accounting basis in each jurisdiction. The Company seeks to maintain capital in excess of the minimum required, in all foreign jurisdictions in which the Company does business.

Investment Powers

Under the ICA, Manulife must maintain a prudent portfolio of investments and loans, subject to certain overall limitations on the amount it may invest in certain classes of investments, such as commercial loans. Additional restrictions (and in some cases, the need for regulatory approvals) limit the type of investment that the Company can make in excess of 10% of the voting rights or 25% of the equity of any entity.

Restrictions on Shareholder Dividends and Capital Transactions

The ICA prohibits the declaration or payment of any dividend on shares of an insurance company if there are reasonable grounds for believing an insurance company does not have adequate capital and adequate and appropriate forms of liquidity, or declaration or the payment of the dividend would cause the insurance 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 the Superintendent of Financial Institutions (Canada) (the “Superintendent”). The ICA also requires an insurance company to notify the Superintendent 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 purchase 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 the Superintendent. These latter transactions would require the prior approval of the Superintendent. There is currently no direction against MFC or Manufacturers Life paying a dividend or redeeming or purchasing their shares for cancellation.

Appointed Actuary

In accordance with the ICA, the Board of Directors of MFC (the “Board”) has appointed the Appointed Actuary who must be a Fellow of the Canadian Institute of Actuaries. The Appointed Actuary is required to value the policy liabilities of Manulife as at the end of each financial year in accordance with accepted actuarial practices[2] with such changes as may be determined by the Superintendent and any direction that may be made by the Superintendent, including selection of appropriate assumptions and methods. The Appointed Actuary must make a report in the prescribed form on the valuation including providing an opinion as to whether the consolidated financial statements fairly present the results of the valuation. At least once in each financial year, the Appointed Actuary must meet with the Board, or the Audit Committee, to report, in accordance with accepted actuarial practice and any direction that may be made by the Superintendent, on the current and expected future financial condition of the Company. The Appointed Actuary is also required to report to the President and Chief Executive Officer and the Chief Financial Officer of the Company if the

2 Accepted actuarial practices means Canadian accepted actuarial practices as established by the Actuarial Standards Board.

Appointed Actuary identifies any matters that, in the Appointed Actuary's opinion, have material adverse effects on the financial condition of the Company and require rectification.

Prescribed Supervisory Information

The Supervisory Information (Insurance Companies) Regulations made under the ICA prohibit regulated insurance companies, such as MFC and Manufacturers Life, from disclosing, directly or indirectly, "prescribed supervisory information", as defined in those Regulations. Prescribed supervisory information includes assessments, recommendations, ratings and reports concerning the Company made by or at the request of the Superintendent, orders of the Superintendent with respect to capital and liquidity, certain regulatory actions taken with respect to the Company, prudential agreements between the Company and the Superintendent, and directions of the Superintendent that we cease or refrain from committing, or remedy, unsafe or unsound practices in conducting our business.

Provincial Insurance Regulation

The Company is also subject to provincial regulation and supervision in each province and territory of Canada in which it carries on business. Provincial insurance regulation is concerned primarily with the form of insurance contracts and the sale and marketing of insurance and annuity products, including the licensing and supervision of insurance producers. Individual variable insurance contracts and the underlying segregated funds to which they relate are also subject to guidelines established by the Canadian Council of Insurance Regulators (together with the Canadian Life and Health Insurance Association Inc.) which guidelines have regulatory standing in Ontario, are consistent with guidelines in Quebec adopted under the authority of Quebec insurance legislation, and are generally followed by the regulators of all other provinces. These guidelines govern a number of matters relating to the sale of these products and the administration of the underlying segregated funds. Manufacturers Life is licensed to transact business in all provinces and territories of Canada.

Provincial/Territorial Securities Laws

The Company's Canadian investment fund, dealer and asset management businesses are subject to Canadian provincial and territorial securities laws. Manulife Asset Management Limited ("MAML") is registered as a portfolio manager with the securities commissions in all Canadian provinces and territories, as an investment fund manager in the provinces of Ontario, Newfoundland and Labrador and Quebec, as a commodity trading manager in Ontario, and as a derivatives portfolio manager in Quebec. Manulife Asset Management Investments Inc. ("MAMII") is registered as an exempt market dealer with the securities commissions in all Canadian provinces and territories. MAML and MAMII are subject to regulation by the applicable provincial securities regulators. Manulife Securities Investment Services Inc. ("MSISI") is registered under provincial and territorial securities laws to sell mutual funds across Canada and is subject to regulation by the applicable provincial and territorial securities regulators as well as the Mutual Fund Dealers Association ("MFDA"), a self-regulatory organization. MSISI is also registered as an exempt market dealer in all Canadian provinces and territories. Manulife Securities Incorporated ("MSI") is registered under provincial and territorial securities laws to sell investments across Canada and is subject to regulation by the provincial and territorial securities regulators as well as the Investment Industry Regulatory Association of Canada ("IIROC"), a self-regulatory organization. MSI is also registered as a derivatives dealer in Quebec.

Consumer Protection for Financial Institution Failure

Assuris was created by the life and health insurance industry in Canada in 1990 to provide Canadian policyholders with protection in the event of the insolvency of their insurance company. Assuris is funded by its member insurance companies, including Manufacturers Life and Manulife Assurance Company of Canada. Member companies of Assuris are assessed to build and maintain a liquidity fund at a minimum level of $100 million. Members are then primarily subject to assessment on an "as needed" basis. Effective in March 2019, the assessment base for member companies will be calculated using each member's solvency buffer (as opposed to the currently employed total capital required), subject to adjustments where the member operates in foreign jurisdictions.

The Canadian Investor Protection Fund (“CIPF”) has been created to provide clients with protection, within defined limits, in the event of the insolvency of their IIROC investment dealer. The CIPF is funded by its member investment dealers, including MSI.

The MFDA Investor Protection Corporation (“IPC”) has been created to provide clients with protection, within defined limits, in the event of the insolvency of their mutual fund dealer. The IPC is funded by its member mutual fund dealers, including MSISI.

The Canada Deposit Insurance Corporation (“CDIC”) is a federal crown corporation created by parliament in 1967 to protect deposits made with member financial institutions in case of their failure. CDIC member institutions, including Manulife Bank and its subsidiary Manulife Trust Company, fund deposit insurance through premiums paid on the insured deposits that they hold.

UNITED STATES

General Regulation at the State Level

The various states in the United States have laws regulating transactions between insurers and other members of insurance holding company systems. Transactions between the Company’s U.S. insurers and their affiliates are subject to regulation by the states in which such insurance subsidiaries are domiciled and for certain limited matters, states in which they transact business. Most states have enacted legislation that requires each insurance holding company and each insurance subsidiary in an insurance holding company system to register with, and be subject to regulation by, the insurance regulatory authority of the insurance subsidiary’s state of domicile. The Company’s principal U.S. life insurance subsidiaries are John Hancock Life Insurance Company (U.S.A.) (“JHUSA”), John Hancock Life Insurance Company of New York (“JHNY”) and John Hancock Life & Health Insurance Company (“JHLH”). They are domiciled in Michigan, New York and Massachusetts, respectively. Under such laws, the insurance subsidiaries are required to annually furnish financial and related information concerning the operations of companies within the holding company system that may materially affect the operations, management or financial condition of insurers within the system. These reports are also filed with other insurance departments on request. In addition, such laws provide that all transactions within an insurance holding company system must be fair and equitable, and following any such transactions, each insurer’s policyholder surplus must be both reasonable in relation to its outstanding liabilities and adequate for its needs.

The laws of the various states also establish regulatory agencies with broad administrative powers, such as the power to approve policy forms, grant and revoke licenses to transact business, regulate trade practices, license agents, require financial statements and prescribe the type and amount of investment permitted. State insurance regulatory authorities regularly make inquiries, hold investigations and administer market conduct examinations with respect to an insurer’s compliance with applicable insurance laws and regulations.

Insurance companies are required to file detailed annual statements with state insurance regulators in each of the states in which they do business and their business and accounts are subject to examination by such regulators at any time. Quarterly statements must also be filed with the state insurance regulator in the insurer’s state of domicile and with the insurance departments of many of the states in which the insurer does business. Insurance regulators may periodically examine an insurer’s financial condition, adherence to statutory accounting practices and compliance with insurance department rules and regulations.

State insurance departments, as part of their routine oversight process, conduct detailed examinations of the books, records and accounts of insurance companies domiciled in their states. These examinations are generally conducted in accordance with the examining state’s laws and the guidelines promulgated by the National Association of Insurance Commissioners, an association of the chief insurance supervisory officials of each state, territory or possession of the United States (the “NAIC”). Each of the Company’s principal U.S. domiciled insurance subsidiaries is subject to periodic examinations by its respective domiciliary state insurance regulators. The latest published examination reports issued by each such insurance department did not raise any material issues or adjustments.

Investment Powers

The Company's U.S. insurance subsidiaries are subject to laws and regulations that require diversification of their investment portfolios and limit the amount of investments in certain investment categories such as below investment grade bonds and real estate. Failure to comply with these laws and regulations may cause investments exceeding regulatory limitations to be treated as non-admitted assets for the purposes of measuring statutory surplus and in some circumstances would require divestiture of the non-qualifying assets.

Minimum Statutory Surplus and Capital

The Company's U.S. domiciled life insurance subsidiaries are required to have minimum statutory surplus and capital of various amounts, depending on the state in which they are licensed and the types of business they transact.

NAIC IRIS Ratios

The NAIC uses a set of financial relationships or "tests," known as the Insurance Regulatory Information System ("IRIS"), which are designed for the early identification of insurance companies which might warrant special attention by insurance regulatory authorities. Insurance companies submit data annually to the NAIC, which in turn analyzes the data utilizing 12 ratios, each with defined "usual ranges." Having ratios that fall outside the usual range does not necessarily indicate that a company experienced unfavourable results. An insurance company may fall out of the usual range for one or more ratios because of transactions that are favourable (such as large increases in surplus) or are immaterial or eliminated at the consolidated level. Each company's ratios are reviewed annually and are assigned a ranking by a team of examiners and financial analysts at the NAIC for the purpose of identifying companies that require immediate regulatory attention. The rankings are not reported to the companies and are only available to regulators.

Risk-Based Capital Requirements

In order to enhance the regulation of insurer solvency, state regulators have adopted the NAIC model law implementing RBC requirements for life insurance companies. The requirements are designed to monitor capital adequacy and to raise the level of protection that statutory surplus provides for policyholders. The model law measures four major areas of risk facing life insurers: (i) the risk of loss from asset defaults and asset fluctuation; (ii) the risk of loss from adverse mortality and morbidity experience; (iii) the risk of loss from mismatching of asset and liability cash flows due to changing interest rates; and (iv) general business risk. Insurers having less statutory surplus than required by the RBC model formula are subject to varying degrees of regulatory action depending on the level of capital inadequacy. Based on the formula adopted by the NAIC, each of the Company's U.S. insurance company subsidiaries exceeded the RBC capital requirements as at December 31, 2018.

Regulation of Shareholder Dividends and Other Payments from Insurance Subsidiaries

Manulife's ability to meet debt service obligations and pay operating expenses and shareholder dividends depends on the receipt of sufficient funds from its operating subsidiaries. Our U.S. operating subsidiaries are indirectly owned by Manufacturers Life. The payment of dividends by JHUSA is subject to restrictions set forth in the insurance laws of Michigan, its domiciliary state. Similarly, the payment of dividends by JHNY and JHLH is regulated by New York and Massachusetts insurance laws, respectively. In all three states, regulatory approval is required if proposed shareholder dividend distributions exceed certain thresholds. In addition, general regulations relating to an insurer's financial condition and solvency may also preclude or restrict the amount of dividends that may be paid by the Company's U.S. insurance subsidiaries.

