Manulife

John Hancock

Manulife Financial Corporation

Consolidated Financial Statements

For the year ended December 31, 2016

Responsibility for Financial Reporting

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

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

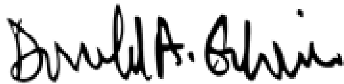
Appropriate systems of internal control, policies and procedures have been maintained to ensure that financial information is both relevant and reliable. The systems of internal control are assessed on an ongoing basis by management and the Company's internal audit department.

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

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

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

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



Donald A. Guloien
President and Chief Executive Officer

Steve B. Roder
Senior Executive Vice President and Chief Financial Officer

Toronto, Canada

February 9, 2017

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, 2016 and 2015 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.

Mr. Steven A. Finch
Executive Vice President and Appointed Actuary

Toronto, Canada

February 9, 2017

Independent Auditors' Report of Registered Public Accounting Firm

To the Shareholders of Manulife Financial Corporation

We have audited the accompanying consolidated financial statements of Manulife Financial Corporation, which comprise the Consolidated Statements of Financial Position as at December 31, 2016 and 2015, and the Consolidated Statements of Income, Comprehensive Income, Changes in Equity and Cash Flows for the years then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with International Financial Reporting Standards as issued by the International Accounting Standards Board, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Canadian generally accepted auditing standards and the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated financial statements, evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

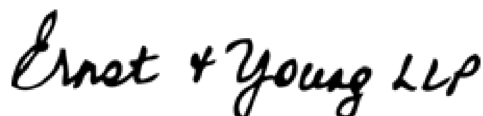
We believe that the audit evidence we have obtained in our audits is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of Manulife Financial Corporation as at December 31, 2016 and 2015, 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.

Other Matter

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Manulife Financial Corporation's internal control over financial reporting as of December 31, 2016, 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 9, 2017 expressed an unqualified opinion on Manulife Financial Corporation's internal control over financial reporting.



Chartered Professional Accountants
Licensed Public Accountants

Toronto, Canada

February 9, 2017

Independent Auditors' Report of Registered Public Accounting Firm on Internal Control Under Standards of The Public Company Accounting Oversight Board (United States)

To the Shareholders of Manulife Financial Corporation

We have audited Manulife Financial Corporation's internal control over financial reporting as of December 31, 2016, 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). Manulife Financial Corporation'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.

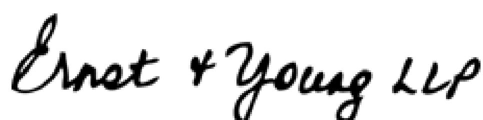
We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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.

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.

In our opinion, Manulife Financial Corporation maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on the COSO criteria.

We also have audited, in accordance with Canadian generally accepted auditing standards and the standards of the Public Company Accounting Oversight Board (United States), the Consolidated Statements of Financial Position as at December 31, 2016 and 2015, and the Consolidated Statements of Income, Comprehensive Income, Changes in Equity and Cash Flows for the years then ended of Manulife Financial Corporation, and our report dated February 9, 2017, expressed an unqualified opinion thereon.



Chartered Professional Accountants
Licensed Public Accountants

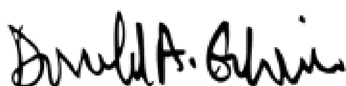
Toronto, Canada

February 9, 2017

Consolidated Statements of Financial Position

As at December 31, (Canadian $ in millions)	2016	2015
Assets		
Cash and short-term securities	**$ 15,151**	$ 17,885
Debt securities	**168,622**	157,827
Public equities	**19,496**	16,983
Mortgages	**44,193**	43,818
Private placements	**29,729**	27,578
Policy loans	**6,041**	5,912
Loans to bank clients	**1,745**	1,778
Real estate	**14,132**	15,347
Other invested assets	**22,760**	20,378
Total invested assets (note 4)	**321,869**	307,506
Other assets		
Accrued investment income	**2,260**	2,264
Outstanding premiums	**845**	878
Derivatives (note 5)	**23,672**	24,272
Reinsurance assets (note 8)	**34,952**	35,426
Deferred tax assets (note 6)	**4,439**	4,067
Goodwill and intangible assets (note 7)	**10,107**	9,384
Miscellaneous	**7,360**	5,825
Total other assets	**83,635**	82,116
Segregated funds net assets (note 22)	**315,177**	313,249
Total assets	**$ 720,681**	$ 702,871
Liabilities and Equity		
Liabilities		
Insurance contract liabilities (note 8)	**$ 297,505**	$ 285,288
Investment contract liabilities (note 9)	**3,275**	3,497
Deposits from bank clients	**17,919**	18,114
Derivatives (note 5)	**14,151**	15,050
Deferred tax liabilities (note 6)	**1,359**	1,235
Other liabilities	**15,596**	14,952
	349,805	338,136
Long-term debt (note 11)	**5,696**	1,853
Capital instruments (note 12)	**7,180**	7,695
Segregated funds net liabilities (note 22)	**315,177**	313,249
Total liabilities	**677,858**	660,933
Equity		
Preferred shares (note 13)	**3,577**	2,693
Common shares (note 13)	**22,865**	22,799
Contributed surplus	**284**	277
Shareholders' retained earnings	**9,759**	8,398
Shareholders' accumulated other comprehensive income (loss):		
Pension and other post-employment plans	**(417)**	(521)
Available-for-sale securities	**(394)**	345
Cash flow hedges	**(232)**	(264)
Translation of foreign operations and real estate revaluation surplus	**6,390**	7,432
Total shareholders' equity	**41,832**	41,159
Participating policyholders' equity	**248**	187
Non-controlling interests	**743**	592
Total equity	**42,823**	41,938
Total liabilities and equity	**$ 720,681**	$ 702,871

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



Donald A. Guloien
President and Chief Executive Officer

Richard B. DeWolfe
Chairman of the Board of Directors

Consolidated Statements of Income

For the years ended December 31, (Canadian $ in millions except per share amounts)	2016	2015
Revenue		
Premium income		
Gross premiums	**$ 36,659**	$ 32,020
Premiums ceded to reinsurers	**(9,027)**	(8,095)
Premiums ceded, net of commission and additional consideration relating to Closed Block reinsurance transaction (note 3)	**–**	(7,996)
Net premiums	**27,632**	15,929
Investment income (note 4)		
Investment income	**13,390**	11,465
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on the macro hedge program	**1,134**	(3,062)
Net investment income	**14,524**	8,403
Other revenue	**11,181**	10,098
Total revenue	**53,337**	34,430
Contract benefits and expenses		
To contract holders and beneficiaries		
Gross claims and benefits (note 8)	**25,059**	23,761
Change in insurance contract liabilities	**18,014**	7,452
Change in investment contract liabilities	**–**	203
Benefits and expenses ceded to reinsurers	**(8,097)**	(7,265)
Change in reinsurance assets (note 8)	**(842)**	(6,810)
Net benefits and claims	**34,134**	17,341
General expenses	**6,995**	6,221
Investment expenses (note 4)	**1,646**	1,615
Commissions	**5,818**	5,176
Interest expense	**1,013**	1,101
Net premium taxes	**402**	358
Total contract benefits and expenses	**50,008**	31,812
Income before income taxes	**3,329**	2,618
Income tax expense (note 6)	**(196)**	(328)
Net income	**$ 3,133**	$ 2,290
Net income attributed to:		
Non-controlling interests	**$ 143**	$ 69
Participating policyholders	**61**	30
Shareholders	**2,929**	2,191
	$ 3,133	$ 2,290
Net income attributed to shareholders	**2,929**	2,191
Preferred share dividends	**(133)**	(116)
Common shareholders' net income	**$ 2,796**	$ 2,075
Earnings per share		
Basic earnings per common share (note 13)	**$ 1.42**	$ 1.06
Diluted earnings per common share (note 13)	**1.41**	1.05
Dividends per common share	**0.740**	0.665

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)	2016	2015
Net income	**$ 3,133**	$ 2,290
Other comprehensive income ("OCI"), net of tax:		
Items that may be subsequently reclassified to net income:		
Foreign exchange gains (losses) on:		
Translation of foreign operations	**(1,044)**	5,450
Net investment hedges	**2**	(131)
Available-for-sale financial securities:		
Unrealized losses arising during the year	**(218)**	(165)
Reclassification of net realized gains and impairments to net income	**(523)**	(283)
Cash flow hedges:		
Unrealized gains (losses) arising during the year	**21**	(64)
Reclassification of realized losses to net income	**11**	11
Share of other comprehensive loss of associates	**–**	(3)
Total items that may be subsequently reclassified to net income	**(1,751)**	4,815
Items that will not be reclassified to net income:		
Change in pension and other post-employment plans	**104**	8
Real estate revaluation reserve	**–**	2
Total items that will not be reclassified to net income	**104**	10
Other comprehensive income (loss), net of tax	**(1,647)**	4,825
Total comprehensive income, net of tax	**$ 1,486**	$ 7,115
Total comprehensive income attributed to:		
Non-controlling interests	**$ 141**	$ 67
Participating policyholders	**61**	31
Shareholders	**1,284**	7,017

Income Taxes included in Other Comprehensive Income

For the years ended December 31, (Canadian $ in millions)	2016	2015
Income tax expense (recovery) on:		
Unrealized foreign exchange gains/losses on translation of foreign operations	**$ 1**	$ 5
Unrealized foreign exchange gains/losses on net investment hedges	**22**	(48)
Unrealized gains/losses on available-for-sale financial securities	**(15)**	(120)
Reclassification of realized gains/losses and recoveries/impairments to net income on available-for-sale financial securities	**(183)**	(36)
Unrealized gains/losses on cash flow hedges	**15**	(39)
Reclassification of realized gains/losses to net income on cash flow hedges	**6**	6
Share of other comprehensive loss of associates	**–**	(1)
Change in pension and other post-employment plans	**57**	(11)
Real estate revaluation reserve	**–**	1
Total income tax recovery	**$ (97)**	$ (243)

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)	2016	2015
Preferred shares		
Balance, beginning of year	**$ 2,693**	$ 2,693
Issued (note 13)	**900**	–
Issuance costs, net of tax	**(16)**	–
Balance, end of year	**3,577**	2,693
Common shares		
Balance, beginning of year	**22,799**	20,556
Issued on exercise of stock options	**66**	37
Issued in exchange of subscription receipts	**–**	2,206
Balance, end of year	**22,865**	22,799
Contributed surplus		
Balance, beginning of year	**277**	267
Exercise of stock options and deferred share units	**(12)**	(6)
Stock option expense	**19**	16
Balance, end of year	**284**	277
Shareholders' retained earnings		
Balance, beginning of year	**8,398**	7,624
Net income attributed to shareholders	**2,929**	2,191
Preferred share dividends	**(133)**	(116)
Common share dividends	**(1,435)**	(1,301)
Balance, end of year	**9,759**	8,398
Shareholders' accumulated other comprehensive income (loss) ("AOCI")		
Balance, beginning of year	**6,992**	2,166
Change in unrealized foreign exchange gains (losses) of net foreign operations	**(1,042)**	5,319
Change in actuarial gains (losses) on pension and other post-employment plans	**104**	8
Change in unrealized gains (losses) on available-for-sale financial securities	**(739)**	(446)
Change in unrealized gains (losses) on derivative instruments designated as cash flow hedges	**32**	(53)
Change in real estate revaluation reserve	**–**	1
Share of other comprehensive loss of associates	**–**	(3)
Balance, end of year	**5,347**	6,992
Total shareholders' equity, end of year	**41,832**	41,159
Participating policyholders' equity		
Balance, beginning of year	**187**	156
Net income attributed to participating policyholders	**61**	30
Other comprehensive income attributed to policyholders	**–**	1
Balance, end of year	**248**	187
Non-controlling interests		
Balance, beginning of year	**592**	464
Net income attributed to non-controlling interests	**143**	69
Other comprehensive loss attributed to non-controlling interests	**(2)**	(2)
Contributions, net	**10**	61
Balance, end of year	**743**	592
Total equity, end of year	**$ 42,823**	$ 41,938

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)	2016	2015
Operating activities		
Net income	**$ 3,133**	$ 2,290
Adjustments:		
Increase in insurance contract liabilities	**18,014**	7,452
Increase in investment contract liabilities	**–**	203
(Increase) decrease in reinsurance assets, excluding the impact of Closed Block reinsurance transaction	**(842)**	1,391
Amortization of (premium) discount on invested assets	**78**	90
Other amortization	**693**	580
Net realized and unrealized (gains) losses and impairments on assets	**(2,804)**	3,487
Deferred income tax recovery	**(235)**	(343)
Stock option expense	**19**	16
Cash provided by operating activities before undernoted items	**18,056**	15,166
Cash decrease due to Closed Block reinsurance transaction (note 3)	**–**	(2,023)
Changes in policy related and operating receivables and payables	**(1,020)**	(2,769)
Cash provided by operating activities	**17,036**	10,374
Investing activities		
Purchases and mortgage advances	**(104,059)**	(77,141)
Disposals and repayments	**82,001**	66,942
Change in investment broker net receivables and payables	**(186)**	102
Net cash decrease from sale and purchase of subsidiaries and businesses	**(495)**	(3,808)
Cash used in investing activities	**(22,739)**	(13,905)
Financing activities		
Decrease in repurchase agreements and securities sold but not yet purchased	**(23)**	(212)
Issue of long-term debt, net (note 11)	**3,899**	–
Redemption of long-term debt (note 11)	**(158)**	(2,243)
Issue of capital instruments, net (note 12)	**479**	2,089
Redemption of capital instruments (note 12)	**(949)**	(350)
Funds repaid, net	**(19)**	(46)
Secured borrowing from securitization transactions	**847**	436
Changes in deposits from bank clients, net	**(157)**	(351)
Shareholders' dividends paid in cash	**(1,593)**	(1,427)
Contributions from non-controlling interests, net	**10**	61
Common shares issued, net (note 13)	**66**	37
Preferred shares issued, net (note 13)	**884**	–
Cash provided by (used in) financing activities	**3,286**	(2,006)
Cash and short-term securities		
Decrease during the year	**(2,417)**	(5,537)
Effect of foreign exchange rate changes on cash and short-term securities	**(347)**	2,102
Balance, beginning of year	**17,002**	20,437
Balance, December 31	**14,238**	17,002
Cash and short-term securities		
Beginning of year		
Gross cash and short-term securities	**17,885**	21,079
Net payments in transit, included in other liabilities	**(883)**	(642)
Net cash and short-term securities, January 1	**17,002**	20,437
End of year		
Gross cash and short-term securities	**15,151**	17,885
Net payments in transit, included in other liabilities	**(913)**	(883)
Net cash and short-term securities, December 31	**$ 14,238**	$ 17,002
Supplemental disclosures on cash flow information		
Interest received	**$ 10,550**	$ 9,925
Interest paid	**983**	1,071
Income taxes paid	**841**	787

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

Notes to Consolidated Financial Statements

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Notes to Consolidated Financial Statements

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

Note 1 Nature of Operations and Significant Accounting Policies

(a) Reporting entity

Manulife Financial Corporation ("MFC") is a publicly traded company and the holding company of The Manufacturers Life Insurance Company ("MLI"), a Canadian life insurance company, and John Hancock Reassurance Company Ltd. ("JHRECO"), a Bermudian reinsurance 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 2016 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, 2016 were authorized for issue by MFC's Board of Directors on February 9, 2017.

(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 the assumptions used in measuring insurance and investment contract liabilities, assessing assets for impairment, determination 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 has the ability to 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. Embedded and complex derivative financial instruments as well as real estate classified as investment property 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 minority 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 and controlled structured entities are included in the Company'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 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 other comprehensive income, 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 non-controlling interests in the subsidiary's capital are presented as liabilities of the Company and 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"), whereby the Company records its share of the associate'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 over the entity. Gains and losses on the sale of associates are included in income when realized, while impairment losses are recognized immediately when there is objective evidence of impairment. Gains and losses on transactions with associates are eliminated to the extent of the Company's interest in the associate. Investments in associates 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". 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 described in note 4. 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 cash, current operating accounts, overnight bank and term deposits, and fixed income securities held for the purpose of 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. The carrying value of these instruments approximates fair value due to their short-term maturities and they are generally classified as Level 1. 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 the significant inputs are 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, with the exception of unrealized gains and losses on foreign currency translation which are included in income. Impairment losses on AFS debt securities are recognized in income 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 classified as Level 1, as fair values are 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 significant amounts or for prolonged periods 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 due to the lack of 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 mortgages. Expected future cash flows are typically determined in reference to the fair value of collateral security underlying the mortgages, net of expected costs of realization and any applicable insurance recoveries. Significant judgment is applied in the determination of impairment including the timing and account 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 amount owed at maturity. Interest income from these mortgages and interest expense on the borrowing 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. 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 rates inherent in the loans. 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 balance. 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 unpaid principal less allowance for credit losses, if any. Loans to Bank clients are considered impaired when there is objective evidence of impairment as a result of one or more loss events that have occurred after initial recognition, with a negative impact on the estimated future cash flows of a 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 subsequent to 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 the investment return assumptions include expected future credit losses on fixed income investments. Refer to note 8 (d).