Federal Securities and Commodity Laws

Certain of the Company's subsidiaries and certain investment funds, policies and contracts offered by them are subject to regulation under federal securities laws administered by the SEC and under certain state securities laws. Certain segregated funds of the Company's insurance subsidiaries are registered as investment companies under the *Investment Company Act of 1940*, as are certain other funds managed by subsidiaries of the Company. Interests in

segregated funds under certain variable annuity contracts and variable insurance policies issued by the Company's insurance subsidiaries are also registered under the U.S. *Securities Act of 1933*. Each of John Hancock Distributors LLC and John Hancock Funds, LLC is registered as a broker-dealer under the U.S. Securities Exchange Act of 1934 and each is a member of, and subject to regulation by, the Financial Industry Regulatory Authority.

Each of John Hancock Advisers, LLC, Manulife Asset Management (U.S.) LLC, Hancock Natural Resource Group, Inc., Hancock Venture Partners, Inc., Hancock Capital Investment Management, LLC, John Hancock Investment Management Services, LLC, Manulife Asset Management (North America) Limited and John Hancock Personal Financial Services, LLC is an investment adviser registered under the U.S. *Investment Advisers Act of 1940*. Certain investment companies advised or managed by these subsidiaries are registered with the SEC under the *Investment Company Act of 1940* and the shares of certain of these entities are qualified for sale in certain states in the United States and the District of Columbia. All aspects of the investment advisory activities of the Company's subsidiaries are subject to various federal and state laws and regulations in jurisdictions in which they conduct business. These laws and regulations are primarily intended to benefit investment advisory clients and investment company shareholders and generally grant supervisory agencies broad administrative powers, including the power to limit or restrict the carrying on of business for failure to comply with such laws and regulations. In such event, the possible sanctions that may be imposed include the suspension of individual employees, limitations on the activities in which the investment advisor may engage, suspension or revocation of the investment advisor's registration as an advisor, censure and fines.

The *Commodity Exchange Act* may regulate certain of the Company's segregated funds and registered funds as a "commodity pool", and certain of the Company's registered advisers as a "commodity pool operator" or a "commodity trading advisor".

State Guaranty Funds

All states of the United States have insurance guaranty fund laws requiring life insurance companies doing business in the state to participate in a guaranty association which, like Assuris in Canada, is organized to protect policyholders against loss of benefits in the event of an insolvency or wind-up of a member insurer. These associations levy assessments (up to prescribed limits) on the basis of the proportionate share of premiums written by member insurers in the lines of business in which the impaired or insolvent insurer is engaged. Assessments levied against the Company in each of the past five years have not been material. While the amount of any future assessments by guaranty funds cannot be predicted with certainty, the Company believes, based upon a review of the current significant insolvency proceedings of insurers located in states where the Company conducts business, that future guaranty association assessments for insurer insolvencies will not have a material adverse effect on the Company's liquidity and capital resources.

Employee Retirement Income Security Act of 1974 ("ERISA") Considerations

Fiduciaries of employee benefit plans that are governed by ERISA are subject to regulation by the U.S. Department of Labor. ERISA regulates the activities of a fiduciary of an employee benefit plan covered by that law, including an investment manager or advisor with respect to the plan's assets. Certain of the Company's subsidiaries offer personalized retirement investment advice to ERISA plan participants through the use of digital capabilities. Such service may cause such subsidiaries to be deemed fiduciaries under applicable law or regulation.

The Company's subsidiaries also provide a variety of services to employee benefit plans. The provision of such services may cause the Company and its subsidiaries to be a "party in interest," as such term is defined in ERISA and the Internal Revenue Code of 1986, as amended (the "Code"), with respect to such plans. Certain transactions between parties in interest and those plans are prohibited by ERISA and the Code. Unless a statutory or administrative exemption is available, severe penalties and excise taxes are imposed by ERISA and the Code on fiduciary breaches and prohibited transactions.

ASIA

In Asia, local insurance authorities supervise and monitor the Company's business and financial condition in each of the countries and territories in which the Company operates. The Company is also required to meet specific minimum working and regulatory capital requirements and is subject to regulations governing the investment of such capital in each of these jurisdictions. Hong Kong and Japan are the regulatory jurisdictions governing Manulife's most significant operations in Asia.

Hong Kong

In Hong Kong, the authority and responsibility for supervision of the insurance industry is vested in the Insurance Authority ("IA") under the amended *Insurance Ordinance, Cap. 41* (the "Insurance Ordinance", formerly known as the Insurance Companies Ordinance). Most of the amendments to the Insurance Ordinance came into force in December 2015 and June 2017. The remaining amendments, relating to the centralized regulation on intermediaries, are expected to be implemented in mid-2019.

The Chief Executive of the Government of the Hong Kong Special Administrative Region appoints the members of the IA for the purposes of the Insurance Ordinance. The Insurance Ordinance provides that no person shall carry on any insurance business in or from Hong Kong except a company authorized to do so by the IA, Lloyd's of the United Kingdom or an association of underwriters approved by the IA. The Insurance Ordinance stipulates certain requirements for authorized insurers, including robust corporate governance, enhanced "fit and proper person" requirements for directors, controllers and several key persons in control functions such as financial control, compliance, risk management, intermediary management, actuary and internal audit, and minimum capital and solvency margin requirements, adequate reinsurance arrangement requirements and statutory reporting requirements. The Insurance Ordinance also confers powers of inspection, investigation and intervention on the IA for the protection of policyholders and potential policyholders.

The IA has residual power to appoint an advisor or a manager to any authorized insurer if the IA considers such appointment to be desirable for the protection of policyholders or potential policyholders against the risk that the insurer may be unable to meet its liabilities or to fulfill the reasonable expectations of policyholders or potential policyholders and that, in the IA's opinion, the exercise of other interventionary powers conferred by the Insurance Ordinance would not be appropriate to safeguard the interests of policyholders or potential policyholders. In such circumstances, the advisor or manager appointed by the IA will have management control of the insurer.

In Hong Kong, the Company's life insurance business is conducted through a branch of a wholly owned Bermuda subsidiary, Manulife (International) Limited, which is licensed to carry on the business of "long-term" insurance.

Long-term insurance companies are required under the Insurance Ordinance to maintain certain solvency margins. The required solvency margin is the aggregate of two components: (i) a percentage of the mathematical reserves; and (ii) a percentage of the capital at risk as prescribed under the Insurance (Margin of Solvency) Rules (Cap.41F), enacted pursuant to the Insurance Ordinance. For a long-term insurance company, the value of its assets must not be less than the amount of its liabilities by the required solvency margin, subject to a minimum of Hong Kong $2 million. Compliance with the solvency margin requirements is reported annually to the IA. Currently, all solvency margin requirements are being met.

The sale of mutual funds and the issuance of advertisements, invitations or documents in relation to collective investment schemes which contain an invitation to acquire an interest are subject to Hong Kong securities laws administered by the Securities and Futures Commission. The sale of pension fund products is subject to the supervision of the Mandatory Provident Fund Schemes Authority. The sales of investment-linked assurance and group life and health products are subject to the supervision of the IA.

Japan

Life insurance companies in Japan, including Manulife Life Insurance Company ("Manulife Japan"), are governed by the *Insurance Business Law* and the regulations issued thereunder (the "IB Law"). The IB Law sets out a

comprehensive regulatory regime for Japanese life insurers, including such matters as capital and solvency requirements, powers of regulatory intervention, new insurance products and restrictions on shareholder dividends and distributions. The administration and application of the IB Law is supervised by the Financial Services Agency ("FSA"). The IB Law provides for certain rules with respect to the approval of new insurance products and the setting of premium levels.

Revisions to the IB Law incorporate obligations relating to sales of insurance products such as understanding customer's intention and provision of relevant information to customers, as well as agencies' obligation to develop their own controls framework including non-exclusive agencies' obligation to recommend a product based on a comparison with similar products. The revised law came into effect on May 29, 2016.

The FSA published on March 30, 2017, Principles for Customer-Oriented Business Operations that recommend financial institutions, including insurers, among others, take the following actions: (1) Develop and make public a policy for a customer-oriented business; (2) Provide thorough disclosure of detailed fees and expenses of financial products to customers; (3) Provide important information in an easy to understand manner; and (4) Provide services suited to each customer. Manulife Japan established a policy as a "Customer Promise" and made it public on June 9, 2017 on its website.

Investment managers in Japan, including Manulife Asset Management (Japan) Limited, are governed by the *Financial Instruments and Exchange Act (Japan)*, and the regulations issued thereunder (the "FIEA"). The FIEA sets out a comprehensive regulatory regime for investment managers that do business in Japan, including the registration requirement for investment managers, filing requirements for public offerings of investment trusts, behaviour regulations and other matters. Persons who conduct investment management business in Japan (management of investment trusts and/or discretionary investment management business) must be registered with the FSA under the FIEA. The registered investment managers are supervised by the FSA or local financial bureaus. The *Investment Trust and Investment Corporation Act (Japan)* provides structural requirements for investment trust funds organized within Japan and also governs managers of such domestic investment trusts.

Restrictions on Shareholder Dividends

In Asia, insurance and company laws in the jurisdictions in which the Company operates provide for specific restrictions on the payment of shareholder dividends and other distributions by the Company's subsidiaries, or impose solvency or other financial tests, which could affect the ability of these subsidiaries to pay dividends in certain circumstances.

GENERAL DESCRIPTION OF CAPITAL STRUCTURE

MFC has authorized share capital consisting of an unlimited number of common shares ("Common Shares"), an unlimited number of Class A Shares ("Class A Shares"), an unlimited number of Class B Shares ("Class B Shares") and an unlimited number of Class 1 Shares ("Class 1 Shares") (collectively, the Class A Shares, Class B Shares and Class 1 Shares are "Preferred Shares").

As of December 31, 2018, MFC had the following Common Shares, Class A Shares and Class 1 Shares issued:

Common Shares	1,971,002,948
Class A Shares Series 2	14,000,000
Class A Shares Series 3	12,000,000
Class 1 Shares Series 3	6,335,831
Class 1 Shares Series 4	1,664,169
Class 1 Shares Series 5	8,000,000
Class 1 Shares Series 7	10,000,000
Class 1 Shares Series 9	10,000,000
Class 1 Shares Series 11	8,000,000
Class 1 Shares Series 13	8,000,000
Class 1 Shares Series 15	8,000,000

Class 1 Shares Series 17	14,000,000
Class 1 Shares Series 19	10,000,000
Class 1 Shares Series 21	17,000,000
Class 1 Shares Series 23	19,000,000
Class 1 Shares Series 25	10,000,000

MFC has authorized but not issued Class 1 Shares Series 6, Class 1 Shares Series 8, Class 1 Shares Series 10, Class 1 Shares Series 12, Class 1 Shares Series 14, Class 1 Shares Series 16, Class 1 Shares Series 18, Class 1 Shares Series 20, Class 1 Shares Series 22, Class 1 Shares Series 24, and Class 1 Shares Series 26.

Certain Provisions of the Class A Shares as a Class

The following is a summary of certain provisions attaching to the Class A Shares as a class.