Interest income is recognized on debt securities, mortgages, private placements, policy loans and loans to Bank clients as it accrues and is calculated by 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 own use property is used in the valuation of insurance contract liabilities.

Investment property is property held to earn rental income, for capital appreciation, or both. Investment property is 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 property is classified as Level 3.

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 costs are measured on a "successful efforts" basis. Timber and agriculture properties are measured at fair value with changes in fair value recognized in income with the exception of bearer plants which are measured at amortized cost (refer to note 2(II)). The fair value of other invested assets is determined using a variety of valuation techniques as described in note 4. Other invested assets that are measured 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 and liabilities and contingent liabilities assumed. 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 the purpose of impairment testing based on the lowest level within the entity in which the goodwill is monitored for internal management purposes. The allocation is made to those CGUs or groups of CGUs that are expected to benefit from the business combination in which the goodwill arose. Any potential impairment of goodwill is identified by comparing the recoverable amount of a CGU or group of CGUs to its carrying value. Goodwill is reduced by the amount of deficiency, if any. If the deficiency exceeds the carrying amount of goodwill, the carrying values of the remaining assets in the CGU or group of CGUs are subject to being reduced by the excess on a pro-rata basis.

The recoverable amount of a CGU is the higher of the estimated fair value less costs to sell or the value-in-use of the CGU. In assessing value-in-use, the 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 the 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, five 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, or more frequently when events or changes in circumstances dictate. If any indication of impairment exists, these assets are subject to an impairment test.

(g) Miscellaneous assets

Miscellaneous assets include assets in a rabbi trust with respect to unfunded defined benefit obligations, deferred acquisition costs, capital assets and defined benefit assets, if any (refer to note 1(o)). 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 a number of 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, real estate, short-term investments and cash and cash equivalents. 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 net liabilities are measured based on the value of the segregated funds net assets. Investment returns on segregated fund 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. Refer to note 22.

Liabilities related to guarantees associated with certain 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 IAS 18 "Revenue", 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 Canadian Asset Liability Method ("CALM") as permitted by IFRS 4 "Insurance Contracts". Refer to note 8.

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 only reduces accounting mismatches between the assets supporting the contracts and the liabilities. The liability is 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, taking into account 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 8(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 as a result of operations in 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 and associates, 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 as a result of examinations by the 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 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 with the exception of 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, special 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. The change in the value of the awards resulting from changes in the market value of the Company'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 and restricted 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 over the period from the grant date to the date of retirement eligibility.

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

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

The cost of retiree welfare plans is recognized in income over the employees' years of service to their dates of full entitlement.

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.

(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 ("host 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 4.

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 and 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 the fair value of the hedging derivatives are recorded in investment income, along with changes in fair value attributable to the hedged risk. The carrying value of the hedged item is adjusted for changes in fair value attributable to the hedged risk. To the extent the changes in the fair value of derivatives do not offset the changes in the fair value of the hedged item attributable to the hedged risk in investment income, any ineffectiveness will remain in investment income. 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 changes in the fair value of the hedging instrument is recorded in OCI while the ineffective portion is recognized in investment income. Gains and losses accumulated in OCI are recognized in income during the same periods as the variability in the cash flows hedged or the hedged forecasted transactions are recognized in income. The reclassifications from accumulated other comprehensive income ("AOCI") are made to investment income, with the exception of total return swaps that hedge restricted share units, which are reclassified to general expenses.

Gains and losses on cash flow hedges accumulated in OCI 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 accumulated in OCI 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 hedging relationship, the 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 8). Revenue on service contracts is recognized as services are rendered.

Expenses are recognized when incurred. Insurance contract liabilities are computed at the end of each year, resulting in benefits and expenses being matched with the premium income.

Note 2 Accounting and Reporting Changes

(a) Changes in accounting policy

(I) Amendments to IAS 16 "Property, Plant and Equipment" and IAS 38 "Intangible Assets"

Effective January 1, 2016, the Company adopted the amendments issued in May 2014 to IAS 16 "Property, Plant and Equipment" and IAS 38 "Intangible Assets". These amendments were applied prospectively. The amendments clarified that depreciation or amortization of assets accounted for under these two standards should reflect a pattern of consumption of the assets rather than reflect economic benefits expected to be generated from the assets. Adoption of these amendments did not have a significant impact on the Company's Consolidated Financial Statements.

(II) Amendments to IAS 41 "Agriculture" and IAS 16 "Property, Plant and Equipment"

Effective January 1, 2016, the Company adopted the amendments issued in June 2014 to IAS 41 "Agriculture" and IAS 16 "Property, Plant and Equipment". These amendments were applied retrospectively. These amendments require that "bearer plants" (that is, plants used in the production of agricultural produce and not intended to be sold as a living plant except for incidental scrap sales) should be considered as property, plant and equipment in the scope of IAS 16 and should be measured either at amortized cost or revalued amount with changes recognized in OCI. Previously these plants were in the scope of IAS 41 and were measured at fair value less cost to sell. These amendments only apply to the accounting requirements of a bearer plant and not agricultural land properties. The Company chose to carry bearer plants at amortized cost. Adoption of these amendments did not have a significant impact on the Company's Consolidated Financial Statements.

(III) Amendments to IFRS 10 "Consolidated Financial Statements", IFRS 12 "Disclosure of Interests in Other Entities", and IAS 28 "Investments in Associates and Joint Ventures"

Effective January 1, 2016, the Company adopted the amendments issued in December 2014 to IFRS 10 "Consolidated Financial Statements", IFRS 12 "Disclosure of Interests in Other Entities", and IAS 28 "Investments in Associates and Joint Ventures". These amendments were applied retrospectively. The amendments clarify the requirements when applying the investment entities consolidation exception. Adoption of these amendments did not have a significant impact on the Company's Consolidated Financial Statements.

(b) Future accounting and reporting changes

(I) Annual Improvements 2014–2016 Cycle

Annual Improvements 2014-2016 Cycle were issued in December 2016 resulting in minor amendments to three standards and are effective for the Company starting January 1, 2017. While the Company is assessing the impact of these amendments, adoption of these amendments is not expected to have a significant impact on the Company's Consolidated Financial Statements.

(II) IFRS 16 "Leases"

IFRS 16 "Leases" was issued in January 2016 and is effective for years beginning on or after January 1, 2019, to be applied retrospectively or on a modified retrospective basis. It will replace IAS 17 "Leases" and IFRIC 4 "Determining whether an arrangement contains a lease". 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. The Company is assessing the impact of this standard.

(III) Amendments to IAS 7 "Statement of Cash Flows"

Amendments to IAS 7 "Statement of Cash Flows" were issued in January 2016 and are effective for annual periods beginning on or after January 1, 2017, to be applied prospectively. These amendments require companies to provide information about changes in their financing liabilities. Adoption of these amendments is not expected to have a significant impact on the Company's Consolidated Financial Statements.

(IV) IFRIC 22 "Foreign Currency Transactions and Advance Consideration"
IFRIC 22 "Foreign Currency Transactions and Advance Consideration" was issued in December 2016 and will be effective for annual periods beginning on or after January 1, 2018 and may be applied retrospectively or 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. The Company is assessing the impact of this standard.

(V) 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. It 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 expects to defer IFRS 9 until January 1, 2021, as allowed under the amendments to IFRS 4 "Insurance Contracts" outlined below.

(VI) Amendments to IFRS 4 "Insurance Contracts"
Amendments to IFRS 4 "Insurance Contracts" were issued in September 2016, which will be effective for annual periods beginning on or after January 1, 2018. The amendments introduce two approaches to address concerns about the differing effective dates of IFRS 9 "Financial Instruments" and the forthcoming new insurance contracts standard: the overlay approach and the deferral approach. The overlay approach provides an option for all issuers of insurance contracts to adjust profit or loss for eligible financial assets by removing any additional accounting volatility that may arise from applying IFRS 9 before the new insurance contracts standard. The deferral approach provides companies whose activities are predominantly related to insurance an optional temporary exemption from applying IFRS 9 until January 1, 2021. The Company expects to defer IFRS 9 until January 1, 2021.

(VII) Amendments to IAS 12 "Income Taxes"
Amendments to IAS 12 "Income Taxes" were issued in January 2016 and are effective for years beginning on or after January 1, 2017, to be applied retrospectively. The amendments clarify recognition of deferred tax assets relating to unrealized losses on debt instruments measured at fair value. A deductible temporary difference arises when the carrying amount of the debt instrument measured at fair value is less than the cost for tax purposes, irrespective of whether the debt instrument is held for sale or held to maturity. The recognition of the deferred tax asset that arises from this deductible temporary difference is considered in combination with other deferred taxes applying local tax law restrictions where applicable. In addition, when estimating future taxable profits, consideration can be given to recovering more than the asset's carrying amount where probable. Adoption of these amendments is not expected to have a significant impact on the Company's Consolidated Financial Statements.

(VIII) Amendments to IFRS 2 "Share-Based Payment"
Amendments to IFRS 2 "Share-Based Payment" were issued in June 2016 and are effective for annual periods beginning on or after January 1, 2018, to be 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 is not expected to have a significant impact on the Company's Consolidated Financial Statements.

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

IFRS 15 "Revenue from Contracts with Customers" 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 as amended is effective for annual periods beginning on or after January 1, 2018, to be applied as described below.

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. Accordingly, the adoption of IFRS 15 may impact the revenue recognition related to the Company's asset management and service contracts and may result in additional financial statement disclosure.

The amendments clarify when a promised good or service is separately identifiable from other promises in a contract; provide clarifications on how to apply the principal versus agent application guidance; and provide clarifications on how an entity will evaluate the nature of a promise to grant a license of intellectual property to determine whether the promise is satisfied over time or at a point in time.

The amendments provide two practical expedients to alleviate transition burden. An entity that uses the full retrospective approach may apply IFRS 15 only to contracts that are not completed as at the beginning of the earliest period presented. An entity may determine the aggregate effect of all of the modifications that occurred between contract inception and the earliest date presented, rather than accounting for the effects of each modification separately. The Company is assessing the impact of this standard.

Note 3 Acquisitions and Distribution Agreement

(a) Mandatory Provident Fund businesses of Standard Chartered

On November 1, 2016, the Company completed its acquisition of Standard Chartered's Mandatory Provident Fund ("MPF") and Occupational Retirement Schemes Ordinance ("ORSO") businesses in Hong Kong, and the related investment management entity. In addition, on November 1, 2016, the Company commenced its 15 year exclusive distribution partnership with Standard Chartered. These arrangements significantly expand Manulife's retirement business in Hong Kong. Total consideration of $392 was paid in cash.

(b) Distribution agreement with DBS Bank Ltd ("DBS")

Effective January 1, 2016, the Company entered into a 15-year regional distribution agreement with DBS covering Singapore, Hong Kong, mainland China and Indonesia. The arrangement expands the Company's strategy for growth in Asia. The Company recognized $536 of distribution network intangible assets on the agreement's effective date.

(c) Canadian-based operations of Standard Life plc

On January 30, 2015, the Company completed its acquisition of 100 per cent of the shares of Standard Life Financial Inc. and of Standard Life Investments Inc., collectively the Canadian-based operations of Standard Life plc ("Standard Life"). The acquisition contributes to the Company's growth strategy, particularly in wealth and asset management.

The purchase consideration of $4 billion was paid in cash. The Company recognized $1,477 of tangible net assets, $1,010 of intangible assets, and $1,513 of goodwill.

(d) Retirement plan services business of New York Life

On April 14, 2015, the Company completed its acquisition of New York Life's ("NYL") Retirement Plan Services ("RPS") business. The acquisition of the NYL RPS business supports Manulife's global growth strategy for wealth and asset management businesses.

The purchase consideration of $787 included conventional financial consideration of $398 plus $389 of net impact of the assumption by NYL of the Company's in-force participating life insurance closed block ("Closed Block") through net 60% reinsurance agreements, effective July 1, 2015. The Company recognized $128 of intangible assets and $659 of goodwill. Finalization of the purchase price allocation in 2016 did not result in significant changes to amounts recognized.

Note 4 Invested Assets and Investment Income

(a) Carrying values and fair values of invested assets

As at December 31, 2016	FVTPL[1]	AFS[2]	Other[3]	Total carrying value	Total fair value[9]
Cash and short-term securities[4]	**$ 269**	**$ 11,705**	**$ 3,177**	**$ 15,151**	**$ 15,151**
Debt securities[5]					
Canadian government and agency	**18,030**	**6,715**	**–**	**24,745**	**24,745**
U.S. government and agency	**13,971**	**13,333**	**–**	**27,304**	**27,304**
Other government and agency	**18,629**	**2,312**	**–**	**20,941**	**20,941**
Corporate	**87,374**	**5,041**	**–**	**92,415**	**92,415**
Mortgage/asset-backed securities	**2,886**	**331**	**–**	**3,217**	**3,217**
Public equities	**16,531**	**2,965**	**–**	**19,496**	**19,496**
Mortgages	**–**	**–**	**44,193**	**44,193**	**45,665**
Private placements	**–**	**–**	**29,729**	**29,729**	**31,459**
Policy loans	**–**	**–**	**6,041**	**6,041**	**6,041**
Loans to Bank clients	**–**	**–**	**1,745**	**1,745**	**1,746**
Real estate					
Own use property[6]	**–**	**–**	**1,376**	**1,376**	**2,524**
Investment property	**–**	**–**	**12,756**	**12,756**	**12,756**
Other invested assets					
Alternative long-duration assets[7]	**10,707**	**96**	**8,048**	**18,851**	**19,193**
Various other [8]	**164**	**–**	**3,745**	**3,909**	**3,910**
Total invested assets	**$ 168,561**	**$ 42,498**	**$ 110,810**	**$ 321,869**	**$ 326,563**

As at December 31, 2015	FVTPL[1]	AFS[2]	Other[3]	Total carrying value	Total fair value[9]
Cash and short-term securities[4]	$ 574	$ 13,548	$ 3,763	$ 17,885	$ 17,885
Debt securities[5]					
Canadian government and agency	16,965	4,318	–	21,283	21,283
U.S. government and agency	15,964	12,688	–	28,652	28,652
Other government and agency	17,895	1,688	–	19,583	19,583
Corporate	80,269	4,925	–	85,194	85,194
Mortgage/asset-backed securities	2,797	318	–	3,115	3,115
Public equities	14,689	2,294	–	16,983	16,983
Mortgages	–	–	43,818	43,818	45,307
Private placements	–	–	27,578	27,578	29,003
Policy loans	–	–	5,912	5,912	5,912
Loans to Bank clients	–	–	1,778	1,778	1,782
Real estate					
Own use property[6]	–	–	1,379	1,379	2,457
Investment property	–	–	13,968	13,968	13,968
Other invested assets					
Alternative long-duration assets[7]	8,952	76	7,253	16,281	16,261
Various other [8]	163	–	3,934	4,097	4,097
Total invested assets	$ 158,268	$ 39,855	$ 109,383	$ 307,506	$ 311,482

[1] The FVTPL classification was elected for securities backing insurance contract liabilities in order to substantially reduce any accounting mismatch arising from changes in the value of these assets and changes in the value of the related insurance contract liabilities. There would otherwise be a mismatch if the available-for-sale ("AFS") classification was selected 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 property, investment property, equity method accounted investments, oil and gas investments, and leveraged leases. Refer to note 1(e) for further details regarding accounting policy.
[4] Includes short-term securities with maturities of less than one year at acquisition amounting to $3,111 (2015 – $4,796) cash equivalents with maturities of less than 90 days at acquisition amounting to $8,863 (2015 – $9,326) and cash of $3,177 (2015 – $3,763).
[5] Debt securities include securities which were acquired with maturities of less than one year and less than 90 days of $893 and $192, respectively (2015 – $905 and $39, respectively).
[6] Includes accumulated depreciation of $404 (2015 – $366).
[7] Includes investments in private equity of $4,619, power and infrastructure of $6,679, oil and gas of $2,093, timber and agriculture of $4,972 and various other invested assets of $487 (2015 – $3,754, $5,260, $1,740, $5,092 and $435, respectively).
[8] Includes $3,368 (2015 – $3,549) of leveraged leases. Refer to note 1(e) regarding accounting policy.
[9] The methodologies for determining fair value of the Company's invested assets are described in note 1 and note 4(g).

(b) Other invested assets

Other invested assets include investments in associates and joint ventures which were accounted for using the equity method of accounting as follows.

As at December 31,	2016 Carrying value	2016 % of total	2015 Carrying value	2015 % of total
Leveraged leases	**$ 3,369**	**58**	$ 3,549	70
Timber and agriculture	**430**	**8**	423	9
Real estate	**419**	**7**	370	7
Other	**1,562**	**27**	714	14
Total	**$ 5,780**	**100**	$ 5,056	100

The Company's share of profit and dividends from these investments for the year ended December 31, 2016 were $252 and $17, respectively (2015 – $23 and $14, respectively).