Priority

Each series of Class A Shares ranks on a parity with every other series of Class A Shares and every series of Class 1 Shares with respect to dividends and return of capital. The Class A Shares shall be entitled to a preference over the Class B Shares, the Common Shares and any other shares ranking junior to the Class A Shares with respect to priority in payment of dividends and in the distribution of assets in the event of the liquidation, dissolution or winding-up of MFC, whether voluntary or involuntary, or any other distribution of the assets of MFC among its shareholders for the specific purpose of winding up its affairs.

Certain Provisions of the Class B Shares as a Class

The following is a summary of certain provisions attaching to the Class B Shares as a class.

Priority

Each series of Class B Shares ranks on a parity with every other series of Class B Shares with respect to dividends and return of capital. The Class B Shares shall rank junior to the Class A Shares and the Class 1 Shares with respect to priority in payment of dividends and in the distribution of assets in the event of the liquidation, dissolution or winding up of MFC, whether voluntary or involuntary, or any other distribution of the assets of MFC among its shareholders for the specific purpose of winding up its affairs, but the Class B Shares shall be entitled to a preference over the Common Shares and any other shares ranking junior to the Class B Shares with respect to priority in payment of dividends and the distribution of assets in the event of the liquidation, dissolution or winding up of MFC, whether voluntary or involuntary, or any other distribution of the assets of MFC among its shareholders for the specific purpose of winding up its affairs.

Certain Provisions of the Class 1 Shares as a Class

The following is a summary of certain provisions attaching to the Class 1 Shares as a class.

Priority

Each series of Class 1 Shares ranks on a parity with every other series of Class 1 Shares and every series of Class A Shares with respect to dividends and return of capital. The Class 1 Shares shall be entitled to a preference over the Class B Shares, the Common Shares and any other shares ranking junior to the Class 1 Shares with respect to priority in payment of dividends and in the distribution of assets in the event of the liquidation, dissolution or winding-up of MFC, whether voluntary or involuntary, or any other distribution of the assets of MFC among its shareholders for the specific purpose of winding up its affairs.

Certain Provisions Common to the Class A Shares, Class B Shares and Class 1 Shares

The following is a summary of certain provisions attaching to the Class A Shares as a class, to the Class B Shares as a class and to the Class 1 Shares as a class.

Directors' Right to Issue in One or More Series

The Class A Shares, Class B Shares and Class 1 Shares may be issued at any time and from time to time in one or more series. Before any shares of a series are issued, the Board shall fix the number of shares that will form such series, if any, and shall, subject to any limitations set out in the by-laws of MFC or in the ICA, determine the designation, rights, privileges, restrictions and conditions to be attached to the Class A Shares, Class B Shares or Class 1 Shares as the case may be, of such series, the whole subject to the filing with the Superintendent of the particulars of such series, including the rights, privileges, restrictions and conditions determined by the Board.

Summaries of the terms for each series of the Class A Shares and Class 1 Shares that have been issued or authorized for issuance are contained in the prospectuses relating to such shares, which are available on SEDAR.

Voting Rights of Preferred Shares

Except as hereinafter referred to or as required by law or as specified in the rights, privileges, restrictions and conditions attached from time to time to any series of Class A Shares, Class B Shares or Class 1 Shares, the holders of such Class A Shares, Class B Shares or Class 1 Shares as a class shall not be entitled as such to receive notice of, to attend or to vote at any meeting of the shareholders of MFC.

Amendment with Approval of Holders of Preferred Shares

The rights, privileges, restrictions and conditions attached to each of the Class A Shares, Class B Shares and Class 1 Shares as a class may be added to, changed or removed but only with the approval of the holders of such class of Preferred Shares given as hereinafter specified.

Approval of Holders of Preferred Shares

The approval of the holders of a class of Preferred Shares to add to, change or remove any right, privilege, restriction or condition attaching to such class of Preferred Shares as a class or in respect of any other matter requiring the consent of the holders of such class of Preferred Shares may be given in such manner as may then be required by law, subject to a minimum requirement that such approval be given by resolution signed by all the holders of such class of Preferred Shares or passed by the affirmative vote of at least two-thirds (2/3) of the votes cast at a meeting of the holders of such class of Preferred Shares duly called for that purpose. Notwithstanding any other condition or provision of any class of Preferred Shares, the approval of the holders of any class, voting separately as a class or series, is not required on a proposal to amend the by-laws of MFC to:

(i) increase or decrease the maximum number of authorized Class A Shares, Class B Shares or Class 1 Shares, as the case may be, or increase the maximum number of authorized shares of a class of shares having rights or privileges equal or superior to such class of Preferred Shares;

(ii) effect the exchange, reclassification or cancellation of all or any part of the Class A Shares, Class B Shares or Class 1 Shares, as the case may be; or

(iii) create a new class of shares equal to or superior to the Class A Shares, the Class B Shares or the Class 1 Shares, as the case may be.

The formalities to be observed with respect to the giving of notice of any such meeting or any adjourned meeting, the quorum required therefor and the conduct thereof shall be those from time to time required by the ICA as in force at the time of the meeting and those, if any, prescribed by the by-laws or the administrative resolutions of MFC with respect to meetings of shareholders. On every poll taken at every meeting of the holders of a class of Preferred Shares as a class, or at any joint meeting of the holders of two or more series of a class of Preferred Shares, each holder of such class of Preferred Shares entitled to vote thereat shall have one vote in respect of each relevant Preferred Share held.

Certain Provisions of the Common Shares as a Class

The authorized common share capital of MFC consists of an unlimited number of Common Shares without nominal or par value. Each holder of Common Shares is entitled to receive notice of and to attend all meetings of the shareholders of MFC and is entitled to one vote for each share held except for meetings at which only holders of another specified class or series of shares of MFC are entitled to vote separately as a class or series. The holders of Common Shares are entitled to receive dividends as and when declared by the Board, subject to the preference of the holders of Class A Shares, Class B Shares, Class 1 Shares and any other shares ranking senior to the Common Shares with respect to priority in payment of dividends. After payment to the holders of Class A Shares, Class B Shares, Class 1 Shares and any other shares ranking senior to Common Shares with respect to priority in the distribution of assets in the event of the liquidation, dissolution or winding-up of MFC, the holders of Common Shares shall be entitled to receive prorated the net assets of MFC remaining, after the payment of all creditors and liquidation preferences, if any, that pertains to shareholders.

DIVIDENDS

The declaration and payment of dividends and the amount thereof is subject to the discretion of the Board and is dependent upon the results of operations, financial condition, cash requirements and future prospects of, and regulatory restrictions on the payment of dividends by, the Company and other factors deemed relevant by the Board.

Since MFC 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.

Pursuant to an agreement made between MFC, Manufacturers Life, CIBC Mellon Trust Company (“CIBC Mellon”) and Manulife Financial Capital Trust II (a subsidiary of Manufacturers Life) (the “Trust II”), MFC and Manufacturers Life have covenanted for the benefit of holders of the outstanding Manulife Financial Capital 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 Manufacturers Life 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, Manufacturers Life 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 Manufacturers Life which at that time: (a) have been issued to the public (excluding any preferred shares of Manufacturers Life held beneficially by affiliates of Manufacturers Life); (b) are listed on a recognized stock exchange; and (c) have an aggregate liquidation entitlement of at least $200 million, provided 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.

MFC has paid the following cash dividends in the period from January 1, 2016 to December 31, 2018:

Type of Shares	2018	2017	2016
Common Shares	$0.91	$0.82	$0.74
Preferred Shares			
Class A Shares Series 2	$1.1625	$1.1625	$1.1625
Class A Shares Series 3	$1.1250	$1.1250	$1.1250
Class 1 Shares Series 3	$0.5445	$0.5445	$0.7973
Class 1 Shares Series 4[3]	$0.6536	$0.4918	$0.2431
Class 1 Shares Series 5	$0.9728	$0.9728	$1.1000
Class 1 Shares Series 7	$1.0780	$1.0960	$1.1500
Class 1 Shares Series 9	$1.0878	$1.0969	$1.1000
Class 1 Shares Series 11	$1.1371	$1.0000	$1.0000
Class 1 Shares Series 13	$0.9884	$0.9500	$0.9500
Class 1 Shares Series 15	$0.9750	$0.9750	$0.9750
Class 1 Shares Series 17	$0.9750	$0.9750	$0.9750
Class 1 Shares Series 19	$0.9500	$0.9500	$0.9500
Class 1 Shares Series 21	$1.4000	$1.4000	$1.1411
Class 1 Shares Series 23[4]	$1.2125	$1.2980	—
Class 1 Shares Series 25[5]	$0.9706	—	—

The 2018, 2017 and 2016 dividends on the Common Shares, the Class A Shares and the Class 1 Shares were paid quarterly in March, June, September and December.

CONSTRAINTS ON OWNERSHIP OF SHARES

The ICA contains restrictions on the purchase or other acquisition, issue, transfer and voting of the shares of MFC. Pursuant to these restrictions, no person is permitted to acquire any shares of MFC if the acquisition would cause the person to have a “significant interest” in any class of shares of MFC, unless the prior approval of the Minister of Finance (Canada) is obtained. The restrictions also prohibit any person from becoming a “major shareholder” of MFC. In addition, MFC is not permitted to record in its securities register any transfer or issue of shares if the transfer or issue would cause the person to breach the ownership restrictions. For these purposes, a person has a significant interest in a class of shares of MFC where the aggregate of any shares of that class beneficially owned by that person, any entity controlled by that person and by any person associated or acting jointly or in concert with that person exceeds 10% of all the outstanding shares of that class of shares of MFC. A person is a major shareholder if the aggregate of any shares in a class of voting shares held by that person and by any entity controlled by that person exceeds 20% of the outstanding shares of that class, or, for a class of non-voting shares, a holding exceeds 30% of that class. If a person contravenes any of these restrictions, the Minister of Finance may, by order, direct such person to dispose of all or any portion of those shares. In addition, the ICA prohibits life insurance companies, including MFC, from recording in its securities register a transfer or issue of any share to Her Majesty in right of Canada or of a province, an agent or agency of Her Majesty, a foreign government or an agent or agency of a foreign government and provides further that no person may exercise the voting rights attached to those shares of an insurance company. The ICA exempts from such constraints certain foreign financial institutions which are controlled by foreign governments and eligible agents provided certain conditions are satisfied.

Under applicable insurance laws and regulations in Michigan, New York and Massachusetts, no person may acquire control of any of the Company’s insurance company subsidiaries domiciled in any such state without obtaining prior approval of such state’s insurance regulatory authority. Under applicable laws and regulations, any person acquiring, directly or indirectly, 10% or more of the voting securities of any other person is presumed to have acquired “control” of such person. Thus, any person seeking to acquire 10% or more of the voting securities of MFC must obtain the

3 On June 20, 2016, MFC converted 1,664,169 Class 1 Shares Series 3 into 1,664,169 Class 1 Shares Series 4.
4 Initial dividend of $0.388664 per share paid on March 19, 2017, per Prospectus Supplement dated November 15, 2016.
5 Initial dividend of $0.383082 per share paid on June 19, 2018, per Prospectus Supplement dated February 12, 2018.

prior approval of the insurance regulatory authorities in certain states including Michigan, Massachusetts and New York, or must demonstrate to the relevant insurance regulator's satisfaction that the acquisition of such securities will not give them control of MFC. Under state law, the failure to obtain such prior approval would entitle MFC or the insurance regulatory authorities to seek judicial injunctive relief, including enjoining the proposed acquisition or the voting of the acquired securities at any meeting of shareholders.