(c) Investment income

For the year ended December 31, 2016	FVTPL	AFS	Other[1]	Total	Yields[2]
Cash and short-term securities					**0.7%**
Interest income	**$ 7**	**$ 117**	**$ –**	**$ 124**	
Gains (losses)[3]	**18**	**(18)**	**–**	**–**	
Debt securities					**4.7%**
Interest income	**5,051**	**588**	**–**	**5,639**	
Gains (losses)[3]	**1,658**	**548**	**–**	**2,206**	
Recovery (impairment loss), net	**(18)**	**–**	**–**	**(18)**	
Public equities					**10.6%**
Dividend income	**534**	**58**	**–**	**592**	
Gains (losses)[3]	**1,008**	**201**	**–**	**1,209**	
Impairment loss	**–**	**(48)**	**–**	**(48)**	
Mortgages					**4.1%**
Interest income	**–**	**–**	**1,667**	**1,667**	
Gains (losses)[3]	**–**	**–**	**81**	**81**	
Provision, net	**–**	**–**	**(7)**	**(7)**	
Private placements					**5.4%**
Interest income	**–**	**–**	**1,494**	**1,494**	
Gains (losses)[3]	**–**	**–**	**17**	**17**	
Impairment loss, net	**–**	**–**	**(50)**	**(50)**	
Policy loans	**–**	**–**	**358**	**358**	**6.1%**
Loans to Bank clients					**3.9%**
Interest income	**–**	**–**	**68**	**68**	
Real estate					**4.9%**
Rental income, net of depreciation[4]	**–**	**–**	**523**	**523**	
Gains (losses)[3]	**–**	**–**	**160**	**160**	
Derivatives					**n/a**
Interest income, net	**1,115**	**–**	**(33)**	**1,082**	
Gains (losses)[3]	**(2,597)**	**–**	**–**	**(2,597)**	
Other invested assets					**10.3%**
Interest income	**–**	**–**	**103**	**103**	
Oil and gas, timber, agriculture and other income	**–**	**–**	**1,162**	**1,162**	
Gains (losses)[3]	**634**	**1**	**207**	**842**	
Impairment loss, net	**–**	**–**	**(83)**	**(83)**	
Total investment income	**$ 7,410**	**$ 1,447**	**$ 5,667**	**$ 14,524**	**4.7%**
Investment income					
Interest income	**$ 6,173**	**$ 703**	**$ 3,657**	**$ 10,533**	**3.4%**
Dividend, rental and other income	**534**	**58**	**1,685**	**2,277**	**0.7%**
Impairments and provisions for loan losses	**(18)**	**(48)**	**(140)**	**(206)**	**(0.1%)**
Other	**(6)**	**707**	**85**	**786**	**0.2%**
	6,683	**1,420**	**5,287**	**13,390**	
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on macro equity hedges					
Debt securities	**1,657**	**5**	**–**	**1,662**	**0.5%**
Public equities	**963**	**22**	**–**	**985**	**0.3%**
Mortgages	**–**	**–**	**80**	**80**	**0.0%**
Private placements	**–**	**–**	**12**	**12**	**0.0%**
Real estate	**–**	**–**	**128**	**128**	**0.0%**
Other invested assets	**688**	**–**	**160**	**848**	**0.3%**
Derivatives, including macro equity hedging program	**(2,581)**	**–**	**–**	**(2,581)**	**(0.8%)**
	727	**27**	**380**	**1,134**	
Total investment income	**$ 7,410**	**$ 1,447**	**$ 5,667**	**$ 14,524**	**4.7%**

For the year ended December 31, 2015	FVTPL	AFS	Other[1]	Total	Yields[2]
Cash and short-term securities					1.8%
Interest income	$ 10	$ 92	$ –	$ 102	
Gains (losses)[3]	(13)	220	–	207	
Debt securities					1.0%
Interest income	4,849	529	–	5,378	
Gains (losses)[3]	(3,969)	106	–	(3,863)	
Recovery (impairment loss), net	(13)	4	–	(9)	
Public equities					1.0%
Dividend income	434	59	–	493	
Gains (losses)[3]	(551)	257	–	(294)	
Impairment loss	–	(32)	–	(32)	
Mortgages					4.7%
Interest income	–	–	1,758	1,758	
Gains (losses)[3]	–	–	279	279	
Private placements					5.6%
Interest income	–	–	1,375	1,375	
Gains (losses)[3]	–	–	97	97	
Impairment loss, net	–	–	(37)	(37)	
Policy loans	–	–	388	388	6.1%
Loans to Bank clients					3.9%
Interest income	–	–	69	69	
Provision, net	–	–	(1)	(1)	
Real estate					11.5%
Rental income, net of depreciation[4]	–	–	509	509	
Gains (losses)[3]	–	–	946	946	
Derivatives					n/a
Interest income, net	964	–	(32)	932	
Gains (losses)[3]	(394)	–	(118)	(512)	
Other invested assets					3.4%
Interest income	–	–	112	112	
Oil and gas, timber, agriculture and other income	–	–	891	891	
Gains (losses)[3]	111	3	55	169	
Impairment loss, net	(3)	–	(551)	(554)	
Total investment income	$ 1,425	$ 1,238	$ 5,740	$ 8,403	2.9%
Investment income					
Interest income	$ 5,823	$ 621	$ 3,670	$ 10,114	3.4%
Dividend, rental and other income	434	59	1,400	1,893	0.6%
Impairments and provisions for loan losses	(16)	(28)	(589)	(633)	(0.2%)
Other	(376)	549	(82)	91	0.0%
	5,865	1,201	4,399	11,465	
Realized and unrealized gains (losses) on assets supporting insurance and investment contract liabilities and on macro equity hedges					
Debt securities	(3,969)	12	–	(3,957)	(1.3%)
Public equities	(538)	25	–	(513)	(0.2%)
Mortgages	–	–	278	278	0.1%
Private placements	–	–	95	95	0.0%
Real estate	–	–	980	980	0.3%
Other invested assets	249	–	106	355	0.1%
Derivatives, including macro equity hedging program	(182)	–	(118)	(300)	(0.1%)
	(4,440)	37	1,341	(3,062)	
Total investment income	$ 1,425	$ 1,238	$ 5,740	$ 8,403	2.9%

(1) Primarily includes assets classified as loans and carried at amortized cost, own use property, investment property, derivative and hedging instruments in cash flow hedging relationships, equity method accounted investments, oil and gas investments, and leveraged leases.
(2) Yields are based on income and are calculated using the geometric average of assets held at carrying value during the reporting year.
(3) Includes net realized gains (losses) as well as net 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.
(4) Rental income from investment properties is net of direct operating expenses and includes net market rental income on own use properties.

(d) Investment expenses

The following table presents total investment expenses of the Company.

For the years ended December 31,	2016	2015
Related to invested assets	$ 581	$ 572
Related to segregated, mutual and other funds	1,065	1,043
Total investment expenses	**$ 1,646**	$ 1,615

(e) Investment properties

The following table identifies the amounts included in investment income relating to investment properties.

For the years ended December 31,	2016	2015
Rental income from investment properties	$ 1,204	$ 1,164
Direct operating expenses of investment properties that generated rental income	(764)	(719)
Total	**$ 440**	$ 445

(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"), as well as through a HELOC securitization program.

Benefits received from the securitization include interest spread between the asset and associated liability. There are no expected credit losses on mortgages that have been securitized 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.

The carrying amount of securitized assets reflecting the Company's continuing involvement with the mortgages and the associated liabilities is as follows.

As at December 31, 2016	Securitized assets			
Securitization program	Securitized mortgages	Restricted cash and short-term securities	Total	Secured borrowing liabilities[2]
HELOC securitization[1]	**$ 1,762**	**$ 8**	**$ 1,770**	**$ 1,750**
CMB securitization	**1,018**	**–**	**1,018**	**1,032**
Total	**$ 2,780**	**$ 8**	**$ 2,788**	**$ 2,782**

	Securitized assets			
As at December 31, 2015	Securitized mortgages	Restricted cash and short-term securities	Total	Secured borrowing liabilities[2]
HELOC securitization[1]	$ 1,500	$ 8	$ 1,508	$ 1,500
CMB securitization	436	–	436	436
Total	$ 1,936	$ 8	$ 1,944	$ 1,936

[1] Manulife Bank, an 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 Canada Mortgage and Housing Corporation ("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] The 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 the CMB program by selling NHA MBS securities to Canada Housing Trust ("CHT"), as a source of fixed rate funding.

Fair value of the securitized assets as at December 31, 2016 was $2,821 (2015 – $1,964) and the fair value of the associated liabilities was $2,776 (2015 – $1,937).

(g) Fair value measurement

The following table presents fair value of the Company's invested assets and segregated funds net assets, measured at fair value in the Consolidated Statements of Financial Position and categorized by hierarchy.

As at December 31, 2016	Total fair value	Level 1	Level 2	Level 3
Cash and short-term securities				
FVTPL	**$ 269**	**$ –**	**$ 269**	**$ –**
AFS	**11,705**	**–**	**11,705**	**–**
Other	**3,177**	**3,177**	**–**	**–**
Debt securities[1]				
FVTPL				
Canadian government and agency	**18,030**	**–**	**16,392**	**1,638**
U.S. government and agency	**13,971**	**–**	**13,169**	**802**
Other government and agency	**18,629**	**–**	**18,199**	**430**
Corporate	**87,374**	**2**	**84,174**	**3,198**
Residential mortgage/asset-backed securities	**10**	**–**	**8**	**2**
Commercial mortgage/asset-backed securities	**680**	**–**	**255**	**425**
Other securitized assets	**2,196**	**–**	**2,153**	**43**
AFS				
Canadian government and agency	**6,715**	**–**	**6,470**	**245**
U.S. government and agency	**13,333**	**–**	**13,323**	**10**
Other government and agency	**2,312**	**–**	**2,260**	**52**
Corporate	**5,041**	**–**	**4,791**	**250**
Residential mortgage/asset-backed securities	**65**	**–**	**64**	**1**
Commercial mortgage/asset-backed securities	**123**	**–**	**48**	**75**
Other securitized assets	**143**	**–**	**141**	**2**
Public equities				
FVTPL	**16,531**	**16,524**	**0**	**7**
AFS	**2,965**	**2,963**	**2**	**–**
Real estate – investment property[2]	**12,756**	**–**	**–**	**12,756**
Other invested assets[3]	**14,849**	**–**	**–**	**14,849**
Segregated funds net assets[4]	**315,177**	**278,066**	**32,537**	**4,574**
Total	**$ 546,051**	**$ 300,732**	**$ 205,960**	**$ 39,359**

As at December 31, 2015	Total fair value	Level 1	Level 2	Level 3
Cash and short-term securities				
FVTPL	$ 574	$ –	$ 574	$ –
AFS	13,548	–	13,548	–
Other	3,763	3,763	–	–
Debt securities[1]				
FVTPL				
Canadian government and agency	16,965	–	15,299	1,666
U.S. government and agency	15,964	–	15,119	845
Other government and agency	17,895	–	17,483	412
Corporate	80,269	2	76,296	3,971
Residential mortgage/asset-backed securities	27	–	12	15
Commercial mortgage/asset-backed securities	718	–	207	511
Other securitized assets	2,052	–	2,004	48
AFS				
Canadian government and agency	4,318	–	4,165	153
U.S. government and agency	12,688	–	12,675	13
Other government and agency	1,688	–	1,645	43
Corporate	4,925	–	4,607	318
Residential mortgage/asset-backed securities	49	–	41	8
Commercial mortgage/asset-backed securities	123	–	27	96
Other securitized assets	146	–	141	5
Public equities				
FVTPL	14,689	14,686	2	1
AFS	2,294	2,292	2	–
Real estate – investment property[2]	13,968	–	–	13,968
Other invested assets[3]	12,977	–	–	12,977
Segregated funds net assets[4]	313,249	277,779	30,814	4,656
Total	$ 532,889	$ 298,522	$ 194,661	$ 39,706

[1] The debt securities included in Level 3 consist primarily of maturities greater than 30 years for which the Treasury yield curve is not observable and is extrapolated, as well as debt securities where only unobservable single quoted broker prices are provided.

[2] For investment property, the significant unobservable inputs are capitalization rates (ranging from 3.75% to 9.75% during the year and ranging from 3.75% to 9.50% for the year 2015) and terminal capitalization rates (ranging from 4.1% to 10.00% during the year and ranging from 4.5% to 9.75% during the year 2015). 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.

(3) 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 9.63% to 16.0% (2015 – ranged from 10.05% to 16.0%). 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 7.5% (2015 – 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.

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

For invested assets not measured at fair value in the Consolidated Statements of Financial Position, the following tables disclose the summarized fair value information categorized by hierarchy, together with the related carrying values.

As at December 31, 2016	Carrying value	Total fair value	Level 1	Level 2	Level 3
Mortgages[1]	**$ 44,193**	**$ 45,665**	**$ –**	**$ –**	**$ 45,665**
Private placements[2]	**29,729**	**31,459**	**–**	**25,699**	**5,760**
Policy loans[3]	**6,041**	**6,041**	**–**	**6,041**	**–**
Loans to Bank clients[4]	**1,745**	**1,746**	**–**	**1,746**	**–**
Real estate – own use property[5]	**1,376**	**2,524**	**–**	**–**	**2,524**
Other invested assets[6]	**7,911**	**8,254**	**–**	**–**	**8,254**
Total invested assets disclosed at fair value	**$ 90,995**	**$ 95,689**	**$ –**	**$ 33,486**	**$ 62,203**

As at December 31, 2015	Carrying value	Total fair value	Level 1	Level 2	Level 3
Mortgages[1]	$ 43,818	$ 45,307	$ –	$ –	$ 45,307
Private placements[2]	27,578	29,003	–	23,629	5,374
Policy loans[3]	5,912	5,912	–	5,912	–
Loans to Bank clients[4]	1,778	1,782	–	1,782	–
Real estate – own use property[5]	1,379	2,457	–	–	2,457
Other invested assets[6]	7,401	7,381	–	–	7,381
Total invested assets disclosed at fair value	$ 87,866	$ 91,842	$ –	$ 31,323	$ 60,519

(1) Fair value of commercial mortgages is derived 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 derived 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 level of the fair value hierarchy are calculated in accordance with the methodologies described for real estate – investment property in note 1.

(6) Other invested assets disclosed at fair value primarily include leveraged leases, oil and gas properties and equity method accounted other invested assets. Fair value of leveraged leases is shown 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's policy is to record transfers of assets and liabilities between Level 1 and Level 2 at their fair values as at the end of each reporting period, consistent with the date of the determination of fair value. Assets are transferred out of Level 1 when they are no longer transacted with sufficient frequency and volume in an active market. During the year ended December 31, 2016, the Company transferred nil (2015 – nil) of assets measured at fair value from Level 1 to Level 2. Conversely, assets are transferred from Level 2 to Level 1 when transaction volume and frequency are indicative of an active market. The Company transferred nil (2015 – nil) of assets from Level 2 to Level 1 during the year ended December 31, 2016.

For segregated funds net assets, the Company had $8 transfers from Level 1 to Level 2 for the year ended December 31, 2016 (2015 – nil). The Company had nil transfers from Level 2 to Level 1 for the year ended December 31, 2016 (2015 – $43).

Invested assets and segregated funds net assets measured at fair value on the Consolidated Statements of Financial Position using significant unobservable inputs (Level 3)

The Company classifies the 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, the majority 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 and, therefore, the gains and losses in the tables below include changes in fair value due to both observable and unobservable factors.

The following tables present a roll forward of all invested assets and segregated funds net assets measured at fair value using significant unobservable inputs (Level 3) for the years ended December 31, 2016 and 2015.