RATINGS

Credit rating agencies publish financial strength ratings on life insurance companies that are indicators of an insurance company's ability to meet contract holder and policyholder obligations. Credit rating agencies also assign credit ratings, which are indicators of an issuer's ability to meet the terms of its obligations in a timely manner and are important factors in a company's overall funding profile and ability to access external capital.

Ratings are important factors in establishing the competitive position of insurance companies, maintaining public confidence in products being offered, and determining the cost of capital. A ratings downgrade, or the potential for such a downgrade could, among other things: increase our cost of capital and limit our access to the capital markets; cause some of our existing liabilities to be subject to acceleration, additional collateral support, changes in terms, or additional financial obligations; result in the termination of our relationships with broker-dealers, banks, agents, wholesalers and other distributors of our products and services; unfavourably impact our ability to execute on our hedging strategy; materially increase the number of surrenders, for all or a portion of the net cash values, by the owners of policies and contracts we have issued, and materially increase the number of withdrawals by policyholders of cash values from their policies; and reduce new sales. Any of these consequences could adversely affect our results of operations and financial condition.

The following table summarizes, by type of securities, the ratings, outlook and ranking that MFC has received from approved rating organizations on its outstanding securities as at February 11, 2019. Note that some of the approved rating organizations may not have assigned ratings for all of the outstanding classes or series of instruments under each security type.

	A.M. Best Company ("A.M. Best")		DBRS Limited ("DBRS")		Fitch Ratings Inc. ("Fitch")		S&P Global Ratings ("S&P")	
Securities	Rating/Outlook	Rank	Rating/Outlook	Rank	Rating/Outlook	Rank	Rating/Outlook	Rank
Preferred Shares	bbb / Stable	9 of 21	Pfd-2/ Stable	5 of 16	BBB- / Stable	10 of 19	P-2 (High) / BBB+ / Stable	4 of 18 6 of 20
Medium Term Notes and Senior Debt	a- / Stable	7 of 21	A/ Stable	6 of 26	A- / Stable	7 of 19	A / Stable	6 of 22
Subordinated Debt	bbb+ / Stable	8 of 21	A (low) / Stable	7 of 26	BBB+ / Stable	8 of 19	A- / Stable	7 of 22

The security ratings accorded by the rating organizations are not a recommendation to purchase, hold or sell these securities and may be subject to revision or withdrawal at any time by the rating organizations. Security ratings are intended to provide investors with an independent measure of the credit quality of an issue of securities. The Company provides certain rating agencies with confidential, in-depth information in support of the rating process.

The Company has paid customary rating fees to DBRS, Fitch and S&P in connection with some or all of the above-mentioned ratings. In addition, the Company has made customary payments in respect of certain other services provided to the Company by each of A.M. Best, DBRS, Fitch, and S&P during the last two years.

A.M. Best Ratings

A.M. Best assigns ratings for preferred shares and debt in a range from “aaa” to “c”. These ratings provide an opinion of an entity’s ability to meet ongoing financial obligations to security holders when due, and reflects the risk that an issuer may not meet its contractual obligations. The modifiers plus (+) or minus (-) may be appended to a rating to denote a gradation within the category to indicate whether credit quality is near the top or bottom of a particular rating category. Rating outlooks may be positive, stable, or negative, indicating the potential future direction a rating may move over a 36-month period. The Company’s current rating outlook is stable.

MFC’s Class A Shares and Class 1 Shares have been assigned a “bbb” rating. The “bbb” ratings denotes a good ability to meet the terms of the obligation, however the issue is more susceptible to changes in economic or other conditions.

MFC’s Medium Term Notes and Senior Debt have been assigned an “a-” rating, which denotes an excellent ability to meet the terms of the obligation.

MFC’s Subordinated Debt has been assigned a “bbb+” rating, which denotes a good ability to meet the terms of the obligation, however the issue is more susceptible to changes in economic or other conditions.

DBRS Ratings

DBRS assigns ratings for preferred shares in a range from “Pfd-1” to “D”. The DBRS preferred share rating scale is used in the Canadian securities market and is meant to give an indication of the risk that a borrower will not fulfill its full obligations in a timely manner, with respect to both dividend and principal commitments. DBRS assigns ratings for long-term obligations in a range from “AAA” to “D”. The scale provides an opinion on the risk that an issuer will fail to satisfy its financial obligations in accordance with the terms under which an obligation has been issued. Every DBRS rating is based on quantitative and qualitative considerations relevant to the borrowing entity. Some rating categories are denoted by the subcategories “high” and “low”. The absence of either a “high” or “low” designation indicates the rating is in the middle of the category. Each DBRS rating is appended with one of three rating trends – “Positive”, “Stable”, or “Negative”. The rating trend indicates the direction in which DBRS considers the rating may move if present circumstances continue, or in some cases, unless challenges are addressed; a positive or negative trend does not necessarily indicate that a rating change is imminent. The Company’s current ratings trend is stable.

MFC’s Class A Shares and Class 1 Shares have been assigned a “Pfd-2” rating as they are considered to be of satisfactory credit quality. Protection of dividends and principal is still substantial, but earnings, the balance sheet and coverage ratios are not as strong as “Pfd-1” rated companies.

MFC’s Medium Term Notes and Senior Debt have been assigned an “A” rating, while MFC’s Subordinated Debt has been assigned an “A (low)” rating. An obligation rated “A” or “A (low)” is of good credit quality, where the capacity for the payment of financial obligations is substantial, but of lesser credit quality than “AA”. The Company may be vulnerable to future events, but qualifying negative factors are considered manageable.

Fitch Ratings

Fitch assigns ratings for preferred shares and debt in a range from “AAA” to “C” and these ratings provide an opinion on the relative ability of an entity to meet financial commitments, such as interest, preferred dividends, repayment of principal, insurance claims or counterparty obligations. These ratings are used by investors as indications of the likelihood of receiving the money owed to them in accordance with the terms on which they invested. These ratings do not directly address any risk other than credit risk. In particular, ratings do not deal with the risk of a market value loss on a rated security due to changes in interest rates, liquidity and other market considerations. The modifiers “+” or “-” may be appended to a rating to denote relative status within major rating categories. Rating outlooks indicate the direction a rating is likely to move over a one- to two-year period. Rating outlooks may be positive, stable, negative or evolving. The Company’s current rating outlook is stable.

MFC's Class A Shares and Class 1 Shares have been assigned a"BBB-" rating. The Company's capacity for payment of financial commitments is considered adequate but adverse business or economic conditions are more likely to impair this capacity.

MFC's Medium Term Notes and Senior Debt have been assigned an"A-" rating. This rating denotes expectations of low credit risk. The capacity for payment of financial commitments is considered strong. This capacity may, nevertheless, be more vulnerable to adverse business or economic conditions than is the case for higher ratings.

MFC's Subordinated Debt have been assigned a "BBB+" rating. This rating indicates that expectations of default risk are currently low. The capacity for payment of financial commitments is considered adequate but adverse business or economic conditions are more likely to impair this capacity.

S&P Ratings

S&P assigns ratings for Canadian preferred shares in a range from"P-1" to "D" and these ratings are a forward-looking opinion about the creditworthiness of an obligor with respect to a specific preferred share obligation issued in the Canadian market, relative to preferred shares issued by other issuers in the Canadian market. There is a direct correspondence between the specific ratings assigned on the Canadian preferred share scale and the various rating levels on the global debt rating scale of S&P. It is the practice of S&P to present an issuer's preferred share ratings on both the global ratings scale and the Canadian national scale when listing the ratings for a particular issuer. S&P's Canadian scale preferred share ratings may be modified by the addition of "High" or "Low" to show relative standing within the major rating categories. S&P's global scale preferred share ratings may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories. Rating outlooks assess the potential direction of a long-term credit rating over the intermediate term (typically six months to two years). Rating outlooks may be positive, negative, stable, developing or not meaningful. The Company's current rating outlook is stable.

S&P assigns ratings for long-term obligations in a range from "AAA" to "D". These ratings provide a forward-looking opinion about the creditworthiness of an obligor with respect to a specific financial obligation, a specific class of financial obligations, or a specific financial program (including ratings on medium-term note programs and commercial paper programs). S&P's long-term issue credit ratings may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories. Rating outlooks may be positive, negative, stable, developing or not meaningful. The Company's current rating outlook is stable.

MFC's Class A Shares and Class 1 Shares have been assigned a"P-2 (High)" rating on the Canadian scale, which corresponds to a "BBB+" rating on the global scale. The "P-2 (High)" rating denotes that the specific obligation exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.

MFC's Medium Term Notes and Senior Debt have been assigned an "A" rating, while its Subordinated Debt has been assigned an "A-" rating. An obligation rated "A" or"A-" is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. However, the obligor's capacity to meet its financial commitment on the obligation is still strong.

MARKET FOR SECURITIES

MFC's Common Shares are listed for trading under the symbol "MFC" on the Toronto Stock Exchange ("TSX"), the New York Stock Exchange ("NYSE"), and the Philippine Stock Exchange and under "0945" on The Stock Exchange of Hong Kong. The Class A Shares Series 2 and Class A Shares Series 3 preferred shares are listed for trading on the TSX under the symbol "MFC.PR.B" and "MFC.PR.C", respectively. The Class 1 Shares Series 3, Class 1 Shares Series 4, Class 1 Shares Series 5, Class 1 Shares Series 7, Class 1 Shares Series 9, Class 1 Shares Series 11, Class 1 Shares Series 13, Class 1 Shares Series 15, Class 1 Shares Series 17, Class 1 Shares Series 19, Class 1 Shares Series 21, Class 1 Shares Series 23 and Class 1 Shares Series 25 preferred shares are listed for trading on

the TSX under the symbol “MFC.PR.F”, “MFC.PR.P”, “MFC.PR.G”, “MFC.PR.H”, “MFC.PR.I”, “MFC.PR.J”, “MFC.PR.K”, “MFC.PR.L”, “MFC.PR.M”, “MFC.PR.N”, “MFC.PR.O”, “MFC.PR.R” and “MFC.PR.Q”, respectively.

Trading Price and Volume

The following table sets out the intra-day price range and trading volume of the Common Shares on the TSX and the NYSE for the period indicated.

	TSX			NYSE		
2018	High (C$)	Low (C$)	Volume (000s)	High (U.S.$)	Low (U.S.$)	Volume (000s)
January	23.82	22.28	77,877	18.17	16.61	12,229
February	25.09	23.00	95,456	20.38	18.34	20,065
March	24.26	22.87	85,152	18.75	17.69	17,739
April	24.05	22.44	64,160	18.75	17.58	14,465
May	24.64	22.67	80,238	19.22	17.62	12,714
June	24.69	23.05	58,874	18.83	17.39	8,842
July	23.81	22.88	51,575	18.23	17.37	9,135
August	24.26	22.85	58,526	18.73	17.50	10,587
September	23.85	22.42	64,909	18.48	17.25	10,978
October	23.04	19.41	138,074	17.97	14.82	31,130
November	22.68	20.44	102,282	17.31	15.63	19,683
December	22.35	18.33	127,629	16.90	13.34	13,866

The following tables set out the intra-day price range and trading volume of the Class A Shares Series 2 and Series 3 preferred shares and the Class 1 Shares Series 3, Series 4, Series 5, Series 7, Series 9, Series 11, Series 13, Series 15, Series 17, Series 19, Series 21, Series 23 and Series 25 preferred shares on the TSX for the period indicated.

	TSX – Class A Shares Series 2			TSX – Class A Shares Series 3		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	22.76	22.19	143	21.95	21.45	204
February	22.90	21.75	220	22.17	21.05	169
March	22.12	21.44	345	21.51	20.75	313
April	22.09	21.65	120	21.45	21.00	122
May	22.11	21.45	371	21.46	20.83	145
June	22.08	21.53	284	21.45	20.86	59
July	22.34	21.85	210	21.83	21.05	115
August	22.06	21.64	98	21.37	20.69	266
September	22.23	21.78	59	21.30	20.92	131
October	21.98	19.66	210	21.15	19.09	281
November	20.81	19.50	227	20.14	18.81	225
December	20.68	19.00	265	19.99	18.45	293

	TSX – Class 1 Shares Series 3			TSX – Class 1 Shares Series 4		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	15.47	14.32	192	14.90	13.99	100
February	19.56	18.80	169	20.15	19.15	86
March	19.27	18.60	157	20.24	19.60	44
April	18.99	18.53	60	20.98	18.61	37
May	20.31	18.80	311	21.33	19.20	18
June	19.41	18.80	69	20.19	19.30	59

	TSX – Class 1 Shares Series 3			TSX – Class 1 Shares Series 4		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
July	19.43	18.92	153	21.14	19.75	8
August	19.38	17.72	92	20.09	19.56	26
September	18.88	18.46	56	20.17	19.50	8
October	18.98	16.92	290	20.19	18.23	23
November	17.94	15.28	146	19.30	16.75	18
December	15.76	13.42	318	16.93	13.81	20

	TSX – Class 1 Shares Series 5			TSX – Class 1 Shares Series 7		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	23.28	21.85	473	24.85	23.19	178
February	25.30	24.19	219	25.38	24.45	305
March	24.68	24.14	156	25.15	24.48	278
April	24.66	24.13	64	25.56	24.75	258
May	24.80	23.95	91	25.50	25.00	714
June	24.43	23.52	113	25.32	25.08	63
July	24.75	24.25	54	26.02	25.08	73
August	24.87	24.45	108	26.01	25.18	87
September	24.81	24.41	64	25.45	25.10	43
October	24.88	22.85	330	25.50	23.66	293
November	24.06	20.47	115	24.62	21.10	189
December	21.21	18.40	164	22.60	19.69	253

	TSX – Class 1 Shares Series 9			TSX – Class 1 Shares Series 11		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	23.42	21.84	299	22.62	21.36	282
February	25.38	23.93	117	25.17	24.58	284
March	24.92	24.40	134	25.12	24.70	225
April	25.00	24.51	134	25.00	24.59	233
May	25.25	24.58	134	25.63	24.56	183
June	25.04	24.60	78	24.96	24.68	127
July	25.20	23.33	254	25.25	24.80	130
August	25.27	24.89	79	25.49	24.96	268
September	25.13	24.75	134	25.19	24.93	280
October	25.20	22.84	342	25.41	23.13	334
November	24.05	20.55	169	24.42	21.17	131
December	21.57	19.23	398	22.16	19.44	201

	TSX – Class 1 Shares Series 13			TSX – Class 1 Shares Series 15		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	20.95	19.40	287	20.80	19.75	136
February	23.92	22.73	170	23.90	22.02	111
March	23.73	22.08	244	23.44	22.21	113
April	23.17	22.56	142	23.26	21.86	54
May	23.88	21.93	87	23.74	22.47	115
June	23.05	20.38	106	23.34	22.24	64

	TSX – Class 1 Shares Series 13			TSX – Class 1 Shares Series 15		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
July	23.38	22.43	78	23.59	22.23	56
August	23.50	22.88	273	23.47	22.41	62
September	23.21	22.39	102	23.24	22.25	36
October	23.44	21.76	215	23.37	20.91	198
November	22.28	19.10	269	21.97	18.65	121
December	20.85	17.63	202	19.71	16.96	210

	TSX – Class 1 Shares Series 17			TSX – Class 1 Shares Series 19		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	21.46	20.01	419	22.49	19.74	123
February	24.49	23.59	70	24.24	23.55	85
March	24.00	23.34	128	23.80	22.99	58
April	23.46	22.82	225	23.40	22.04	85
May	24.06	22.63	156	23.93	22.50	116
June	23.62	22.86	302	23.41	22.88	272
July	23.93	22.26	80	24.19	23.27	111
August	24.20	23.37	86	24.34	23.47	72
September	24.09	23.41	148	23.91	23.28	30
October	24.20	21.35	310	24.13	21.12	135
November	22.61	19.07	186	22.40	18.85	72
December	19.71	17.61	233	19.61	17.10	138

	TSX – Class 1 Shares Series 21			TSX – Class 1 Shares Series 23		
2018	High (C$)	Low (C$)	Volume (000s)	High (C$)	Low (C$)	Volume (000s)
January	27.14	26.20	225	25.82	25.08	1,837
February	26.80	26.20	266	26.19	25.50	265
March	26.50	26.19	220	25.97	25.50	251
April	26.76	26.26	339	26.39	25.77	301
May	26.79	26.14	130	26.29	25.78	295
June	26.67	26.19	361	26.06	25.76	248
July	26.67	26.30	122	25.99	25.75	265
August	26.74	26.23	180	26.38	25.75	415
September	26.50	26.17	228	26.11	25.70	182
October	26.41	25.51	437	26.05	24.96	581
November	26.24	25.24	495	25.66	23.99	197
December	26.11	25.08	300	25.25	22.77	356

	TSX – Class 1 Shares Series 25		
2018	High (C$)	Low (C$)	Volume (000s)
January	–	–	–
February	25.00	24.70	1,179
March	25.13	24.72	618
April	25.74	24.85	560
May	25.36	24.37	333
June	24.81	24.40	159
July	25.25	24.42	260

	TSX – Class 1 Shares Series 25		
2018	High (C$)	Low (C$)	Volume (000s)
August	25.29	24.77	209
September	25.06	24.30	141
October	24.97	22.60	469
November	23.97	19.99	164
December	21.31	19.06	523

LEGAL PROCEEDINGS AND REGULATORY ACTIONS

A description of certain legal proceedings to which the Company is a party can be found in the section entitled “Legal and Regulatory Proceedings” in Note 18 to our 2018 Consolidated Financial Statements.

Since January 1, 2018, (a) there have been no penalties or sanctions imposed against us by a Canadian securities regulatory authority, other than nominal late filing fees, or by a court relating to Canadian securities legislation, (b) there have been no other penalties or sanctions imposed by a court or regulatory body against us that would likely be considered important to a reasonable investor in making an investment decision, and (c) we have not entered into any settlement agreements before a court relating to Canadian securities legislation or with a Canadian securities regulatory authority.

DIRECTORS AND EXECUTIVE OFFICERS

DIRECTORS

The by-laws of MFC provide that the Board shall consist of a minimum of seven and a maximum of 30 Directors, with the exact number of Directors to be elected at any annual meeting of MFC to be fixed by the Directors prior to such annual meeting.

The following table sets forth the Directors of MFC, as of the date of this AIF, and for each Director, their province or state and country of residence, principal occupation, years as a director and membership on board committees.

Each Director is elected for a term of one year, expiring at the close of the next annual meeting of the Company. The next annual meeting will occur on May 2, 2019.

Name and Residence	Principal Occupation	Director Since	Board Committee Membership(1)
John M. Cassaday Ontario, Canada	Chairman of the Board, MFC and Manufacturers Life (2)	April 1993	CGNC (3)
Roy Gori Ontario, Canada	President and Chief Executive Officer, MFC and Manufacturers Life (4)	October 2017	N/A (4)
Ronalee H. Ambrose Alberta, Canada	Corporate Director (5)	September 2017	Audit CGNC
Joseph P. Caron British Columbia, Canada	President, Joseph Caron Incorporated (consulting firm)	October 2010	Audit CGNC
Susan F. Dabarno Ontario, Canada	Corporate Director	March 2013	MRCC Risk
Sheila S. Fraser Ontario, Canada	Corporate Director	November 2011	Audit (Chair) CGNC
Luther S. Helms Arizona, United States	Founder and Advisor, Sonata Capital Group (investment advisory firm)	May 2007	Audit CGNC

Name and Residence	Principal Occupation	Director Since	Board Committee Membership(1)
Tsun-yan Hsieh Singapore	Chairman, LinHart Group Pte Ltd. (consulting firm)	October 2011	MRCC Risk
P. Thomas Jenkins Georgetown, Cayman Islands	Chair, OpenText Corporation (enterprise information management company)	March 2015	MRCC Risk
Donald R. Lindsay British Columbia, Canada	President and Chief Executive Officer, Teck Resources Limited (diversified resources company)	August 2010	MRCC (Chair) Risk
John R.V. Palmer Ontario, Canada	Corporate Director	November 2009	Audit CGNC
C. James Prieur Illinois, United States	Corporate Director	January 2013	MRCC Risk (Chair)
Andrea S. Rosen Ontario, Canada	Corporate Director	August 2011	Audit CGNC (Chair)
Lesley D. Webster Florida, United States	President, Daniels Webster Capital Advisors (enterprise risk management consulting firm)	October 2012	MRCC Risk

Notes

(1) In this table, Audit means Audit Committee, CGNC means Corporate Governance and Nominating Committee, MRCC means Management Resources and Compensation Committee, and Risk means Risk Committee.

(2) John Cassaday was appointed Chairman of the Board effective May 4, 2018. Prior to May 2018, Mr. Cassaday was Vice-Chair of the Board, a position he had held since December 7, 2017. Prior to December 2017, Mr. Cassaday was a corporate director. Prior to March 2015, he was President and Chief Executive Officer, Corus Entertainment Inc., a broadcasting company.

(3) Mr. Cassaday is a member of the CGNC. However, in his capacity as Chairman, Mr. Cassaday attends the meetings of all committees whenever possible.

(4) Roy Gori is not a member of any committee but attends committee meetings at the invitation of the Chairman. From June 5, 2017 to October 1, 2017, Mr. Gori was President. From March 2015 to June 5, 2017 he was Senior Executive Vice President and General Manager, Asia. Prior to March 2015, he was Regional Head of Retail Banking, Asia Pacific/Head of Consumer Banking North Asia and Australia with Citigroup Pty Ltd.

(5) Prior to July 4, 2017, Ronalee Ambrose was a Member of Parliament of Canada and the former Leader of Canada's Official Opposition in the House of Commons and a former leader of the Conservative Party of Canada.

EXECUTIVE OFFICERS

The name, province or state and country of residence, and position of each of the executive officers of Manulife are set forth in the following table as of January 1, 2019.

Name and Residence	Position with Manulife
Roy Gori Ontario, Canada	President and Chief Executive Officer(1)
Michael J. Doughty Ontario, Canada	President and Chief Executive Officer, Manulife Canada(2)
Steven A. Finch Massachusetts, United States	Chief Actuary(3)
Gregory A. Framke New Jersey, United States	Chief Information Officer(4)
James D. Gallagher Massachusetts, United States	General Counsel(5)
Gretchen H. Garrigues Connecticut, United States	Global Chief Marketing Officer(6)
Marianne Harrison Massachusetts, United States	President and Chief Executive Officer, John Hancock(7)
Scott S. Hartz Massachusetts, United States	Global Head of General Account Investments(8)

Name and Residence	Position with Manulife
Rahim Hirji Ontario, Canada	Chief Risk Officer
Naveed Irshad Ontario, Canada	Head of North America Legacy Business[9]
Pamela O. Kimmet Georgia, United States	Chief Human Resources Officer[10]
Stephani E. Kingsmill Ontario, Canada	Senior Advisor to the Chief Executive Officer[11]
Paul R. Lorentz Ontario, Canada	Head, Global Wealth and Asset Management[12]
Linda P. Mantia Ontario, Canada	Chief Operating Officer[13]
Warren A. Thomson Ontario, Canada	Chief Investment Officer[14]
Anil Wadhwani Hong Kong Special Administrative Region of the People's Republic of China	President and Chief Executive Officer, Manulife Asia[15]
Philip J. Witherington Ontario, Canada	Chief Financial Officer[16]

Notes

(1) From June 5, 2017 to October 1, 2017, Roy Gori was President. From March 2015 to June 5, 2017 he was Senior Executive Vice President and General Manager, Asia. Prior to March 2015, he was Regional Head of Retail Banking, Asia Pacific/Head of Consumer Banking North Asia and Australia with Citigroup Pty Ltd.