For the year ended December 31, 2016	Balance as at January 1, 2016	Net realized / unrealized gains (losses) included in net income[1]	Net realized / unrealized gains (losses) included in AOCI[2]	Purchases[3]	Sales[4]	Settlements	Transfer into Level 3[5]	Transfer out of Level 3[5]	Currency movement	**Balance as at December 31, 2016**	Change in unrealized gains (losses) on assets still held
Debt securities											
FVTPL											
Canadian government & agency	**$ 1,666**	**$ (16)**	**$ –**	**$ 233**	**$ (49)**	**$ –**	**$ –**	**$ (196)**	**$ –**	**$ 1,638**	**$ (62)**
U.S. government & agency	**845**	**9**	**–**	**39**	**–**	**–**	**–**	**(70)**	**(21)**	**802**	**10**
Other government & agency	**412**	**(2)**	**–**	**122**	**(41)**	**(30)**	**–**	**(1)**	**(30)**	**430**	**(4)**
Corporate	**3,971**	**(74)**	**–**	**634**	**(158)**	**(165)**	**58**	**(1,015)**	**(53)**	**3,198**	**(44)**
Residential mortgage/ asset-backed securities	**15**	**(1)**	**–**	**–**	**(11)**	**(1)**	**–**	**–**	**–**	**2**	**1**
Commercial mortgage/ asset-backed securities	**511**	**(4)**	**–**	**132**	**(56)**	**(4)**	**–**	**(146)**	**(8)**	**425**	**(4)**
Other securitized assets	**48**	**(1)**	**–**	**10**	**(1)**	**(9)**	**–**	**(4)**	**–**	**43**	**(1)**
	7,468	**(89)**	**–**	**1,170**	**(316)**	**(209)**	**58**	**(1,432)**	**(112)**	**6,538**	**(104)**
AFS											
Canadian government & agency	**153**	**36**	**(47)**	**199**	**(96)**	**–**	**–**	**–**	**–**	**245**	**–**
U.S. government & agency	**13**	**–**	**–**	**–**	**–**	**–**	**–**	**(3)**	**–**	**10**	**–**
Other government & agency	**43**	**–**	**–**	**18**	**(6)**	**–**	**–**	**–**	**(3)**	**52**	**–**
Corporate	**318**	**(2)**	**(5)**	**29**	**(32)**	**(3)**	**–**	**(50)**	**(5)**	**250**	**–**
Residential mortgage/ asset-backed securities	**8**	**(1)**	**1**	**–**	**(6)**	**–**	**–**	**–**	**(1)**	**1**	**–**
Commercial mortgage/ asset-backed securities	**96**	**–**	**–**	**19**	**–**	**(1)**	**–**	**(37)**	**(2)**	**75**	**–**
Other securitized assets	**5**	**–**	**2**	**–**	**–**	**(1)**	**–**	**(4)**	**–**	**2**	**–**
	636	**33**	**(49)**	**265**	**(140)**	**(5)**	**–**	**(94)**	**(11)**	**635**	**–**
Public equities											
FVTPL	**1**	**–**	**–**	**6**	**–**	**–**	**–**	**–**	**–**	**7**	**–**
AFS	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
	1	**–**	**–**	**6**	**–**	**–**	**–**	**–**	**–**	**7**	**–**
Real estate – investment property	**13,968**	**163**	**–**	**681**	**(1,782)**	**–**	**–**	**–**	**(274)**	**12,756**	**197**
Other invested assets	**12,977**	**786**	**9**	**2,171**	**(76)**	**(685)**	**–**	**–**	**(333)**	**14,849**	**847**
	26,945	**949**	**9**	**2,852**	**(1,858)**	**(685)**	**–**	**–**	**(607)**	**27,605**	**1,044**
Segregated funds net assets	**4,656**	**92**	**–**	**356**	**(312)**	**(19)**	**(12)**	**(105)**	**(82)**	**4,574**	**93**
Total	**$ 39,706**	**$ 985**	**$ (40)**	**$ 4,649**	**$ (2,626)**	**$ (918)**	**$ 46**	**$ (1,631)**	**$ (812)**	**$ 39,359**	**$ 1,033**

For the year ended December 31, 2015	Balance as at January 1, 2015	Net realized / unrealized gains (losses) included in net income[1]	Net realized / unrealized gains (losses) included in AOCI[2]	Purchases[3]	Sales[4]	Settlements	Transfer into Level 3[5]	Transfer out of Level 3[5]	Currency movement	Balance as at December 31, 2015	Change in unrealized gains (losses) on assets still held
Debt securities											
FVTPL											
Canadian government & agency	$ 1,006	$ (267)	$ –	$ 2,753	$ (839)	$ –	$ –	$ (987)	$ –	$ 1,666	$ (317)
U.S. government & agency	808	(52)	–	–	(15)	–	–	(35)	139	845	(52)
Other government & agency	437	5	–	54	(83)	(7)	–	(6)	12	412	4
Corporate	3,150	(313)	–	1,574	(96)	(91)	53	(588)	282	3,971	(279)
Residential mortgage/asset-backed securities	133	1	–	–	(122)	(22)	1	–	24	15	9
Commercial mortgage/asset-backed securities	577	(18)	–	141	(157)	(85)	–	(43)	96	511	(26)
Other securitized assets	61	–	–	–	(13)	(18)	6	–	12	48	–
	6,172	(644)	–	4,522	(1,325)	(223)	60	(1,659)	565	7,468	(661)
AFS											
Canadian government & agency	884	62	76	466	(728)	–	–	(607)	–	153	–
U.S. government & agency	12	–	(1)	–	–	–	–	–	2	13	–
Other government & agency	54	–	(1)	10	(17)	(1)	–	(1)	(1)	43	–
Corporate	234	(1)	62	28	(11)	(15)	16	(5)	10	318	–
Residential mortgage/asset-backed securities	28	2	(1)	–	(20)	(7)	–	–	6	8	–
Commercial mortgage/asset-backed securities	83	1	14	19	(21)	(12)	–	(3)	15	96	–
Other securitized assets	13	–	–	–	(5)	(11)	5	–	3	5	–
	1,308	64	149	523	(802)	(46)	21	(616)	35	636	–
Public equities											
FVTPL	2	(1)	–	–	–	–	–	–	–	1	(1)
AFS	–	–	–	2	(2)	–	–	–	–	–	–
	2	(1)	–	2	(2)	–	–	–	–	1	(1)
Real estate – investment property	9,270	1,000	–	2,645	(106)	–	–	–	1,159	13,968	988
Other invested assets	10,231	177	(1)	2,067	(537)	(625)	–	–	1,665	12,977	(57)
	19,501	1,177	(1)	4,712	(643)	(625)	–	–	2,824	26,945	931
Segregated funds net assets	2,591	265	–	2,134	(821)	8	5	–	474	4,656	248
Total	$ 29,574	$ 861	$ 148	$ 11,893	$ (3,593)	$ (886)	$ 86	$ (2,275)	$ 3,898	$ 39,706	$ 517

[1] These amounts, except for the amount related to segregated funds net assets, are included in net investment income on the Consolidated Statements of Income.
[2] These amounts are included in AOCI on the Consolidated Statements of Financial Position.
[3] Purchases in 2015 include assets acquired from Standard Life.
[4] Sales in 2016 include $1,011 of U.S. commercial real estate sold to the Manulife U.S. REIT in Singapore, an associate of the Company which is a structured entity based on unitholder voting rights. The Company provides management services to the REIT and owns approximately 9.5% of its equity.
[5] For assets that are transferred into and/or out of Level 3, the Company uses the fair value 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 5 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 2016 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 taking into account the effects of netting agreements and collateral arrangements.

The gross notional amount and the fair value of derivative contracts by the underlying risk exposure for derivatives in qualifying hedging and derivatives not designated in qualifying hedging relationships are summarized in the following table.

As at December 31,		2016			2015		
		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	**$ 2,158**	**$ –**	**$ 477**	$ 2,077	$ 1	$ 553
	Foreign currency swaps	**91**	**1**	**3**	95	1	3
Cash flow hedges	Foreign currency swaps	**1,285**	**–**	**447**	826	–	476
	Forward contracts	**255**	**–**	**23**	351	–	43
	Equity contracts	**126**	**21**	**1**	98	–	3
Total derivatives in qualifying hedge accounting relationships		**3,915**	**22**	**951**	3,447	2	1,078
Derivatives not designated in qualifying hedge accounting relationships							
	Interest rate swaps	**281,188**	**21,900**	**10,878**	315,230	22,771	11,935
	Interest rate futures	**11,616**	**–**	**–**	9,455	–	–
	Interest rate options	**9,390**	**376**	**–**	5,887	200	–
	Foreign currency swaps	**12,226**	**347**	**1,645**	9,382	331	1,758
	Currency rate futures	**4,729**	**–**	**–**	5,746	–	–
	Forward contracts	**15,411**	**340**	**644**	13,393	520	241
	Equity contracts	**14,989**	**669**	**33**	11,251	438	38
	Credit default swaps	**662**	**18**	**–**	748	10	–
	Equity futures	**16,072**	**–**	**–**	19,553	–	–
Total derivatives not designated in qualifying hedge accounting relationships		**366,283**	**23,650**	**13,200**	390,645	24,270	13,972
Total derivatives		**$ 370,198**	**$ 23,672**	**$ 14,151**	$ 394,092	$ 24,272	$ 15,050

Fair value of derivative instruments is summarized by term to maturity in the following tables. Fair values shown do not incorporate the impact of master netting agreements. Refer to note 10.

	Term to maturity				
As at December 31, 2016	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Derivative assets	**$ 467**	**$ 680**	**$ 719**	**$ 21,806**	**$ 23,672**
Derivative liabilities	**593**	**595**	**511**	**12,452**	**14,151**

	Term to maturity				
As at December 31, 2015	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Derivative assets	$ 362	$ 689	$ 593	$ 22,628	$ 24,272
Derivative liabilities	298	676	632	13,444	15,050

As at December 31, 2016	Remaining term to maturity (notional amounts) Under 1 year	1 to 5 years	Over 5 years	Total	Fair value Positive	Negative	Net	Credit risk equivalent[1]	Risk-weighted amount[2]
Interest rate contracts									
OTC swap contracts	**$ 13,244**	**$ 37,395**	**$ 164,252**	**$ 214,891**	**$ 19,327**	**$ (10,154)**	**$ 9,173**	**$ 10,205**	**$ 1,493**
Cleared swap contracts	**717**	**4,786**	**62,952**	**68,455**	**3,507**	**(2,117)**	**1,390**	**–**	**–**
Forward contracts	**7,229**	**6,143**	**873**	**14,245**	**326**	**(629)**	**(303)**	**192**	**29**
Futures	**11,616**	**–**	**–**	**11,616**	**–**	**–**	**–**	**–**	**–**
Options purchased	**483**	**2,927**	**5,980**	**9,390**	**376**	**–**	**376**	**458**	**70**
Subtotal	**33,289**	**51,251**	**234,057**	**318,597**	**23,536**	**(12,900)**	**10,636**	**10,855**	**1,592**
Foreign exchange									
Swap contracts	**425**	**3,917**	**9,259**	**13,601**	**346**	**(2,120)**	**(1,774)**	**1,491**	**181**
Forward contracts	**1,257**	**165**	**–**	**1,422**	**13**	**(38)**	**(25)**	**62**	**9**
Futures	**4,729**	**–**	**–**	**4,729**	**–**	**–**	**–**	**–**	**–**
Credit derivatives	**47**	**615**	**–**	**662**	**18**	**–**	**18**	**–**	**–**
Equity contracts									
Swap contracts	**3,107**	**192**	**–**	**3,299**	**64**	**(35)**	**29**	**495**	**54**
Futures	**16,072**	**–**	**–**	**16,072**	**–**	**–**	**–**	**–**	**–**
Options purchased	**6,007**	**5,809**	**–**	**11,816**	**626**	**(2)**	**624**	**2,735**	**358**
Subtotal including accrued interest	**64,933**	**61,949**	**243,316**	**370,198**	**24,603**	**(15,095)**	**9,508**	**15,638**	**2,194**
Less accrued interest	**–**	**–**	**–**	**–**	**931**	**(944)**	**(13)**	**–**	**–**
Total	**$ 64,933**	**$ 61,949**	**$ 243,316**	**$ 370,198**	**$ 23,672**	**$ (14,151)**	**$ 9,521**	**$ 15,638**	**$ 2,194**

As at December 31, 2015	Remaining term to maturity (notional amounts) Under 1 year	1 to 5 years	Over 5 years	Total	Fair value Positive	Negative	Net	Credit risk equivalent[1]	Risk-weighted amount[2]
Interest rate contracts									
OTC swap contracts	$ 14,646	$ 33,625	$ 172,579	$ 220,850	$ 20,006	$ (10,684)	$ 9,322	$ 10,680	$ 1,555
Cleared swap contracts	7,160	22,043	67,255	96,458	3,828	(2,739)	1,089	–	–
Interest rate forwards	3,145	6,851	1,695	11,691	503	(212)	291	252	38
Futures	9,455	–	–	9,455	–	–	–	–	–
Options purchased	–	–	5,886	5,886	199	–	199	373	56
Subtotal	34,406	62,519	247,415	344,340	24,536	(13,635)	10,901	11,305	1,649
Foreign exchange									
Swap contracts	711	2,740	6,851	10,302	333	(2,255)	(1,922)	1,298	162
Forward contracts	1,739	315	–	2,054	17	(73)	(56)	112	15
Futures	5,746	–	–	5,746	–	–	–	–	–
Credit derivatives	298	450	–	748	10	–	10	–	–
Equity contracts									
Swap contracts	2,280	124	–	2,404	14	(22)	(8)	404	44
Futures	19,553	–	–	19,553	–	–	–	–	–
Options purchased	4,205	4,740	–	8,945	422	(18)	404	2,184	285
Subtotal including accrued interest	68,938	70,888	254,266	394,092	25,332	(16,003)	9,329	15,303	2,155
Less accrued interest	–	–	–	–	1,060	(953)	107	–	–
Total	$ 68,938	$ 70,888	$ 254,266	$ 394,092	$ 24,272	$ (15,050)	$ 9,222	$ 15,303	$ 2,155

[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 value of $370 billion (2015 – $394 billion) includes $177 billion (2015 – $225 billion) related to derivatives utilized in the Company's variable annuity guarantee dynamic hedging and macro equity risk hedging programs. As a result of 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.

The following table presents the fair value of derivative contracts categorized by hierarchy.

As at December 31, 2016	Total fair value	Level 1	Level 2	Level 3
Derivative assets				
Interest rate contracts	**$ 22,602**	**$ –**	**$ 22,045**	**$ 557**
Foreign exchange contracts	**362**	**–**	**361**	**1**
Equity contracts	**690**	**–**	**182**	**508**
Credit default swaps	**18**	**–**	**18**	**–**
Total derivative assets	**$ 23,672**	**$ –**	**$ 22,606**	**$ 1,066**
Derivative liabilities				
Interest rate contracts	**$ 11,984**	**$ –**	**$ 11,114**	**$ 870**
Foreign exchange contracts	**2,133**	**–**	**2,133**	**–**
Equity contracts	**34**	**–**	**1**	**33**
Total derivative liabilities	**$ 14,151**	**$ –**	**$ 13,248**	**$ 903**

As at December 31, 2015	Total fair value	Level 1	Level 2	Level 3
Derivative assets				
Interest rate contracts	$ 23,475	$ –	$ 22,767	$ 708
Foreign exchange contracts	349	–	339	10
Equity contracts	438	–	79	359
Credit default swaps	10	–	10	–
Total derivative assets	$ 24,272	$ –	$ 23,195	$ 1,077
Derivative liabilities				
Interest rate contracts	$ 12,700	$ –	$ 11,997	$ 703
Foreign exchange contracts	2,309	–	2,309	–
Equity contracts	41	–	17	24
Total derivative liabilities	$ 15,050	$ –	$ 14,323	$ 727

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,	2016	2015
Balance at the beginning of the year	**$ 350**	$ 1,105
Net realized / unrealized gains (losses) included in:		
Net income[1]	**47**	(477)
OCI[2]	**40**	(20)
Purchases	**373**	47
Sales	**(522)**	(301)
Transfers		
Into Level 3[3]	**–**	–
Out of Level 3[3]	**(116)**	(100)
Currency movement	**(9)**	96
Balance at the end of the year	**$ 163**	$ 350
Change in unrealized gains (losses) on instruments still held	**$ 145**	$ (386)

[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 items that are 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 for 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 caused by 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.

Derivatives in qualifying fair value hedging relationships

For the year ended December 31, 2016	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	**$ (52)**	**$ 30**	**$ (22)**
	Fixed rate liabilities	**(1)**	**1**	**–**
Foreign currency swaps	Fixed rate assets	**–**	**2**	**2**
Total		**$ (53)**	**$ 33**	**$ (20)**

For the year ended December 31, 2015		Gains (losses) recognized on derivatives	Gains (losses) recognized for hedged items	Ineffectiveness recognized in investment income
Interest rate swaps	Fixed rate assets	$ (147)	$ 105	$ (42)
	Fixed rate liabilities	(2)	2	–
Foreign currency swaps	Fixed rate assets	14	(13)	1
Total		$ (135)	$ 94	$ (41)

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.

Derivatives in qualifying cash flow hedging relationships

For the year ended December 31, 2016	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	**$ –**	**$ (18)**	**$ –**
Foreign currency swaps	Fixed rate assets	**(4)**	**–**	**–**
	Floating rate liabilities	**47**	**23**	**–**
	Fixed rate liabilities	**(15)**	**(8)**	**–**
Forward contracts	Forecasted expenses	**7**	**(14)**	**–**
Equity contracts	Stock-based compensation	**39**	**(1)**	**–**
Non-derivative financial instrument	Forecasted expenses	**–**	**3**	**–**
Total		**$ 74**	**$ (15)**	**$ –**

For the year ended December 31, 2015		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	$ (9)	$ (15)	$ –
Foreign currency swaps	Fixed rate assets	2	(1)	–
	Floating rate liabilities	(195)	(126)	–
Forward contracts	Forecasted expenses	(44)	(4)	–
Equity contracts	Stock-based compensation	(7)	14	–
Non-derivative financial instrument	Forecasted expenses	3	–	–
Total		$ (250)	$ (132)	$ –

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 20 years.

Hedges of net investments in foreign operations

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

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

Hedging instruments in net investment hedging relationships

For the year ended December 31, 2016	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	**$ (25)**	**$ –**	**$ –**
Total	**$ (25)**	**$ –**	**$ –**

For the year ended December 31, 2015	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	$ (158)	$ –	$ –
Total	$ (158)	$ –	$ –

(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. Given the 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.

The effects of derivatives not designated in qualifying hedge accounting relationships on the Consolidated Statements of Income are shown in the following table.

Derivatives not designated in qualifying hedge accounting relationships

For the years ended December 31,	2016	2015
Investment income (loss)		
Interest rate swaps	**$ (141)**	$ 978
Interest rate futures	**(26)**	(83)
Interest rate options	**(11)**	23
Foreign currency swaps	**(14)**	(590)
Currency rate futures	**263**	(97)
Forward contracts	**(88)**	(371)
Equity futures	**(2,387)**	(36)
Equity contracts	**(171)**	(194)
Credit default swaps	**1**	(5)
Total	**$ (2,574)**	$ (375)

(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 are considered to 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, 2016, reinsurance ceded guaranteed minimum income benefits had a fair value of $1,408 (2015 – $1,574) and reinsurance assumed guaranteed minimum income benefits had a fair value of $119 (2015 – $127). Claims recovered under reinsurance ceded contracts offset the 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, 2016, these embedded derivatives had a fair value of $218 (2015 – $170).

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 6 Income Taxes

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

Income tax recognized in the Consolidated Statements of Income:

For the years ended December 31,	2016	2015
Current tax		
Current year	**$ 659**	$ 615
Adjustments to prior year[1]	**(228)**	56
	431	671
Deferred tax		
Change related to temporary differences	**(222)**	(293)
Effects of changes in tax rates	**(13)**	(50)
Income tax expense	**$ 196**	$ 328

[1] Adjustments relating to closure of multiple taxation years.

Income tax recognized in Other Comprehensive Income ("OCI"):

For the years ended December 31,	2016	2015
Current income tax recovery	**$ (72)**	$ (139)
Deferred income tax recovery	**(25)**	(104)
Income tax recovery	**$ (97)**	$ (243)

Income tax recognized directly in Equity:

For the years ended December 31,	2016	2015
Current income tax expense (recovery)	**$ (2)**	$ 50
Deferred income tax recovery	**(2)**	(48)
Income tax expense (recovery)	**$ (4)**	$ 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, 2016 (2015 – 26.75 per cent) and the reasons are shown below.

Reconciliation of income tax expense

For the years ended December 31,	2016	2015
Income before income taxes	**$ 3,329**	$ 2,618
Income tax expense at Canadian statutory tax rate	**$ 890**	$ 700
Increase (decrease) in income taxes due to:		
Tax-exempt investment income	**(229)**	(231)
Differences in tax rate on income not subject to tax in Canada	**(366)**	(104)
General business tax credits	**(4)**	(21)
Recovery of unrecognized tax losses of prior years	**(10)**	(38)
Adjustments to taxes related to prior years	**(151)**	(32)
Tax losses and temporary differences not recognized as deferred taxes	**22**	–
Other differences	**44**	54
Income tax expense	**$ 196**	$ 328

(b) Current tax receivable and payable

As at December 31, 2016, the Company has approximately $446 of current tax receivable included in other assets (2015 – $198) and a current tax payable of $387 included in other liabilities (2015 – $527).

(c) Deferred tax assets and liabilities

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

As at December, 31	2016	2015
Deferred tax assets	**$ 4,439**	$ 4,067
Deferred tax liabilities	**(1,359)**	(1,235)
Net deferred tax assets	**$ 3,080**	$ 2,832

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

As at December 31, 2016	Balance January 1, 2016	Acquired in Business combinations	Recognized in Income Statement	Recognized in Other Comprehensive Income	Recognized in equity	Translation and other	Balance at December 31, 2016
Loss carry forwards	**$ 1,493**	**$ –**	**$ (515)**	**$ –**	**$ –**	**$ (36)**	**$ 942**
Actuarial liabilities	**9,448**	**–**	**244**	**(5)**	**(116)**	**(205)**	**9,366**
Pensions and post-employment benefits	**329**	**–**	**100**	**(79)**	**–**	**2**	**352**
Tax credits	**750**	**–**	**147**	**–**	**–**	**(22)**	**875**
Accrued interest	**121**	**–**	**(100)**	**–**	**–**	**(4)**	**17**
Real estate	**(1,812)**	**–**	**373**	**–**	**–**	**43**	**(1,396)**
Securities and other investments	**(6,160)**	**–**	**(258)**	**113**	**112**	**172**	**(6,021)**
Sale of investments	**(200)**	**–**	**37**	**–**	**–**	**–**	**(163)**
Goodwill and intangible assets	**(1,138)**	**–**	**58**	**–**	**–**	**21**	**(1,059)**
Other	**1**	**–**	**149**	**(4)**	**6**	**15**	**167**
Total	**$ 2,832**	**$ –**	**$ 235**	**$ 25**	**$ 2**	**$ (14)**	**$ 3,080**

As at December 31, 2015	Balance January 1, 2015	Acquired in Business combinations	Recognized in Income Statement	Recognized in Other Comprehensive Income	Recognized in equity	Translation and other	Balance at December 31, 2015
Loss carry forwards	$ 1,662	$ –	$ (472)	$ –	$ 2	$ 301	$ 1,493
Actuarial liabilities	5,935	315	2,374	–	37	787	9,448
Pensions and post-employment benefits	277	58	(6)	4	–	(4)	329
Tax credits	535	–	105	–	–	110	750
Accrued interest	105	–	(3)	–	–	19	121
Real estate	(1,162)	(97)	(363)	(1)	–	(189)	(1,812)
Securities and other investments	(4,519)	(62)	(818)	74	10	(845)	(6,160)
Sale of investments	(214)	(19)	34	–	–	(1)	(200)
Goodwill and intangible assets	(773)	(263)	16	–	–	(118)	(1,138)
Other	255	20	(524)	27	(1)	224	1
Total	$ 2,101	$ (48)	$ 343	$ 104	$ 48	$ 284	$ 2,832

The total deferred tax assets as at December 31, 2016 of $4,439 (2015 – $4,067) include $4,403 (2015 – $4,025) 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, 2016, tax loss carryforwards available were approximately $3,556 (2015 – $4,963) of which $3,386 expire between the years 2017 and 2036 while $170 have no expiry date, and capital loss carryforwards available were approximately $69 (2015 – $8) and have no expiry date. A $942 (2015 – $1,493) tax benefit related to these tax loss carryforwards has been recognized as a deferred tax asset as at December 31, 2016, and a benefit of $139 (2015 – $66) has not been recognized. In addition, the Company has approximately $1,039 (2015 – $818) of tax credit carryforwards which will expire between the years 2017 and 2036 of which a benefit of $164 (2015 – $68) has not been recognized.

The total deferred tax liability as at December 31, 2016 was $1,359 (2015 – $1,235). 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 $6,958 (2015 – $5,902).

Note 7 Goodwill and Intangible Assets

(a) Carrying amounts of goodwill and intangible assets

As at December 31, 2016	Balance, January 1	Additions[3]/ Disposals[4]	Amortization expense	Effect of changes in foreign exchange rates	Balance, December 31
Goodwill	**$ 5,685**	**$ 256**	**$ n/a**	**$ (57)**	**$ 5,884**
Indefinite life intangible assets					
Brand	**831**	**–**	**n/a**	**(26)**	**805**
Fund management contracts and other[1]	**723**	**76**	**n/a**	**(14)**	**785**
	1,554	**76**	**n/a**	**(40)**	**1,590**
Finite life intangible assets[2]					
Distribution networks	**726**	**450**	**200**	**117**	**1,093**
Customer relationships	**947**	**79**	**53**	**(4)**	**969**
Software	**396**	**229**	**126**	**(5)**	**494**
Other	**76**	**6**	**5**	**–**	**77**
	2,145	**764**	**384**	**108**	**2,633**
Total intangible assets	**3,699**	**840**	**384**	**68**	**4,223**
Total goodwill and intangible assets	**$ 9,384**	**$1,096**	**$ 384**	**$ 11**	**$ 10,107**

As at December 31, 2015	Balance, January 1	Additions/ Disposals	Amortization expense	Effect of changes in foreign exchange rates	Balance, December 31
Goodwill	$ 3,181	$2,172	$ n/a	$ 332	$ 5,685
Indefinite life intangible assets					
Brand	696	–	n/a	135	831
Fund management contracts and other[1]	533	123	n/a	67	723
	1,229	123	n/a	202	1,554
Finite life intangible assets[2]					
Distribution networks	675	10	43	84	726
Customer relationships	36	945	50	16	947
Software	314	227	161	16	396
Other	26	50	3	3	76
	1,051	1,232	257	119	2,145
Total intangible assets	2,280	1,355	257	321	3,699
Total goodwill and intangible assets	$ 5,461	$3,527	$ 257	$ 653	$ 9,384

[1] For the fund management contracts, the significant CGUs to which these were allocated and their carrying values were John Hancock Investments and Retirement Plan Services with $393 (2015 – $405) and Canadian Wealth (excluding Manulife Bank of Canada) with $273 (2015 – $273).

[2] Gross carrying amount of finite life intangible assets was $1,363 for distribution networks, $1,142 for customer relationships, $1,581 for software and $133 for other (2015 – $999, $1,067, $1,563 and $127, respectively).

[3] Acquisitions of Standard Chartered's MPF business in Hong Kong and Transamerica's broker-dealer business in the USA led to additions of goodwill of $194 and $59 and intangible assets of $193 and $26, respectively. Commencement of sales through the DBS relationship led to recognition of $536 of distribution networks.

[4] Includes impairments of distribution networks for discontinued products of $150 in the U.S. Division.

(b) Impairment testing of goodwill

In the fourth quarter of 2016, 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 note 1(f) and 7(c)).

The Company has determined that there is no impairment of goodwill in 2016 and 2015.

The Company allocates goodwill to cash-generating units ("CGU") or groups of CGUs. Factors considered when identifying the Company's CGUs include how the Company is organized to interact with customers, how products are presented and sold, and where interdependencies exist. The carrying value of goodwill for all CGUs with goodwill balances is shown in the table below.

As at December 31, 2016 CGU or Group of CGUs	Balance, January 1	Additions/ disposals	Effect of changes in foreign exchange rates	Balance, December 31
Asia (excluding Hong Kong and Japan)	**$ 166**	**$ –**	**$ (6)**	**$ 160**
Hong Kong	**–**	**194**	**–**	**194**
Japan Insurance and Wealth	**404**	**–**	**(1)**	**403**
Canadian Individual Life	**155**	**–**	**–**	**155**
Canadian Affinity Markets	**83**	**–**	**–**	**83**
Canadian Wealth (excluding Manulife Bank)	**1,089**	**–**	**–**	**1,089**
Canadian Group Benefits and Group Retirement Solutions	**1,789**	**–**	**–**	**1,789**
International Group Program	**93**	**–**	**(3)**	**90**
John Hancock Insurance	**378**	**59**	**(9)**	**428**
John Hancock Investments and Retirement Plan Services	**1,234**	**3**	**(37)**	**1,200**
Corporate and Other	**294**	**–**	**(1)**	**293**
Total	**$ 5,685**	**$ 256**	**$ (57)**	**$ 5,884**

As at December 31, 2015 CGU or Group of CGUs	Balance, January 1	Additions/ disposals	Effect of changes in foreign exchange rates	Balance, December 31
Asia (excluding Hong Kong and Japan)	$ 143	$ –	$ 23	$ 166
Japan Insurance and Wealth	339	–	65	404
Canadian Individual Life	155	–	–	155
Canadian Affinity Markets	83	–	–	83
Canadian Wealth (excluding Manulife Bank)	750	339	–	1,089
Canadian Group Benefits and Group Retirement Solutions	826	963	–	1,789
International Group Program	78	–	15	93
John Hancock Insurance	317	–	61	378
John Hancock Investments and Retirement Plan Services	420	659	155	1,234
Corporate and Other	70	211	13	294
Total	$ 3,181	$ 2,172	$ 332	$ 5,685

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

(c) Valuation techniques

The recoverable value of each CGU or group of CGUs was based on value-in-use ("VIU") for the U.S. (John Hancock) based CGUs, the Canadian Individual Life CGU and the Japan Insurance and Wealth CGU. For all other CGUs, fair value less costs to sell ("FVLCS") 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 VIU approach, 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.

Under the FVLCS approach, the Company determines the fair value of the CGU or group of CGUs using an earnings-based approach which incorporated 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 10.3 to 13.8 (2015 – 9.5 to 12.9).

(d) Significant assumptions

To calculate the embedded value, the Company discounted projected earnings from in-force contracts and valued 10 years of new business growing at expected plan levels, consistent with the periods used for forecasting long-term businesses such as insurance. In arriving at its projections, the Company considered past experience, economic trends such as interest rates, equity returns and product mix as well as industry and market trends. Where growth rate assumptions for new business cash flows were used in the embedded value calculations, they ranged from negative five per cent to 15 per cent (2015 – zero 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 26.8 per cent, 35 per cent and 28.2 per cent (2015 – 26.8 per cent, 35 per cent and 28.9 per cent) for the Canadian, U.S. and Japan 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 nine per cent to 14 per cent on an after-tax basis or 11 per cent to 15 per cent on a pre-tax basis (2015 – nine per cent to 14 per cent on an after-tax basis or 11 per cent to 15 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 8 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 as well as 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,	2016	2015
Gross insurance contract liabilities	**$ 284,778**	$ 273,228
Gross benefits payable and provision for unreported claims	**3,309**	3,046
Gross policyholder amounts on deposit	**9,418**	9,014
Gross insurance contract liabilities	**297,505**	285,288
Reinsurance assets	**(34,952)**	(35,426)
Net insurance contract liabilities	**$ 262,553**	$ 249,862

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 line of business and reporting segment is as follows.

Gross insurance contract liabilities

As at December 31, 2016	Individual insurance Participating	Individual insurance Non-participating	Annuities and pensions	Other insurance contract liabilities[1]	Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
Asia division	**$ 29,520**	**$ 18,799**	**$ 3,599**	**$ 2,649**	**$ 54,567**	**$ 880**	**$ 55,447**
Canadian division	**10,974**	**31,790**	**19,620**	**11,000**	**73,384**	**593**	**73,977**
U.S. division	**9,419**	**56,484**	**28,529**	**40,760**	**135,192**	**33,220**	**168,412**
Corporate and Other	**–**	**(833)**	**62**	**181**	**(590)**	**259**	**(331)**
Total, net of reinsurance ceded	**49,913**	**106,240**	**51,810**	**54,590**	**262,553**	**$34,952**	**$297,505**
Total reinsurance ceded	**13,558**	**12,122**	**8,159**	**1,113**	**34,952**		
Total, gross of reinsurance ceded	**$ 63,471**	**$ 118,362**	**$ 59,969**	**$ 55,703**	**$ 297,505**		

As at December 31, 2015	Individual insurance Participating	Individual insurance Non-participating	Annuities and pensions	Other insurance contract liabilities[1]	Total, net of reinsurance ceded	Total reinsurance ceded	Total, gross of reinsurance ceded
Asia division	$ 27,808	$ 12,518	$ 3,353	$ 2,307	$ 45,986	$ 866	$ 46,852
Canadian division	10,389	29,283	21,253	10,548	71,473	263	71,736
U.S. division	9,743	53,637	30,080	39,446	132,906	33,993	166,899
Corporate and Other	–	(795)	74	218	(503)	304	(199)
Total, net of reinsurance ceded	47,940	94,643	54,760	52,519	249,862	$35,426	$285,288
Total reinsurance ceded	15,125	10,963	8,226	1,112	35,426		
Total, gross of reinsurance ceded	$ 63,065	$ 105,606	$ 62,986	$ 53,631	$ 285,288		

[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 Life Insurance Company. These sub-accounts permit this participating business to be operated as separate "closed blocks" of participating policies. As at December 31, 2016, assets and insurance contract liabilities related to these closed blocks of participating policies were $29,108 (2015 – $29,588).

(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 take into account 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 value of actuarial liabilities. The fair value of assets backing net insurance contract liabilities as at December 31, 2016, excluding reinsurance assets, was estimated at $266,119 (2015 – $252,961).