(2) From May 24, 2017 to October 1, 2017, Michael Doughty was Executive Vice President and Interim General Manager, U.S. Division. Prior to May 24, 2017, he was Executive Vice President, John Hancock Insurance, U.S. Division.

(3) From April 2016 to January 1, 2018, Steve Finch was Executive Vice President and Chief Actuary. Prior to April 2016, he was Executive Vice President and Chief Financial Officer – U.S. Division, John Hancock Financial Services.

(4) Prior to January 2016, Gregory Framke was the Executive Vice President and Chief Operations Officer at E*Trade Financial Corp. including roles as Chief Operations Officer, Vice President Technology Strategy and Chief Information Officer.

(5) From October 2016 to December 2016, James Gallagher was Executive Vice President and Interim General Counsel. Prior to October 2016, Mr. Gallagher was Executive Vice President, General Counsel and Chief Administrative Officer, U.S. Division.

(6) From June 2014 to August 2016, Gretchen Garrigues was Senior Vice President and Chief Marketing Officer, First Data Corp. Prior to June 2014, Ms. Garrigues was Senior Managing Director, Global Strategic Marketing, GE Capital.

(7) From January 2013 to October 1, 2017, Marianne Harrison was Senior Executive Vice President and General Manager, Canadian Division.

(8) Scott Hartz has been appointed Chief Investment Officer effective March 1, 2019. Until such time as that appointment is effective he remains Global Head of General Account Investments.

(9) From May 2014 to January 1, 2018, Naveed Irshad was Senior Vice President and General Manager, Manulife Singapore. Prior to May 2014, he was Senior Vice President, Global Accounts at Reinsurance Group of America, Incorporated.

(10) From July 2016 to August 30, 2018, Pamela Kimmet was Chief Human Resources Officer, Cardinal Health Inc. Prior to July 2016, she was Senior Vice President, Human Resources, Coca-Cola Enterprises Inc.

(11) Prior to January 1, 2018, Stephani Kingsmill was Executive Vice President, Human Resources.

(12) Paul Lorentz has been appointed President and Chief Executive Officer, Global Wealth and Asset Management effective March 1, 2019. Until such time as that appointment is effective he remains Head, Global Wealth and Asset Management. Prior to October 1, 2017, Paul Lorentz was Executive Vice President and General Manager Retail (Individual Life and Wealth Management (Canadian Division)).

(13) Prior to October 2016, Linda Mantia was Executive Vice President of Digital, Payments and Cards, Royal Bank of Canada.

(14) Effective February 28, 2019, Warren Thomson will retire from Manulife.

(15) From July 2016 to November 13, 2017, Anil Wadhwani was Global Consumer Bank Operations Head at Citibank N.A. Prior to July 2016, he was Chief Executive Officer, Consumer and Commercial Bank, EMEA at Citibank N.A.

(16) From June 2017 to January 1, 2018, Philip Witherington was Executive Vice President and Interim General Manager, Asia. From May 2014 to June 2017, he was Executive Vice President, Chief Financial Officer, Asia Division. Prior to May 2014, he was Asia Pacific Head of Business Finance, Retail Banking and Wealth Management at The Hong Kong and Shanghai Bank Corporation Limited.

SHARE OWNERSHIP

The number of Common Shares held by Directors and executive officers of MFC as at December 31, 2018 was 638,139, which represented less than 1% of the outstanding Common Shares.

TRANSFER AGENT AND REGISTRAR

AST Trust Company (Canada) is the principal transfer agent and registrar for MFC's Common Shares. MFC's transfer agents and co-transfer agents are as follows (opposite their applicable jurisdictions):

Transfer Agent

Canada:	AST Trust Company (Canada) P.O. Box 700, Station B Montreal, Quebec, Canada, H3B 3K3 Toll Free: 1-800-783-9495 www.astfinancial.com/ca-en www.astfinancial.com/ca-fr

Co-Transfer Agents

United States:	American Stock Transfer & Trust Company, LLC P.O. Box 199036 Brooklyn, NY 11219 Toll Free: 1-800-249-7702 www.astfinancial.com
Philippines:	Rizal Commercial Banking Corporation Ground Floor, West Wing GPL (Grepalife) Building 221 Senator Gil Puyat Avenue Makati City, Philippines Telephone: 632 318 8567 www.rcbc.com
Hong Kong:	Tricor Investor Services Limited Level 22, Hopewell Centre 183 Queen's Road East Hong Kong Telephone: 852 2980-1333 www.tricorglobal.com

INTERESTS OF EXPERTS

Ernst & Young LLP, Chartered Professional Accountants, Licensed Public Accountants, Toronto, Canada, is the external auditor who prepared the Report of Independent Registered Public Accounting Firm to the Shareholders and Board of Directors on the audited consolidated financial statements of the Company, and the Report of Independent Registered Public Accounting Firm to the Shareholders and Board of Directors on Internal Control over Financial Reporting under Standards of the Public Company Accounting Oversight Board (United States). Ernst & Young LLP is independent with respect to the Company within the meaning of the CPA Code of Professional Conduct of the Chartered Professional Accountants of Ontario, United States federal securities laws and the rules and regulations thereunder, including the independence rules adopted by the SEC pursuant to the Sarbanes-Oxley Act of 2002 ("SOX") and is in compliance with Rule 3520 of the Public Company Accounting Oversight Board (United States).

AUDIT COMMITTEE

Audit Committee Charter

The Audit Committee has adopted a formal Charter that describes the Audit Committee's role and responsibilities. The Charter is set out in the attached Schedule 1.

The Audit Committee is responsible for assisting the Board in its oversight role with respect to the quality and integrity of financial information, the effectiveness of the Company's internal control over financial reporting, the effectiveness of the Company's risk management and compliance practices, the performance, qualifications and independence of the independent auditor, the Company's compliance with legal and regulatory requirements, the performance of the Company's finance, actuarial, internal audit and global compliance functions, and the procedures relating to conflicts of interest, confidential information, related party transactions, and customer complaints.

Composition of the Audit Committee

MFC's Audit Committee was composed of the following members as at December 31, 2018: Sheila Fraser (Chair of the Audit Committee), Rona Ambrose, Joseph Caron, Luther Helms, John Palmer and Andrea Rosen. The Board has reviewed the committee membership and determined that all members are financially literate as required by the NYSE Listed Company Manual and the applicable instruments of the Canadian Securities Administrators. All committee members are independent, pursuant to applicable regulatory and stock exchange requirements. The Board has also determined that Sheila Fraser, Luther Helms, John Palmer and Andrea Rosen have the necessary qualifications to be designated as audit committee financial experts under SOX.

Relevant Education and Experience

In addition to the general business experience of each member of the Audit Committee, the relevant education and experience of each member of MFC's Audit Committee in 2018 is as follows: Sheila Fraser holds a B. Comm from McGill University and is a Chartered Professional Accountant. Ms. Fraser is a former partner at Ernst & Young LLP and former Auditor General of Canada. Rona Ambrose holds a BA from the University of Victoria and an MA from the University of Alberta. Ms. Ambrose is the former Vice-Chair of the Treasury Board. Joseph Caron holds a BA from the University of Ottawa and is the Principal & Founder of Joseph Caron Incorporated. Luther Helms holds a BA from the University of Arizona and an MBA from the University of Santa Clara. Mr. Helms is the Founder and Advisor of Sonata Capital Group and previously served as Vice Chairman of KeyBank West and as Vice Chairman of Bank of America Corporation. John Palmer holds a BA from the University of British Columbia, is a Chartered Professional Accountant and is the former Deputy Chairman and Managing Partner of KPMG LLP (Canada) and the former Superintendent of OSFI. Andrea Rosen holds a BA from Yale University, an LLB from Osgoode Hall Law School and an MBA from the Schulich School of Business at York University. Ms. Rosen previously served as Vice Chair of TD Bank Financial Group and as President of TD Canada Trust.

Pre-Approval Policies and Procedures

Our auditor independence policy requires the Audit Committee to pre-approve all audit and permitted non-audit services (including the fees and conditions) the external auditor provides. If a new service is proposed during the year that is outside the pre-approved categories or budget, it must be pre-approved by the Audit Committee, or by a member that the committee has appointed to act on its behalf.

All audit and permitted non-audit services provided by Ernst & Young LLP have been pre-approved by the Audit Committee.

External Auditor Service Fees

The table below lists the services Ernst & Young LLP provided to Manulife and its subsidiaries in the last two fiscal years and the fees they charged each year.

Fees	2018 ($ in millions)	2017 ($ in millions)
Audit Fees: Includes the audit of our financial statements as well as the financial statements of our subsidiaries, segregated funds, audits of statutory filings, prospectus services, report on internal controls, reviews of quarterly reports and regulatory filings.	29.0	28.9
Audit-Related Fees: Includes consultation concerning financial accounting and reporting standards not classified as audit, due diligence in connection with proposed or consummated transactions and assurance services to report on internal controls for third parties.	2.7	2.7
Tax Fees: Includes tax compliance, tax planning and tax advice services.	0.4	0.4
All Other Fees: Includes other advisory services.	0.1	0.3
Total	32.2	32.3

ADDITIONAL INFORMATION

Additional information with respect to the Company, including directors' and officers' remuneration and indebtedness, and securities authorized for issuance under MFC's equity compensation plans, where applicable, is contained in MFC's Management Information Circular for its most recent annual meeting of security holders that involved the election of directors. Additional financial information is provided in our 2018 Consolidated Financial Statements and our 2018 MD&A. Copies of these documents and additional information relating to the Company may be found on SEDAR and is accessible at the Company's website, www.manulife.com.

Schedule 1

Manulife Financial Corporation (the "Company")

Audit Committee Charter

1. Overall Role and Responsibility

1.1 The Audit Committee ("Committee") shall:

(a) assist the Board of Directors in its oversight role with respect to:

(i) the quality and integrity of financial information;

(ii) the effectiveness of the Company's internal control over financial reporting;

(iii) the effectiveness of the Company's risk management and compliance practices;

(iv) the independent auditor's performance, qualifications and independence;

(v) the Company's compliance with legal and regulatory requirements;

(vi) the Finance, Actuarial, Internal Audit and Global Compliance functions;

(vii) conflicts of interest and confidential information;

(viii) related party transactions; and

(ix) complaints of customers relating to obligations under the *Insurance Companies Act* (Canada) (the "Act"), and accounting, internal accounting controls and audit matters.

(b) prepare such reports of the Committee required to be included in the Proxy Circular in accordance with applicable laws or the rules of applicable securities regulatory authorities.