The fair value of assets backing capital and other liabilities as at December 31, 2016 was estimated at $459,256 (2015 – $453,887).

The carrying value of total assets backing net insurance contract liabilities, other liabilities and capital was as follows.

As at December 31, 2016	Individual insurance Participating	Individual insurance Non-participating	Annuities and pensions	Other insurance contract liabilities[1]	Other liabilities[2]	Capital[3]	Total
Assets							
Debt securities	**$ 27,473**	**$ 56,765**	**$ 26,331**	**$ 23,012**	**$ 9,965**	**$ 25,076**	**$ 168,622**
Public equities	**8,055**	**5,401**	**213**	**351**	**732**	**4,744**	**19,496**
Mortgages	**2,110**	**10,008**	**8,135**	**5,554**	**18,311**	**75**	**44,193**
Private placements	**3,277**	**10,823**	**7,096**	**7,070**	**1,272**	**191**	**29,729**
Real estate	**2,811**	**6,397**	**1,480**	**2,561**	**613**	**270**	**14,132**
Other	**6,187**	**16,846**	**8,555**	**16,042**	**377,000**	**19,879**	**444,509**
Total	**$ 49,913**	**$ 106,240**	**$ 51,810**	**$ 54,590**	**$ 407,893**	**$ 50,235**	**$ 720,681**

As at December 31, 2015	Individual insurance Participating	Individual insurance Non-participating	Annuities and pensions	Other insurance contract liabilities[1]	Other liabilities[2]	Capital[3]	Total
Assets							
Debt securities	$ 26,180	$ 49,111	$ 28,180	$ 23,988	$ 8,766	$ 21,602	$ 157,827
Public equities	7,454	3,897	794	366	769	3,703	16,983
Mortgages	2,219	9,209	8,166	5,600	18,530	94	43,818
Private placements	3,253	10,816	6,322	5,758	1,210	219	27,578
Real estate	3,022	6,068	1,917	2,361	693	1,286	15,347
Other	5,812	15,542	9,381	14,446	373,144	22,993	441,318
Total	$ 47,940	$ 94,643	$ 54,760	$ 52,519	$ 403,112	$ 49,897	$ 702,871

[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, non-exempt embedded derivatives and other miscellaneous liabilities.
[3] Capital is defined in note 14.

(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 2016 experience was unfavourable (2015 – unfavourable) when compared to the Company's assumptions. Morbidity is also monitored monthly and the overall 2016 experience was unfavourable (2015 – 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 2016, the movement in interest rates negatively (2015 – positively) impacted the Company's net income. This negative impact was driven by reductions in corporate spreads and the impact of risk free interest rate movements on policy liabilities partially offset by reductions in swap spreads. 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 2016, credit loss experience on debt securities and mortgages was favourable (2015 – 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 2016, investment experience on alternative long-duration assets backing policyholder liabilities was unfavourable (2015 – unfavourable) primarily due to losses on real estate, oil and gas properties and timber and agriculture properties, partially offset by gains on private equities. In 2016, alternative long-duration asset origination exceeded (2015 – exceeded) valuation requirements. In 2016, for the business that is dynamically hedged, segregated fund guarantee experience on residual, non-dynamically hedged market risks was unfavourable (2015 – unfavourable). 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 (2015 – unfavourable). This excludes the experience on the macro equity hedges. In 2016, investment expense experience was favourable (2015 – favourable) when compared to the Company's assumptions.

Nature of factor and assumption methodology		Risk management
Policyholder behaviour	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 other policyholder behaviour risk. The Company monitors lapse, surrender and other policyholder behaviour experience. In aggregate, 2016 policyholder behaviour experience was unfavourable (2015 – unfavourable) when compared to the Company's assumptions used in the computation of actuarial liabilities.
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 2016 were unfavourable (2015 – 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's practice is to review actuarial assumptions on an annual basis as part of its review of methods and assumptions. Where changes are made to assumptions (refer to note 8(h)), the full impact is recognized in income immediately.

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

The sensitivity of net income attributed to shareholders to changes in non-economic assumptions underlying policy liabilities is shown below, assuming that there is a simultaneous change in the assumption across all business units.

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

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

As at December 31,	Decrease in net income attributable to shareholders 2016	2015
Policy related assumptions		
2% adverse change in future mortality rates[2],[4]		
Products where an increase in rates increases insurance contract liabilities	**$ (400)**	$ (400)
Products where a decrease in rates increases insurance contract liabilities	**(500)**	(500)
5% adverse change in future morbidity rates[3],[4]	**(3,700)**	(3,000)
10% adverse change in future termination rates[4]	**(1,900)**	(2,000)
5% increase in future expense levels	**(500)**	(400)

[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 long-term care for morbidity, mortality and lapse are assumed to be moderated by partial offsets from the Company's ability to contractually raise premium rates in such events, subject to state regulatory approval.

(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 mis-estimation 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 taking into account 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, 2016	Net actuarial liabilities	Other insurance contract liabilities [1]	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
Balance, January 1	**$ 239,812**	**$ 10,050**	**$ 249,862**	**$ 35,426**	**$ 285,288**
New policies[2]	**3,617**	**–**	**3,617**	**294**	**3,911**
Normal in-force movement[2]	**12,579**	**1,094**	**13,673**	**(405)**	**13,268**
Changes in methods and assumptions[2]	**709**	**(54)**	**655**	**699**	**1,354**
Impact of changes in foreign exchange rates	**(4,979)**	**(275)**	**(5,254)**	**(1,062)**	**(6,316)**
Balance, December 31	**$ 251,738**	**$ 10,815**	**$ 262,553**	**$ 34,952**	**$ 297,505**

For the year ended December 31, 2015	Net actuarial liabilities	Other insurance contract liabilities [1]	Net insurance contract liabilities	Reinsurance assets	Gross insurance contract liabilities
Balance, January 1	$ 200,206	$ 9,264	$ 209,470	$ 18,525	$ 227,995
Acquisitions and divestitures[3]	3,897	(861)	3,036	13,691	16,727
New policies[4]	2,205	–	2,205	196	2,401
Normal in-force movement[4]	5,505	231	5,736	(485)	5,251
Changes in methods and assumptions[4]	582	(24)	558	(380)	178
Impact of changes in foreign exchange rates	27,417	1,440	28,857	3,879	32,736
Balance, December 31	$ 239,812	$ 10,050	$ 249,862	$ 35,426	$ 285,288

[1] Other insurance contract liabilities are comprised of benefits payable and provision for unreported claims and policyholder amounts on deposit.

[2] In 2016 the $18,014 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 column of this table net to an increase of $18,533, of which $17,529 is included in the Consolidated Statements of Income increase in insurance contract liabilities and $1,004 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.

[3] In 2015 the Company acquired the Canadian-based operations of Standard Life and in the USA, NYL assumed 60% of the Company's in-force participating life insurance closed block through net 60% reinsurance agreements.

[4] In 2015 the $7,452 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 column of this table net to an increase of $7,830, of which $7,408 is included in the Consolidated Statements of Income increase in insurance contract liabilities, $439 is included in gross claims and benefits and $(17) is related to Life Retrocession insurance contract liabilities sold through a reinsurance agreement in 2011 and is offset in the change in reinsurance assets. The Consolidated Statements of Income change in insurance contract liabilities also includes the change in embedded derivatives associated with insurance contracts.

(h) Actuarial methods and assumptions

A comprehensive review of valuation assumptions and methods 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 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 2016

The 2016 full year review of actuarial methods and assumptions resulted in an increase in insurance and investment contract liabilities of $655, net of reinsurance, and a decrease in net income attributed to shareholders of $453 post-tax.

For the year ended December 31, 2016	Change in gross insurance and investment contract liabilities	Change in net insurance and investment contract liabilities	Change in net income attributed to shareholders (post-tax)
JH Long Term Care triennial review	**$ 696**	**$ 696**	**$ (452)**
Mortality and morbidity updates	**(12)**	**(53)**	**76**
Lapses and policyholder behaviour			
U.S. Variable Annuities guaranteed minimum withdrawal benefit incidence and utilization	**(1,024)**	**(1,024)**	**665**
Other lapses and policyholder behaviour	**516**	**431**	**(356)**
Economic reinvestment assumptions	**459**	**443**	**(313)**
Other updates	**719**	**162**	**(73)**
Net impact	**$ 1,354**	**$ 655**	**$ (453)**

JH Long Term Care triennial review

U.S. Insurance completed a comprehensive long-term care experience study in 2016. This included a review of mortality, morbidity and lapse experience, as well as the reserve for in-force rate increases filed as a result of the 2013 review. In addition, the Company implemented refinements to the modelling of future tax cash flows for long-term care. The net impact of the review was a $452 charge to net income attributed to shareholders.

Expected future claims costs increased primarily due to claims periods being longer than expected in policy liabilities, and a reduction in lapse and mortality rates. This increase in expected future claims costs was partially offset by a number of items, including expected future premium increases resulting from this year's review and a decrease in the margin for adverse deviations related to the rate of inflation embedded in the Company's benefit utilization assumptions.

The review of premium increases assumed in the insurance contract liabilities resulted in a benefit to earnings of $1.0 billion; this includes future premium increases that are due to the 2016 review of morbidity, mortality and lapse assumptions, and outstanding amounts from the Company's 2013 state filings. Premium increases averaging approximately 20 per cent will be sought on the vast majority of the in-force business, excluding the carryover of 2013 amounts requested. The Company's assumptions reflect the estimated timing and amount of state approved premium increases. The actual experience obtaining price increases could be materially different than the Company has assumed, resulting in further increases or decreases in policy liabilities which could be material.

Mortality and morbidity updates

Mortality and morbidity assumptions were updated across several business units to reflect recent experience, including updates to morbidity assumptions for certain medical insurance products in Japan, leading to a $76 benefit to net income attributed to shareholders.

Updates to lapses and policyholder behaviour

U.S. Variable Annuities guaranteed minimum withdrawal benefit incidence and utilization assumptions were updated to reflect recent experience which led to a $665 benefit to net income attributed to shareholders. The Company updated its incidence assumptions to reflect the favourable impact of policyholders taking withdrawals later than expected. This was partially offset by an increase in the Company's utilization assumptions.

In Japan, lapse rates for term life insurance products were increased at certain durations which led to a $228 charge to net income attributed to shareholders. Other updates to lapse and policyholder behavior assumptions were made across several product lines, including term products in Canada, which led to a $128 charge to net income attributed to shareholders.

Updates to economic reinvestment assumptions

The Company updated economic reinvestment assumptions for risk free rates used in the valuation of policy liabilities which resulted in a $313 charge to net income attributed to shareholders. These updates included a ten basis point reduction in the Company's ultimate reinvestment rate ("URR") assumptions and a commensurate change in the calibration criteria for stochastic risk free rates. These updates reflect the fact that interest rates are lower than they were when the current prescribed URR and calibration criteria for stochastic risk free rates were promulgated by the Actuarial Standards Board ("ASB") in 2014. The ASB has indicated that it will update the promulgation periodically, when necessary. The Company expects the promulgation to be updated in 2017 and, if required, it will make further updates to its economic reinvestment assumptions at that time.

Other updates

Other model refinements related to the projection of both asset and liability cash flows across several business units led to a $73 charge to net income attributed to shareholders. This included a charge due to refinements to the Company's CALM models and assumptions offset by a benefit due to refinements to the modelling of future tax cash flows for certain assets in the U.S.

2015 review

In 2015, the completion of the annual review of actuarial methods and assumptions resulted in an increase in insurance and investment contract liabilities of $558 net of reinsurance and a decrease in net income attributed to shareholders of $451.

For the year ended December 31, 2015	Change in gross insurance and investment contract liabilities	Change in net insurance and investment contract liabilities	Change in net income attributed to shareholders (post-tax)
Mortality and morbidity updates	$ (191)	$ (146)	$ 168
Lapses and policyholder behaviour	953	571	(446)
Other updates	(584)	133	(173)
Net impact	$ 178	$ 558	$ (451)

Updates to mortality and morbidity

Assumptions were updated across several business units to reflect recent experience. In Japan, a reduction to the margin for adverse deviations applied to the best estimate morbidity assumptions for certain medical insurance products resulted in a $237 increase in net income attributed to shareholders. The reduction in this margin is a result of emerging experience being aligned with expectations leading to a decrease in the level of conservatism required for this assumption.

Other mortality and morbidity updates led to a $69 decrease in net income attributed to shareholders. This included a refinement to the modelling of mortality improvement on a portion of the Canadian retail insurance business that led to an increase in net income attributed to shareholders. This was more than offset by a review of the Company mortality assumption for some of the JH Annuities business and a number of other updates across several business units.

Updates to lapses and policyholder behaviour

Lapse rates were updated across several business units to reflect recent experience. Lapse rates for JH universal life and variable universal life products were updated which led to a net $235 decrease in net income attributed to shareholders. Lapse rates for low cost universal life products were reduced which led to a decrease in net income attributed to shareholders; this was partially offset by a reduction in lapse rates for the variable universal life products which led to an increase in net income attributed to shareholders.

Other updates to lapse and policyholder behaviour assumptions were made across several product lines including term and whole life insurance products in Japan, which led to a $211 decrease in net income attributed to shareholders.

Other updates

The Company implemented a refinement to the modelling of asset and liability cash flows associated with inflation linked benefit options in the Long Term Care business, which led to a $264 increase in net income attributed to shareholders.

The Company implemented a refinement to the projection of the term policy conversion options in Canadian retail insurance which led to a $200 decrease in net income attributed to shareholders.

Other model refinements related to the projection of both asset and liability cash flows across several business units led to a $237 decrease in net income attributed to shareholders. This included several items such as refinements to the modelling of reinsurance contracts in North America, updates to the future investment expense assumptions, updates to the future ALDA investment return assumptions and updates to certain future expense assumptions in JH Insurance.

(i) Insurance contracts contractual obligations

Insurance contracts give rise to obligations fixed by agreement. As at December 31, 2016, 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]	**$ 9,913**	**$ 13,490**	**$ 18,071**	**$ 687,753**	**$ 729,227**

[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,	2016	2015
Death, disability and other claims	**$ 13,820**	$ 13,130
Maturity and surrender benefits	**6,697**	6,195
Annuity payments	**4,310**	4,211
Policyholder dividends and experience rating refunds	**1,111**	1,106
Net transfers from segregated funds	**(879)**	(881)
Total	**$ 25,059**	$ 23,761

Note 9 Investment Contract Liabilities

Investment contract liabilities are contractual obligations made by the Company that do not contain significant insurance risk and 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 comprise certain investment savings and pension products sold primarily in Hong Kong and China. The carrying value of investment contract liabilities measured at fair value as at December 31, 2016 was $631 (2015 – $785).

The change in investment contract liabilities measured at fair value was a result of the following.

For the years ended December 31,	2016	2015
Balance, January 1	$ 785	$ 680
New policies	53	52
Changes in market conditions	(103)	90
Redemptions, surrenders and maturities	(83)	(166)
Impact of changes in foreign exchange rates	(21)	129
Balance, December 31	$ 631	$ 785

(b) Investment contract liabilities measured at amortized cost

Investment contract liabilities measured at amortized cost comprise several fixed annuity products sold in Canada and the U.S. fixed annuity products considered investment contracts are those that provide guaranteed income payments for a contractually determined period of time and are not contingent on survivorship.

Investment contract liabilities measured at amortized cost are shown below. The fair value associated with these contracts is also shown for comparative purposes.

	2016		2015	
As at December 31,	Amortized cost	Fair value	Amortized cost	Fair value
U.S. fixed annuity products	$ 1,412	$ 1,516	$ 1,488	$ 1,542
Canadian fixed annuity products	1,232	1,389	1,224	1,290
Investment contract liabilities	$ 2,644	$ 2,905	$ 2,712	$ 2,832

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

For the years ended December 31,	2016	2015
Balance, January 1	$ 2,712	$ 1,964
Acquisitions and divestitures[1]	–	943
New policy deposits	112	64
Interest	100	121
Withdrawals	(235)	(520)
Fees	(1)	(1)
Other	1	(127)
Impact of changes in foreign exchange rates	(45)	268
Balance, December 31	$ 2,644	$ 2,712

[1] In 2015 the Company acquired the Canadian-based operations of Standard Life.

The 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.

The 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. All investment contracts were categorized in Level 2 of the fair value hierarchy (2015 – Level 2).

(c) Investment contracts contractual obligations

Investment contracts give rise to obligations fixed by agreement. As at December 31, 2016, the Company's contractual obligations and commitments relating to 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]	$ 301	$ 558	$ 519	$ 4,197	$ 5,575

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

Note 10 Risk Management

The Company's policies and procedures for managing risk related to financial instruments can be found in the "Risk Management" section of the Company's MD&A for the year ended December 31, 2016. Specifically, these disclosures are included in "Market Risk" and "Liquidity Risk" in this section. These disclosures are in accordance with IFRS 7 "Financial Instruments: Disclosures" and therefore, only the shaded text and tables form an integral part of these Consolidated Financial Statements.

(a) 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. Worsening regional and global economic conditions 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 and an increase in provisions for future credit impairments to be 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 10(d) and credit risk associated with reinsurance counterparties is discussed in note 10(i).

Credit exposure

The following table outlines the gross carrying amount of financial instruments subject to credit exposure, without taking into account any collateral held or other credit enhancements.

As at December 31,	2016	2015
Debt securities		
FVTPL	**$ 140,890**	$ 133,890
AFS	**27,732**	23,937
Mortgages	**44,193**	43,818
Private placements	**29,729**	27,578
Policy loans	**6,041**	5,912
Loans to Bank clients	**1,745**	1,778
Derivative assets	**23,672**	24,272
Accrued investment income	**2,260**	2,264
Reinsurance assets	**34,952**	35,426
Other financial assets	**4,844**	4,044
Total	**$ 316,058**	$ 302,919

Credit quality

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

The following table summarizes the credit quality and carrying value of commercial mortgages and private placements.

As at December 31, 2016	AAA	AA	A	BBB	BB	B and lower	Total
Commercial mortgages							
Retail	**$ 97**	**$ 1,620**	**$ 4,391**	**$ 2,085**	**$ –**	**$ 7**	**$ 8,200**
Office	**68**	**1,255**	**3,972**	**1,938**	**55**	**36**	**7,324**
Multi-family residential	**656**	**1,362**	**1,944**	**844**	**–**	**–**	**4,806**
Industrial	**22**	**360**	**1,452**	**831**	**169**	**–**	**2,834**
Other	**428**	**261**	**1,323**	**493**	**60**	**–**	**2,565**
Total commercial mortgages	**1,271**	**4,858**	**13,082**	**6,191**	**284**	**43**	**25,729**
Agricultural mortgages	**–**	**151**	**61**	**469**	**141**	**–**	**822**
Private placements	**1,086**	**4,466**	**10,672**	**11,605**	**936**	**964**	**29,729**
Total	**$ 2,357**	**$ 9,475**	**$ 23,815**	**$ 18,265**	**$ 1,361**	**$ 1,007**	**$ 56,280**

As at December 31, 2015	AAA	AA	A	BBB	BB	B and lower	Total
Commercial mortgages							
Retail	$ 109	$ 1,307	$ 4,419	$ 2,135	$ 10	$ 5	$ 7,985
Office	112	944	3,301	2,444	286	50	7,137
Multi-family residential	862	1,227	1,630	905	–	–	4,624
Industrial	30	303	1,213	1,262	23	–	2,831
Other	487	270	1,083	870	70	–	2,780
Total commercial mortgages	1,600	4,051	11,646	7,616	389	55	25,357
Agricultural mortgages	–	–	230	540	168	–	938
Private placements	1,030	3,886	9,813	10,791	1,113	945	27,578
Total	$ 2,630	$ 7,937	$ 21,689	$ 18,947	$ 1,670	$ 1,000	$ 53,873

The 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 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.

The following table summarizes the carrying value of residential mortgages and loans to Bank clients.

	2016			2015		
As at December 31,	Insured	Uninsured	Total	Insured	Uninsured	Total
Residential mortgages						
Performing	**$ 7,574**	**$ 10,050**	**$ 17,624**	$ 8,027	$ 9,478	$ 17,505
Non-performing[1]	**6**	**13**	**19**	7	11	18
Loans to Bank clients						
Performing	**n/a**	**1,743**	**1,743**	n/a	1,778	1,778
Non-performing[1]	**n/a**	**2**	**2**	n/a	–	–
Total	**$ 7,580**	**$ 11,808**	**$ 19,388**	$ 8,034	$ 11,267	$ 19,301

[1] Non-performing refers to assets that are 90 days or more past due if uninsured and 365 days or more if insured.

The carrying value of government-insured mortgages was 19 per cent of the total mortgage portfolio as at December 31, 2016 (2015 – 20 per cent). The majority 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.

The following table summarizes the carrying value or impaired value, in the case of impaired debt securities, of the Company's financial assets that are considered past due or impaired.

	Past due but not impaired			
As at December 31, 2016	Less than 90 days	90 days and greater	Total	Total impaired
Debt securities				
FVTPL	**$ 90**	**$ –**	**$ 90**	**$ 38**
AFS	**16**	**9**	**25**	**–**
Private placements	**215**	**64**	**279**	**152**
Mortgages and loans to Bank clients	**50**	**20**	**70**	**33**
Other financial assets	**57**	**54**	**111**	**8**
Total	**$ 428**	**$ 147**	**$ 575**	**$ 231**

	Past due but not impaired			
As at December 31, 2015	Less than 90 days	90 days and greater	Total	Total impaired
Debt securities				
FVTPL	$ 92	$ –	$ 92	$ 15
AFS	3	1	4	–
Private placements	214	–	214	114
Mortgages and loans to Bank clients	51	23	74	31
Other financial assets	12	26	38	1
Total	$ 372	$ 50	$ 422	$ 161

The following table summarizes the Company's loans that are considered impaired.

As at December 31, 2016	Gross carrying value	Allowances for losses	Net carrying value
Private placements	**$ 244**	**$ 92**	**$ 152**
Mortgages and loans to Bank clients	**59**	**26**	**33**
Total	**$ 303**	**$ 118**	**$ 185**

As at December 31, 2015	Gross carrying value	Allowances for losses	Net carrying value
Private placements	$ 186	$ 72	$ 114
Mortgages and loans to Bank clients	60	29	31
Total	$ 246	$ 101	$ 145

Allowance for loan losses

For the years ended December 31,	2016 Private placements	2016 Mortgages and loans to Bank clients	2016 Total	2015 Private placements	2015 Mortgages and loans to Bank clients	2015 Total
Balance, January 1	**$ 72**	**$ 29**	**$ 101**	$ 72	$ 37	$ 109
Provisions	**112**	**14**	**126**	46	5	51
Recoveries	**(62)**	**(7)**	**(69)**	(9)	(4)	(13)
Write-offs[1]	**(30)**	**(10)**	**(40)**	(37)	(9)	(46)
Balance, December 31	**$ 92**	**$ 26**	**$ 118**	$ 72	$ 29	$ 101

[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, which exceeds 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 on a daily basis with additional collateral obtained or refunded as the market value of the underlying loaned securities fluctuates. As at December 31, 2016, the Company had loaned securities (which are included in invested assets) with a market value of $1,956 (2015 – $648). 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 and to take possession of securities to cover short positions in similar instruments and undertakes repurchase transactions for short-term funding purposes. As at December 31, 2016, the Company had engaged in reverse repurchase transactions of $250 (2015 – $547) which are recorded as short-term receivables. In addition, the Company had engaged in repurchase transactions of $255 as at December 31, 2016 (2015 – $269) 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") in order to complement its cash debt securities investing. The Company will not write CDS protection in excess of 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 provides 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, 2016	Notional amount[2]	Fair value	Weighted average maturity (in years)[3]
Single name CDSs[1]			
Corporate debt			
AAA	**$ 13**	**$ –**	**2**
AA	**37**	**1**	**3**
A	**457**	**13**	**4**
BBB	**155**	**4**	**3**
Total single name CDSs	**$ 662**	**$ 18**	**4**
Total CDS protection sold	**$ 662**	**$ 18**	**4**

As at December 31, 2015	Notional amount[2]	Fair value	Weighted average maturity (in years)[3]
Single name CDSs[1]			
Corporate debt			
AAA	$ 49	$ 1	2
AA	131	1	1
A	424	7	3
BBB	144	1	4
Total single name CDSs	$ 748	$ 10	3
Total CDS protection sold	$ 748	$ 10	3

[1] The 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, then an internally developed rating is used.
[2] 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.
[3] The weighted average maturity of the CDS is weighted based on notional amounts.

The Company holds no purchased credit protection as at December 31, 2016 and 2015.

(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 particular 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 seeks to limit 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, 2016, the percentage of the Company's derivative exposure which was with counterparties rated AA- or higher amounted to 22 per cent (2015 – 21 per cent). The Company's exposure to credit risk was mitigated by $12,781 fair value of collateral held as security as at December 31, 2016 (2015 – $12,940).

As at December 31, 2016, the largest single counterparty exposure, without taking into account the impact of master netting agreements or the benefit of collateral held, was $3,891 (2015 – $4,155). The net exposure to this counterparty, after taking into account master netting agreements and the fair value of collateral held, was nil (2015 – nil). As at December 31, 2016, 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 $24,603 (2015 – $25,332).

(e) Offsetting financial assets and financial liabilities

Certain derivatives, securities lending 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 assets the Company holds as collateral to offset against obligations to the same counterparty.

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

		Related amounts not set off in the Consolidated Statements of Financial Position			
As at December 31, 2016	Gross amounts of financial instruments presented in the Consolidated Statements of Financial Position[1]	Amounts subject to an enforceable master netting arrangement or similar agreements	Financial and cash collateral pledged (received)[2]	Net amount including financing trusts[3]	Net amounts excluding financing trusts
Financial assets					
Derivative assets	**$ 24,603**	**$ (12,031)**	**$ (12,382)**	**$ 190**	**$ 189**
Securities lending	**1,956**	**–**	**(1,956)**	**–**	**–**
Reverse repurchase agreements	**250**	**–**	**(250)**	**–**	**–**
Total financial assets	**$ 26,809**	**$ (12,031)**	**$ (14,588)**	**$ 190**	**$ 189**
Financial liabilities					
Derivative liabilities	**$ (15,095)**	**$ 12,031**	**$ 2,800**	**$ (264)**	**$ (42)**
Repurchase agreements	**(255)**	**–**	**255**	**–**	**–**
Total financial liabilities	**$ (15,350)**	**$ 12,031**	**$ 3,055**	**$ (264)**	**$ (42)**

		Related amounts not set off in the Consolidated Statements of Financial Position			
As at December 31, 2015	Gross amounts of financial instruments presented in the Consolidated Statements of Financial Position[1]	Amounts subject to an enforceable master netting arrangement or similar agreements	Financial and cash collateral pledged (received)[2]	Net amount including financing trusts[3]	Net amounts excluding financing trusts
Financial assets					
Derivative assets	$ 25,332	$ (13,004)	$ (12,260)	$ 68	$ 68
Securities lending	648	–	(648)	–	–
Reverse repurchase agreements	547	(33)	(514)	–	–
Total financial assets	$ 26,527	$ (13,037)	$ (13,422)	$ 68	$ 68
Financial liabilities					
Derivative liabilities	$ (16,003)	$ 13,004	$ 2,711	$ (288)	$ (49)
Repurchase agreements	(269)	33	236	–	–
Total financial liabilities	$ (16,272)	$ 13,037	$ 2,947	$ (288)	$ (49)

[1] Financial assets and liabilities in the above table include accrued interest of $935 and $944, respectively (2015 – $1,062 and $953, respectively).

[2] Financial and cash collateral excludes over-collateralization. As at December 31, 2016, 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 $398, $494, $107 and $1, respectively (2015 – $680, $498, $43 and nil, respectively). As at December 31, 2016, collateral pledged (received) does not include collateral in transit on OTC instruments or include initial margin on exchange traded contracts or cleared contracts.

[3] The net amount includes derivative contracts entered into between the Company and its financing trusts which it does not consolidate. The Company does not exchange collateral on derivative contracts entered into with these trusts.

(f) Risk concentrations

The Company establishes enterprise-wide investment portfolio level targets and limits with the objective of ensuring 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 such findings to the Executive Risk Committee and the Risk Committee of the Board of Directors.

As at December 31,	2016	2015
Debt securities and private placements rated as investment grade BBB or higher[1]	97%	97%
Government debt securities as a per cent of total debt securities	43%	44%
Government private placements as a per cent of total private placements	10%	11%
Highest exposure to a single non-government debt security and private placement issuer	$ 1,010	$ 998
Largest single issuer as a per cent of the total equity portfolio	3%	2%
Income producing commercial office properties (2016 – 65% of real estate, 2015 – 70%)	$ 9,200	$ 10,803
Largest concentration of mortgages and real estate [2] – Ontario Canada (2016 – 24%, 2015 – 24%)	$ 13,882	$ 14,209

[1] Investment grade debt securities and private placements include 41% rated A, 14% rated AA and 21% rated AAA (2015 – 40%, 14% and 23%) investments based on external ratings where available.

[2] Mortgages and real estate are diversified geographically and by property type.

The following table shows the distribution of the debt securities and private placements portfolio by sector and industry.

Debt securities and private placements

	2016		2015	
As at December 31,	Carrying value	% of total	Carrying value	% of total
Government and agency	$ 76,020	38	$ 72,432	39
Utilities	37,561	19	34,890	19
Financial	25,027	13	24,518	13
Energy	15,775	8	13,422	7
Industrial	13,088	6	11,454	6
Consumer (non-cyclical)	12,440	6	10,832	6
Consumer (cyclical)	4,256	2	4,425	2
Securitized	3,514	2	3,215	2
Basic materials	3,387	2	3,338	2
Telecommunications	3,091	2	3,059	2
Technology	2,231	1	1,931	1
Media and internet	1,175	1	1,233	1
Diversified and miscellaneous	786	–	656	–
Total	$ 198,351	100	$ 185,405	100

(g) Insurance risk

Insurance risk is the risk of loss due to actual experience differing from the experience assumed when a product was designed and priced with respect to mortality and morbidity claims, policyholder behaviour and expenses. A variety of assumptions are made related to the future level of claims, policyholder behaviour, expenses and sales levels when products are designed and priced as well as in the determination of insurance contract liabilities. Assumptions for future claims are generally based on the Company and industry experience and assumptions for policyholder behaviours are generally based on the Company experience. Such assumptions require a significant amount of professional judgment and, therefore, actual experience may be materially different than the assumptions made by the Company. Claims may be impacted by the unusual onset of disease or illness, natural disasters, large-scale man-made disasters and acts of terrorism. Policyholder premium payment patterns, policy renewal, withdrawal and surrender activity is influenced by many factors including market and general economic conditions, and the availability and price of other products in the marketplace.

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 life underwriting manual. Each business unit has underwriting procedures, including criteria for approval of risks and claims adjudication procedures. The Company has a global retention limit of US$30 and US$35, respectively, for individual and survivorship life insurance. Lower limits are applied in some markets and jurisdictions. The Company further reduces exposure to claims concentrations by applying geographical aggregate retention limits for certain covers.

(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, 2016	Gross liabilities	Reinsurance assets	Net liabilities
U.S. and Canada	**$ 238,796**	**$ (34,987)**	**$ 203,809**
Asia and Other	**62,322**	**35**	**62,357**
Total	**$ 301,118**	**$ (34,952)**	**$ 266,166**

As at December 31, 2015	Gross liabilities	Reinsurance assets	Net liabilities
U.S. and Canada	$ 236,106	$ (35,408)	$ 200,698
Asia and Other	52,976	(18)	52,958
Total	$ 289,082	$ (35,426)	$ 253,656

(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. In order 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, 2016, the Company had $34,952 (2015 – $35,426) of reinsurance assets. Of this, 92 per cent (2015 – 93 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 $16,600 fair value of collateral held as security as at December 31, 2016 (2015 – $16,721). Net exposure after taking into account offsetting agreements and the benefit of the fair value of collateral held was $18,352 as at December 31, 2016 (2015 – $18,705).

Note 11 Long-Term Debt

(a) Carrying value of long term debt instruments

As at December 31,	Issue date	Maturity date	Par value	2016	2015
4.70% Senior notes[1],[3]	June 23, 2016	June 23, 2046	US$ 1,000	**$ 1,333**	$ –
5.375% Senior notes[2],[3]	March 4, 2016	March 4, 2046	US$ 750	**994**	–
3.527% Senior notes[2],[3]	December 2, 2016	December 2, 2026	US$ 270	**361**	–
4.150% Senior notes[2],[3]	March 4, 2016	March 4, 2026	US$ 1,000	**1,333**	–
4.90% Senior notes[3],[4]	September 17, 2010	September 17, 2020	US$ 500	**669**	689
7.768% Medium term notes[5]	April 8, 2009	April 8, 2019	$ 600	**599**	599
5.505% Medium term notes[5]	June 26, 2008	June 26, 2018	$ 400	**400**	399
Promissory note to Manulife Finance (Delaware), L.P. ("MFLP")[6]	November 30, 2010	December 15, 2016	$ 150	**–**	150
Other notes payable	n/a	n/a	n/a	**7**	16
Total				**$ 5,696**	$ 1,853

(1) Issued by MFC during the year, interest is payable semi-annually. The notes may be redeemed in whole, but not in part, at the option of MFC, on June 23, 2021 and thereafter on every June 23, at a redemption price equal to 100% of the principal amount, together with accrued and unpaid interest.

(2) Issued by MFC during the year. The senior notes may be redeemed in whole or in part, at the option of MFC 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 numbers of basis points for the 5.375%, 4.150% and 3.527% senior notes are 40, 35 and 20, respectively.