1.2 The Committee will also act as the conduct review committee of the Company.

2. Structure and Composition

2.1 The Committee shall consist of five or more Directors appointed by the Board of Directors on the recommendation of the Corporate Governance and Nominating Committee.

2.2 No member of the Committee shall be an officer or employee of the Company, its subsidiaries or affiliates. Members of the Committee will not be affiliated with the Company as such term is defined in the Act.

2.3 Each member of the Committee shall satisfy the applicable independence and experience requirements of the laws governing the Company, the applicable stock exchanges on which the Company's securities are listed and applicable securities regulatory authorities.

2.4 The Board of Directors shall designate one member of the Committee as the Committee Chair.

2.5 Members of the Committee shall serve at the pleasure of the Board of Directors for such term or terms as the Board of Directors may determine.

2.6 Each member of the Committee shall be financially literate as such qualification is defined by applicable law and interpreted by the Board of Directors in its business judgment.

2.7 The Board of Directors shall determine whether and how many members of the Committee qualify as a financial expert as defined by applicable law. At least one member must be an audit committee financial expert, as defined in applicable laws and regulations.

2.8 The Committee shall annually determine whether any of its members serve on the audit committee of more than three public companies (including the Committee). If any of the Committee members fall into this category, the Committee shall consider the ability of such members to effectively serve on the Committee and, if it is determined that such members are able to continue serving, the Committee shall record the reasons for such a decision.

3. Structure, Operations and Assessment

3.1 The Committee shall meet quarterly or more frequently as the Committee may determine. The Committee shall report to the Board of Directors on its activities after each of its meetings.

3.2 The affirmative vote of a majority of the members of the Committee participating in any meeting of the Committee is necessary for the adoption of any resolution.

3.3 The Committee may create one or more subcommittees and may delegate, in its discretion, all or a portion of its duties and responsibilities to such subcommittees.

3.4 The Committee shall, on an annual basis:

(a) review and assess the adequacy of this Charter and, where necessary, recommend changes to the Board of Directors for its approval;

(b) undertake a performance evaluation of the Committee comparing the performance of the Committee with the requirements of this Charter; and

(c) report the results of the performance evaluation to the Board of Directors.

The performance evaluation by the Committee shall be conducted in such manner as the Committee deems appropriate. The report to the Board of Directors may take the form of an oral report by the chair of the Committee or any other member of the Committee designated by the Committee to make this report.

3.5 The Committee is expected to establish and maintain free and open communication with management, the independent auditor, the internal auditor and the Appointed Actuary and shall periodically meet separately with each of them.

4. Specific Duties

The Committee will carry out the following specific duties:

4.1 Oversight of the Independent Auditor

(a) Recommend to the Board for approval the appointment and, when considered appropriate, the dismissal or removal of the independent auditor for the purpose of preparing or issuing an auditor's report or performing other audit, review or attest services for the Company (subject to shareholder ratification).

(b) Review and approve the scope and terms of all audit engagements and recommend to the Board the compensation of the independent auditor.

(c) Oversee the work of the independent auditor engaged for the purpose of preparing or issuing an audit

report or performing other audit, review or attest services (including resolution of disagreements between management and the independent auditor regarding financial reporting). The independent auditor shall report directly to the Committee.

(d) Pre-approve all audit services and permitted non-audit services (including the fees, terms and conditions for the performance of such services) to be provided by the independent auditor.

(e) When appropriate, the Committee may delegate to one or more members the authority to grant preapprovals of audit and permitted non-audit services and the full Committee shall be informed of each non-audit service.

(f) Review the decisions of such delegates under subsection (e) above, which shall be presented to the full Committee at its next scheduled meeting.

(g) Evaluate the qualifications, performance and independence of the independent auditor, including:

(i) reviewing and evaluating the lead partner on the independent auditor's engagement with the Company;

(ii) considering whether the auditor's quality controls are adequate and the provision of permitted non-audit services are compatible with maintaining the auditor's independence; and

(iii) addressing any concerns raised by regulatory authorities or other stakeholders regarding the auditor's independence.

(h) Present its conclusions with respect to the independent auditor to the Board of Directors and, if so determined by the Committee, recommend that the Board of Directors take additional action to satisfy itself of the qualifications, performance and independence of the independent auditor.

(i) Obtain and review a report from the independent auditor at least annually regarding:

(i) the independent auditor's internal quality-control procedures;

(ii) any material issues raised by the most recent internal quality-control review, or peer review, of the firm, or by any inquiry or investigation by governmental or professional authorities within the preceding five years respecting one or more independent audits carried out by the firm;

(iii) any steps taken to deal with any such issues; and

(iv) all relationships between the independent auditor and the Company.

(j) At least annually, review and approve the audit plan (including any significant changes to the audit plan) and, as part of this review, satisfy itself that the audit plan is risk-based and addresses all the relevant activities over a measurable cycle and that the work of the independent auditor and Internal Audit is coordinated.

(k) Ensure the rotation of the lead (or coordinating) audit partner having primary responsibility for the audit and the audit partner responsible for reviewing the audit as required by law.

(l) Review and approve policies for the Company's hiring of partners and employees or former partners and employees of the independent auditor.

4.2 Financial Reporting

(a) Review and discuss with management and the independent auditor the annual audited financial statements, the results of the audit, any changes to the audit scope or strategy, the annual report of the auditors on the statements and any other returns or transactions required to be reviewed by the Committee and report to the Board of Directors prior to approval by the Board of Directors and the publication of earnings.

(b) Review such returns of the Company as the Superintendent of Financial Institutions (Canada) (the "Superintendent") may specify.

(c) Review and discuss with the independent auditor and with management the Company's annual and quarterly financial disclosures, including management's discussion and analysis. The Committee shall approve any reports for inclusion in the Company's Annual Report, as required by applicable legislation and make a recommendation thereon to the Board.

(d) Review the Company's disclosure policy, which governs the release of information about the Company and requires timely, accurate and fair disclosure of such information in compliance with all legal and regulatory requirements, and periodically assess the adequacy of procedures regarding disclosure of financial information.

(e) Require management to implement and maintain appropriate internal control procedures.

(f) Oversee systems of internal control and meet with the heads of the oversight functions, management and the independent auditors to assess the adequacy and effectiveness of these systems and to obtain reasonable assurance that the controls are effective.

(g) Review and discuss with management and the independent auditor management's report on its assessment of internal controls over financial reporting and the independent auditor's attestation report on management's assessment.

(h) Review, evaluate and approve the procedures established under s. 4.2(e).

(i) Review such investments and transactions that could adversely affect the well-being of the Company as the auditor or any officer of the Company may bring to the attention of the Committee.

(j) Review and discuss with management and the independent auditor the Company's quarterly financial statements prior to the publication of earnings, including:

  (i) the results of the independent auditor's review of the quarterly financial statements; and

  (ii) any matters required to be communicated by the independent auditor under applicable review standards.

(k) Review and discuss with management and the independent auditor at least annually significant financial reporting issues and judgments made in connection with the preparation of the Company's financial statements, including:

  (i) key areas of risk for material misstatement of the financial statements, including critical accounting estimates or areas of measurement uncertainty;

  (ii) whether the auditor considers estimates to be within an acceptable range and the rationale for the final valuation decision and whether it is consistent with industry practice;

(iii) any significant changes in the Company's selection or application of accounting or actuarial principles;

(iv) any major issues as to the adequacy of the Company's internal controls;

(v) any special steps adopted in light of material control deficiencies, if any; and

(vi) the role of any other audit firms.

(l) Review and discuss with management and the independent auditor at least annually reports from the independent auditor on:

(i) critical accounting policies and practices to be used;

(ii) significant financial reporting issues, estimates and judgments made in connection with the preparation of the financial statements;

(iii) alternative treatments of financial information within generally accepted accounting principles that have been discussed with management, ramifications of the use of such alternative disclosures and treatments, and the treatment preferred by the independent auditor; and

(iv) other material written communications between the independent auditor and management, such as any management letter or schedule of unadjusted differences.

(m) Meet with the independent auditor to discuss the annual financial statements and any investments or transactions that may adversely affect the well-being of the Company.

(n) Discuss with the independent auditor at least annually any "management" or "internal control" letters issued or proposed to be issued by the independent auditor to the Company and review all material correspondence between the independent auditor and management related to audit findings.

(o) Review and discuss with management and the independent auditor at least annually any significant changes to the Company's accounting and actuarial principles and practices suggested by the independent auditor, internal audit personnel or management and assess whether the Company's accounting and actuarial practices are appropriate and within the boundaries of acceptable practice.

(p) Discuss with management and approve the Company's earnings press releases, the release of earnings projections, forecast or guidance and the use of non-GAAP financial measures (if any), and the financial information provided to analysts and rating agencies.

(q) Review and discuss with management and the independent auditor at least annually the effect of regulatory and accounting initiatives as well as off-balance-sheet structures on the Company's financial statements.

(r) Discuss with the independent auditor matters required to be discussed by American Institute of Certified Public Accountants Statement on Auditing Standards No. 61 relating to the conduct of the audit, including any difficulties encountered in the course of the audit work, any restrictions on the scope of activities or access to requested information and any significant disagreements with management.

(s) Review and discuss with the Chief Executive Officer and the Chief Financial Officer the procedures undertaken in connection with the Chief Executive Officer and Chief Financial Officer certifications for the annual and interim filings with applicable securities regulatory authorities.

(t) Review disclosures made by the Company's Chief Executive Officer and Chief Financial Officer during

their certification process for the annual and interim filing with applicable securities regulatory authorities about any significant deficiencies in the design or operation of internal controls which could adversely affect the Company's ability to record, process, summarize and report financial data or any material weaknesses in the internal controls, and any fraud involving management or other employees who have a significant role in the Company's internal controls.

(u) Meet with the Appointed Actuary of the Company at least annually to receive and review reports, opinions and recommendations prepared by the Appointed Actuary in accordance with the Act, including the parts of the annual financial statement and the annual return filed under s. 665 of the Act, prepared by the actuary, and such other matters as the Committee may direct, including the report on Dynamic Capital Adequacy Testing, which is also reviewed by the Risk Committee.

(v) Receive reports from the Chief Actuary regarding material capital model modifications and new capital model applications.

(w) Discuss with the Company's General Counsel at least annually any legal matters that may have a material impact on the financial statements, operations, assets or compliance policies and any material reports or inquiries received by the Company or any of its subsidiaries from regulators or governmental agencies.

(x) Meet with the Chief Internal Auditor and with management to discuss the effectiveness of the internal control procedure established pursuant to s. 4.2(e).

4.3 Oversight of the Finance Function

(a) At least annually review and approve the mandate of the Chief Financial Officer and the Finance function.

(b) At least annually, review and approve the budget, structure, skills and resources of the Finance function.

(c) At least annually, review the performance evaluation of the Chief Financial Officer, with the input of the Management Resources and Compensation Committee, and assess the effectiveness of the Chief Financial Officer and the Finance function.

(d) Recommend to the Board for approval the appointment and, when considered appropriate, the dismissal of the Chief Financial Officer, who shall have direct access to the Committee.

(e) Review the results of periodic independent reviews of the Finance function.

4.4 Oversight of the Actuarial Function

(a) At least annually, review and approve the mandate for the Chief Actuary and the Actuarial function.

(b) At least annually, review and approve the budget, structure, skills and resources of the Actuarial function.

(c) At least annually, review the performance evaluation of the Chief Actuary, with the input of the Management Resources and Compensation Committee, and assess the effectiveness of the Chief Actuary and the Actuarial function.

(d) Recommend to the Board for approval the appointment and, when considered appropriate, the dismissal of the Chief Actuary, who shall have direct access to the Committee.

(e) Review the results of periodic independent reviews of the Actuarial function.

4.5 Oversight of the Internal Audit Function

(a) At least annually, review and approve the mandate of the Chief Auditor and the Internal Audit function.

(b) At least annually, review and approve the budget, structure, skills, resources, independence and qualifications of the Internal Audit function.

(c) At least annually, review and approve the audit plan of the Internal Audit function (including any significant changes to the audit plan) and, as part of this review, satisfy itself that the audit plan is risk-based and addresses all the relevant activities over a measurable cycle and that the work of the independent auditor and Internal Audit is coordinated.

(d) Review the periodic reports of the internal audit department on internal audit activities, including audit findings, recommendations and progress in meeting the annual audit plan (including the impact of any resource limitations).

(e) At least annually, review the performance evaluation and compensation of the Chief Auditor, with the input of the Management Resources and Compensation Committee, and assess the effectiveness of the Chief Auditor and the Internal Audit function.

(f) Recommend to the Board for approval the appointment and, when considered appropriate, the dismissal of the Chief Auditor, who shall have direct access to the Committee.

(g) Review the results of periodic independent reviews and self-assessments of the Internal Audit function's conformance with the International Standards for the Professional Practice of Internal Auditing and Code of Ethics, and action plans to address any significant conformance issues.

4.6 Risk Management Oversight

(a) Review reports from the Risk Committee respecting the Company's processes for assessing and managing risk.

(b) The Committee will receive reports from the General Counsel as Chair of the Disclosure Committee.

4.7 Oversight of Regulatory Compliance and Complaint Handling

(a) Establish procedures for the receipt, retention and treatment of complaints received by the Company regarding accounting, internal accounting controls or auditing matters, and the confidential, anonymous submission by employees of concerns regarding questionable accounting or auditing matters.

(b) Discuss with management and the independent auditor at least annually any correspondence with regulators or governmental agencies and any published reports which raise material issues regarding the Company's financial statements or accounting.

(c) Review at least annually with the Global Compliance Chief the Company's compliance with applicable laws and regulations, and correspondence from regulators.

4.8 Oversight of the Global Compliance Function

(a) At least annually, review and approve the mandate for the Global Compliance Chief and the Global Compliance function.

(b) At least annually, review and approve the budget, structure, skills and resources of the Global Compliance function.

(c) At least annually, review the performance evaluation of the Global Compliance Chief, with the input of the Management Resources and Compensation Committee, and assess the effectiveness of the Global Compliance Chief and the Global Compliance function.

(d) Recommend to the Board for approval, the appointment and, when considered appropriate, the dismissal of the Global Compliance Chief, who shall have direct access to the Committee.

(e) Review the results of periodic independent reviews of the Global Compliance function.

4.9 Oversight of the Anti-Money Laundering and Anti-Terrorist Financing Program

(a) The Committee shall review the Company's Anti-Money Laundering and Anti-Terrorist Financing Policy.

(b) The Committee shall meet with the Chief Anti-Money Laundering Officer as necessary to review the AML/ATF Program.

(c) The Committee shall meet with the Chief Auditor as necessary to review results of testing of the effectiveness of the AML/ATF Program.

4.10 Review of Ethical Standards

(a) Annual review of the Company's Code of Business Conduct and Ethics.

(b) Establish procedures to receive and process any request from executive officer(s) and Director(s) for waiver of the Company's Code of Business Conduct and Ethics.

(c) Grant any waiver of the Company's Code of Business Conduct and Ethics to executive officer(s) and Director(s) as the Committee may in its sole discretion deem appropriate and arrange for any such waiver to be promptly disclosed to the shareholders in accordance with applicable laws or the rules of applicable securities regulatory authorities.

(d) Annual review and assessment of procedures established by the Board of Directors to resolve conflicts of interest, including techniques for identification of potential conflict situations.

(e) Review and assessment of procedures established by the Board of Directors for restricting the use of confidential information.

4.11 Self Dealing and Disclosure Requirements

(a) Require management to establish procedures for complying with Part XI (Self-Dealing) of the Act (the "Related Party Procedures").

(b) Establish criteria for the determination of materiality of a transaction with a related party.

(c) Annual review of the Related Party Procedures and their effectiveness in ensuring that the Company is complying with Part XI of the Act and the Sarbanes-Oxley Act.

(d) Review the practices of the Company to ensure that any transactions with related parties of the Company that may have a material effect on the stability or solvency of the Company are identified.

(e) Ensure that, within 90 days after the end of each financial year of the Company, the Committee will report to the Superintendent on its activities of the previous year respecting conduct review,

undertaken in carrying out its responsibilities under the Act (and, in particular, in respect of (a), (c), and (d) above).

(f) The Committee shall report to the Superintendent on its mandate respecting conduct review and responsibilities of the Committee and the procedures referred to in (a) above.

(g) Review and assessment of the procedures established by the Board of Directors to disclose information to customers of the Company under the Act, if applicable, and of the procedures for dealing with complaints of customers of the Company to satisfy itself that the applicable procedures are being followed.

4.12 Proxy Circular

(a) The Committee shall prepare a report on its activities on an annual basis to be included in the Proxy Circular, as may be required by applicable laws or rules of applicable securities regulatory authorities.

4.13 Duties and Responsibilities Delegated by the Board

(a) Exercise such other powers and perform such other duties and responsibilities as are incidental to the purposes, duties and responsibilities specified herein and as may from time to time be delegated to the Committee by the Board of Directors.

5. Funding for the Independent Auditor and Retention of External Advisors

The Company shall provide for appropriate funding, as determined by the Committee, for payment of compensation to the independent auditor for the purpose of issuing an audit report and to any advisors retained by the Committee. The Committee shall have the authority to retain such external advisors as it may from time to time deem necessary or advisable for its purposes and to set the terms of the retainer. The expenses related to any such engagement shall also be funded by the Company.

Exhibit 99.4

Certification of Annual Filings

Manulife Financial Corporation

I, Roy Gori, certify that:

1. I have reviewed this annual report on Form 40-F of Manulife Financial Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the issuer as of, and for, the periods presented in this report;
4. The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the issuer and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the issuer's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the issuer's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the issuer's internal control over financial reporting; and
5. The issuer's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the issuer's auditors and the audit committee of the issuer's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the issuer's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the issuer's internal control over financial reporting.

Date: February 13, 2019

/s/ Roy Gori
Roy Gori
President and Chief Executive Officer

Exhibit 99.5

Certification of Annual Filings

Manulife Financial Corporation

I, Philip J. Witherington, certify that:

1. I have reviewed this annual report on Form 40-F of Manulife Financial Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the issuer as of, and for, the periods presented in this report;
4. The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the issuer and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the issuer's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the issuer's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the issuer's internal control over financial reporting; and
5. The issuer's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the issuer's auditors and the audit committee of the issuer's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the issuer's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the issuer's internal control over financial reporting.

Date: February 13, 2019

/s/ Philip J. Witherington
Philip J. Witherington
Chief Financial Officer

Exhibit 99.6

CERTIFICATION
Pursuant to 18 United States Code s. 1350
As adopted pursuant to
Section 906 of the Sarbanes–Oxley Act of 2002

In connection with the Annual Report on Form 40-F of Manulife Financial Corporation (the "Company") for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 13, 2019

/s/ Roy Gori
Name: Roy Gori
Title: President and Chief Executive Officer

Exhibit 99.7

CERTIFICATION
Pursuant to 18 United States Code s. 1350
As adopted pursuant to
Section 906 of the Sarbanes–Oxley Act of 2002

In connection with the Annual Report on Form 40-F of Manulife Financial Corporation (the "Company") for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned officer of the Company certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 13, 2019

/s/ Philip J. Witherington
Philip J. Witherington
Chief Financial Officer

Exhibit 99.8

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the reference to our firm under the caption “Experts” and to the use of our reports dated February 13, 2019, with respect to the consolidated financial statements of Manulife Financial Corporation (the “Company”), and the effectiveness of internal control over financial reporting of the Company, included in the 2018 Annual Report (Form 40-F) for the year ended December 31, 2018.

We also consent to the incorporation by reference and to the use of these reports dated February 13, 2019 in the following Registration Statements:

- Registration Statement (Form S-8 No. 333-12610) of Manulife Financial Corporation pertaining to the Manulife Financial Corporation Stock Plan for Non-Employee Directors and Executive Stock Option Plan;
- Registration Statement (Form S-8 No. 333-13072) of Manulife Financial Corporation pertaining to the Manulife Financial Corporation Global Share Ownership Plan;
- Registration Statement (Form S-8 No. 333-157326) of Manulife Financial Corporation pertaining to the Stock Plan for Non-Employee Directors, Executive Stock Option Plan and Global Share Ownership Plan;
- Registration Statement (Form S-8 No. 333-114951) of Manulife Financial Corporation pertaining to the John Hancock Financial Services, Inc. 1999 Long-Term Stock Incentive Plan, as amended and the John Hancock Financial Services, Inc. Non-Employee Directors’ Long-Term Stock Incentive Plan;
- Registration Statement (Form S-8 No. 333-129430) of Manulife Financial Corporation pertaining to the Deferred Compensation Plan for Certain Employees of John Hancock and the Deferred Compensation Plan of the John Hancock Financial Network;
- Registration Statement (Form S-8 No. 333-211366) of Manulife Financial Corporation pertaining to the Deferred Compensation Plan for Certain Employees of John Hancock and the Deferred Compensation Plan for the John Hancock Financial Network;
- Registration Statement (Form F-10 No. 333-221951) of Manulife Financial Corporation pertaining to Manulife Financial Corporation’s shelf prospectus offering Debt Securities, Preferred Shares, Common Shares, Subscription Receipts, Warrants, Share Purchase Contracts and Units;
- Registration Statement (Form F-3 Nos. 333-221821-01 and 333-221821) of Manulife Financial Corporation and John Hancock Life Insurance Company (U.S.A.) pertaining to deferred annuity contracts with market value adjustment interests and Manulife Financial Corporation’s subordinated guarantee relating thereto;
- Registration Statement (Form F-3 Nos. 333-208663-01 and 333-208663) of Manulife Financial Corporation and John Hancock Life Insurance Company (U.S.A.) pertaining to John Hancock Life Insurance Company (U.S.A.)’s market value adjustment interests under deferred annuity contracts and Manulife Financial Corporation’s subordinated guarantee relating thereto;
- Registration Statement (Form F-3 No. 333-159176) of Manulife Financial Corporation pertaining to the Manulife Financial Corporation Dividend Reinvestment and Share Purchase Plan for U.S. Shareholders.

/s/ “Ernst & Young LLP”

Toronto, Canada
February 13, 2019

Chartered Professional Accountants
Licensed Public Accountants

Exhibit 99.9

CONSENT OF APPOINTED ACTUARY

I hereby consent to the use and incorporation by reference in this Annual Report on Form 40-F of Manulife Financial Corporation (the "Company") for the year ended December 31, 2018 of my Appointed Actuary's Report to the Shareholders and Directors dated February 13, 2019 (the "Report"), relating to the valuation of the policy liabilities of the Company for its Consolidated Balance Sheets as at December 31, 2018 and 2017 and their change in the Consolidated Statements of Operations for the years then ended.

/s/ Steven A. Finch
Steven A. Finch
Chief Actuary
Fellow, Canadian Institute of Actuaries
Toronto, Canada

Date: February 13, 2019