(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) The senior notes may be redeemed in whole or in part, at the option of MFC 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 35 basis points.

(5) The medium term notes may be redeemed in whole or in part, at the option of MFC at any time, at a redemption price equal to the greater of par and a price based on the yield of a corresponding Government of Canada bond plus a specified number of basis points. The numbers of basis points for the 7.768% and 5.505% medium term notes are 125 and 39, respectively.

(6) On December 15, 2016, the promissory note to MFLP matured.

The cash amount of interest paid on long-term debt during the year ended December 31, 2016 was $191 (2015 – $183). 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. Fair value of long-term debt as at December 31, 2016 was $6,100 (2015 – $2,066). Long-term debt was categorized in Level 2 of the fair value hierarchy (2015 – Level 2).

(c) Aggregate maturities of long-term debt

As at December 31,	2016	2015
Less than one year	$ 7	$ 150
One to two years	400	15
Two to three years	599	400
Three to four years	669	599
Four to five years	–	689
Greater than five years	4,021	–
Total	**$ 5,696**	$ 1,853

Note 12 Capital Instruments

(a) Carrying value of capital instruments

As at December 31,	Issuance date	Maturity date	Par value	2016	2015
Senior debenture notes – 7.535% fixed/floating[1]	July 10, 2009	December 31, 2108	$ 1,000	$ 1,000	$ 1,000
Subordinated note – floating[2]	December 14, 2006	December 15, 2036	$ 650	647	646
Subordinated debentures – 3.181% fixed/floating[3]	November 20, 2015	November 22, 2027	$ 1,000	996	995
Subordinated debentures – 3.85% fixed/fixed reset[4]	May 25, 2016	May 25, 2026	S$ 500	461	–
Subordinated debentures – 2.389% fixed/floating[5]	June 1, 2015	January 5, 2026	$ 350	349	348
Subordinated debentures – 2.10% fixed/floating[6]	March 10, 2015	June 1, 2025	$ 750	747	747
Subordinated debentures – 2.64% fixed/floating[7]	December 1, 2014	January 15, 2025	$ 500	499	498
Subordinated debentures – 2.811% fixed/floating[8]	February 21, 2014	February 21, 2024	$ 500	499	498
Surplus notes – 7.375% U.S. dollar[9]	February 25, 1994	February 15, 2024	US$ 450	627	649
Subordinated debentures – 2.926% fixed/floating[10]	November 29, 2013	November 29, 2023	$ 250	249	249
Subordinated debentures – 2.819% fixed/floating[11]	February 25, 2013	February 26, 2023	$ 200	200	200
Subordinated debentures – 3.938% fixed/floating[12]	September 21, 2012	September 21, 2022	$ 400	407	417
Subordinated debentures – 4.165% fixed/floating[13]	February 17, 2012	June 1, 2022	$ 500	499	499
Subordinated note – floating[14]	December 14, 2006	December 15, 2021	$ 400	–	400
Subordinated debentures – 4.21% fixed/floating[15]	November 18, 2011	November 18, 2021	$ 550	–	549
Total				**$ 7,180**	$ 7,695

(1) Issued by MLI to Manulife Financial Capital Trust II, interest is payable semi-annually. Manulife Financial Capital Trust II is a non-consolidated related party to the Company. On December 31, 2019 and on every fifth anniversary after December 31, 2019 (the "Interest Reset Date"), the rate of interest will be reset to the yield on five year Government of Canada bonds plus 5.2%. On or after December 31, 2014, with regulatory approval, MLI may redeem the debenture, in whole or in part, at 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 prior to December 31, 2019, or (b) 2.065% if the redemption date is after December 31, 2019, together with accrued and unpaid interest.

(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 non-consolidated related parties to the Company. The note bears interest at the 90-day Bankers' Acceptance rate plus 0.72% and is payable semi-annually. With regulatory approval, JHFC may redeem the note, in whole or in part, at any time, at par, together with accrued and unpaid interest.

(3) Issued by MLI, interest is payable semi-annually. After November 22, 2022 the interest rate is the 90-day Bankers' Acceptance rate plus 1.57% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after November 22, 2022, at par, together with accrued and unpaid interest.

(4) Issued by MFC during the year, interest is payable semi-annually. After May 25, 2021, the interest rate will reset to equal the 5-year Singapore Dollar Swap rate plus 1.97%. With regulatory approval, MFC may redeem the debentures, in whole, but not in part, on May 25, 2021 and thereafter on each interest payment date at a redemption price equal to par, together with accrued and unpaid interest.

(5) Issued by MLI, interest is payable semi-annually. After January 5, 2021 the interest rate is the 90-day Bankers' Acceptance rate plus 0.83% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after January 5, 2021, at par, together with accrued and unpaid interest.

(6) Issued by MLI, interest is payable semi-annually. After June 1, 2020 the interest rate is the 90-day Bankers' Acceptance rate plus 0.72% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after June 1, 2020, at par, together with accrued and unpaid interest.

(7) Issued by MLI, interest is payable semi-annually. After January 15, 2020 the interest rate is the 90-day Bankers' Acceptance rate plus 0.73% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after January 15, 2020, at par, together with accrued and unpaid interest.

(8) Issued by MLI, interest is payable semi-annually. After February 21, 2019 the interest rate is the 90-day Bankers' Acceptance rate plus 0.80% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after February 21, 2019, at par, together with accrued and unpaid interest.

(9) 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 Commissioner of the Office of Financial and Insurance Regulation of the State of Michigan. The carrying value of the surplus notes reflects an unamortized fair value increment of US$26 (2015 – US$29), 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.

(10) Issued by MLI, interest is payable semi-annually. After November 29, 2018 the interest rate is the 90-day Bankers' Acceptance rate plus 0.85% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after November 29, 2018, at par, together with accrued and unpaid interest.

(11) Issued by MLI, interest is payable semi-annually. After February 26, 2018 the interest rate is the 90-day Bankers' Acceptance rate plus 0.95% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after February 26, 2018, at par, together with accrued and unpaid interest.

(12) Issued by the Standard Life Assurance Company of Canada ("SCDA"), which was acquired by MLI on January 30, 2015, as part of the Standard Life acquisition, the subordinated debt was assumed by MLI on July 1, 2015 as a result of SCDA's wind-up into MLI. Interest is payable semi-annually. After September 21, 2017 the interest rate is the 90-day Bankers' Acceptance rate plus 2.10% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after September 21, 2017, at par, together with accrued and unpaid interest.

(13) Issued by MLI, interest is payable semi-annually. After June 1, 2017 the interest rate is the 90-day Bankers' Acceptance rate plus 2.45% and is payable quarterly. With regulatory approval, MLI may redeem the debentures, in whole or in part, on or after June 1, 2017, at par, together with accrued and unpaid interest.

(14) On December 15, 2016, JHFC, a wholly owned subsidiary of MFC, redeemed in full the subordinated notes with MFLLC, a subsidiary of MFLP, at par.

(15) On November 18, 2016, MLI redeemed in full the 4.21% subordinated debentures at par.

(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 a debt instrument 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, 2016, fair value of capital instruments was $7,417 (2015 – $7,916). Capital instruments were categorized in Level 2 of the fair value hierarchy (2015 – Level 2).

Note 13 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.

	2016		2015	
For the years ended December 31,	Number of shares (in millions)	Amount	Number of shares (in millions)	Amount
Balance, January 1	**110**	**$ 2,693**	110	$ 2,693
Issued, Class 1 shares, Series 21[1]	**17**	**425**	–	–
Converted, Class 1 shares, Series 3[2]	**(2)**	**(42)**	–	–
Issued, Class 1 shares, Series 4[2]	**2**	**42**	–	–
Issued, Class 1 shares, Series 23[3]	**19**	**475**	–	–
Issuance costs, net of tax	**–**	**(16)**	–	–
Balance, December 31	**146**	**$ 3,577**	110	$ 2,693

[1] On February 25, 2016, MFC issued 16 million of Rate Reset Class 1 Shares Series 21 at a price of $25 per share to raise gross proceeds of $400 and, on March 3, 2016, MFC issued an additional 1 million Class 1 Shares Series 21 pursuant to the exercise in full by the underwriters of their option to purchase additional Class 1 Shares Series 21, for total gross proceeds of $425.

[2] MFC did not exercise its right to redeem all or any of the outstanding Class 1 Shares Series 3 on June 19, 2016 (the earliest redemption date). 1,664,169 of 8,000,000 Class 1 Shares Series 3 were converted, on a one-for-one basis, into Floating Rate Class 1 Shares Series 4 on June 20, 2016. 6,335,831 Class 1 Shares Series 3 remain outstanding at an annual fixed dividend rate of 2.178% for a five year period commencing on June 20, 2016.

[3] On November 22, 2016, MFC issued 19 million of Rate Reset Class 1 Shares Series 23 at a price of $25 per share to raise gross proceeds of $475.

Further information on the preferred shares outstanding is as follows.

As at December 31, 2016	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],[7]	December 6, 2011	3.891%	December 19, 2021	8	200	**195**
Series 7[4],[5]	February 22, 2012	4.60%	March 19, 2017	10	250	**244**
Series 9[4],[5]	May 24, 2012	4.40%	September 19, 2017	10	250	**244**
Series 11[4],[5]	December 4, 2012	4.00%	March 19, 2018	8	200	**196**
Series 13[4],[5]	June 21, 2013	3.80%	September 19, 2018	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**
Total				146	$ 3,650	**$ 3,577**

[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. With the exception of Class A Series 2, Class A Series 3 and Class 1 Series 4 preferred shares, MFC may redeem each series, in whole or in part, at par, on the earliest redemption date or every five years thereafter. 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% and Series 23 – 3.83%.

[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 will equal 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 5 on December 19, 2016 (the earliest redemption date). Dividend rate for Class 1 Shares Series 5 was reset as specified in footnote 4 above to an annual fixed rate of 3.891% for a five year period commencing on December 20, 2016.

(b) Common shares

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

For the years ended December 31,	2016 Number of shares (in millions)	2016 Amount	2015 Number of shares (in millions)	2015 Amount
Balance, January 1	**1,972**	**$ 22,799**	1,864	$ 20,556
Issued on exercise of stock options and deferred share units	**3**	**66**	2	37
Issued in exchange for subscription receipts[1]	**–**	**–**	106	2,206
Total	**1,975**	**$ 22,865**	1,972	$ 22,799

[1] On September 15, 2014, as part of the financing of the transaction related to the purchase of the Canadian-based operations of Standard Life, MFC issued 105,647,334 subscription receipts through a combination of a public offering and a private placement with the Caisse de dépôt et placement du Québec. The net cash proceeds from the sale of the subscription receipts were held by an escrow agent, in a restricted account, until closing of the transaction on January 30, 2015. Each subscription receipt entitled the holder to automatically receive, without payment of additional consideration or further action, one common share of the Company together with an amount equal to the per share dividends the Company declared on its common shares for record dates which occur in the period from September 15, 2014 up to January 29, 2015, net of any applicable withholding taxes.

(c) Earnings per share

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

For the years ended December 31,	2016	2015
Basic earnings per common share	**$ 1.42**	$ 1.06
Diluted earnings per common share	**1.41**	1.05

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,	2016	2015
Weighted average number of common shares (in millions)	**1,973**	1,962
Dilutive stock-based awards[1] (in millions)	**4**	7
Dilutive convertible instruments (in millions)	**–**	8
Weighted average number of diluted common shares (in millions)	**1,977**	1,977

[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 14 million (December 31, 2015 – 5 million) anti-dilutive stock-based awards.

(d) Quarterly dividend declaration subsequent to year end

On February 8, 2017, the Company's Board of Directors approved a quarterly dividend of $0.205 per share on the common shares of MFC, payable on or after March 20, 2017 to shareholders of record at the close of business on February 22, 2017.

The Board also declared dividends on the following non-cumulative preferred shares, payable on or after March 19, 2017 to shareholders of record at the close of business on February 22, 2017.

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 – $0.117863 per share
Class 1 Shares Series 5 – $0.275 per share
Class 1 Shares Series 7 – $0.2875 per share
Class 1 Shares Series 9 – $0.275 per share
Class 1 Shares Series 11 – $0.25 per share
Class 1 Shares Series 13 – $0.2375 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 – $0.388664 per share

Note 14 Capital Management

(a) Capital Management

The Company monitors and manages its consolidated capital in compliance with the Minimum Continuing Capital and Surplus Requirement ("MCCSR") guideline, issued by the Office of the Superintendent of Financial Institutions ("OSFI"). Under this regime, the Company's consolidated available capital is measured against a required amount of risk capital determined in accordance with the guideline.

The Company's operating activities are mostly conducted within MLI or its subsidiaries. MLI is regulated by OSFI and is also subject to consolidated risk-based capital requirements using the OSFI MCCSR framework. Some affiliate reinsurance business is undertaken outside the MLI consolidated group.

OSFI will be implementing a revised approach to the regulatory capital framework in Canada to come into effect in 2018. In September 2016, OSFI released the final Life Insurance Capital Adequacy Test ("LICAT") guideline that will replace the MCCSR framework in 2018.

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 own risk assessments. The Company monitors against these internal targets and initiates actions appropriate to achieving its business objectives.

The following measure of consolidated capital serves as the foundation of the Company's 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 OSFI guideline.

Consolidated capital

As at December 31,	2016	2015
Total equity	$ 42,823	$ 41,938
Adjusted for AOCI loss on cash flow hedges	(232)	(264)
Total equity excluding AOCI on cash flow hedges	43,055	42,202
Qualifying capital instruments	7,180	7,695
Total capital	**$ 50,235**	$ 49,897

(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 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 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.

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 15 Stock-Based Compensation

(a) Stock options plans

Under MFC's Executive Stock Option Plan ("ESOP"), deferred share units and stock options are granted to selected individuals. Options provide the holder with the right to purchase common shares of MFC at an exercise price equal to the higher of the prior day or prior five day average closing market price of common shares on the Toronto Stock Exchange on the date the options were 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

	2016		2015	
For the years ended December 31,	Number of options (in millions)	Weighted average exercise price	Number of options (in millions)	Weighted average exercise price
Outstanding, January 1	**30**	**$ 20.72**	30	$ 20.82
Granted	**6**	**17.65**	4	22.01
Exercised	**(3)**	**15.49**	(2)	15.33
Expired	**(2)**	**32.92**	(2)	30.43
Forfeited	**(1)**	**21.04**	–	23.06
Outstanding, December 31	**30**	**$ 19.80**	30	$ 20.72
Exercisable, December 31	**19**	**$ 20.25**	20	$ 21.45

	Options outstanding			Options exercisable		
For the year ended December 31, 2016	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)
$11.08 – $20.99	**20**	**$ 16.63**	**5.30**	**13**	**$ 16.31**	**3.75**
$21.00 – $29.99	**7**	**$ 21.69**	**6.82**	**3**	**$ 21.61**	**5.86**
$30.00 – $40.38	**3**	**$ 38.73**	**0.70**	**3**	**$ 38.73**	**0.70**
Total	**30**	**$ 19.80**	**5.26**	**19**	**$ 20.25**	**3.66**

The weighted average fair value of each option granted in 2016 has been estimated at $3.78 (2015 – $4.84) using the Black-Scholes option-pricing model. The pricing model uses the following assumptions for these options: risk-free interest rate of 1.50% (2015 –1.75%), dividend yield of 3.00% (2015 – 3.00%), expected volatility of 29.5% (2015 – 29.5%) and expected life of 6.7 (2015 – 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 $19 for the year ended December 31, 2016 (2015 – $16).

(b) Deferred share units plans

In 2000, MFC granted deferred share units ("DSUs") to certain employees under the ESOP. These DSUs vested 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. The number of DSUs outstanding was 633,000 as at December 31, 2016 (2015 – 690,000).

In addition, for certain employees and pursuant to the Company's deferred compensation program, MFC grants DSUs under the ESOP 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 2016, the Company granted 14,000 DSUs (2015 – 315,000) to certain employees of which vest after four years on the day they were granted. In 2016, 27,000 DSUs (2015 – 34,000) were granted to certain employees who elected to defer receipt of all or part of their annual bonus. These DSUs vested immediately. Also, in 2016, 83,000 DSUs (2015 – 85,000) 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.

Fair value of the 254,000 DSUs issued in the year was $23.91 per unit, as at December 31, 2016 (546,000 issued at $20.74 per unit on December 31, 2015).

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 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.

For the years ended December 31, Number of DSUs (in thousands)	**2016**	2015
Outstanding, January 1	**2,542**	2,332
Issued	**254**	546
Reinvested	**97**	75
Redeemed	**(184)**	(411)
Forfeitures and cancellations	**(27)**	–
Outstanding, December 31	**2,682**	2,542

Of the DSUs outstanding as at December 31, 2016, 633,000 (2015 – 690,000) entitle the holder to receive common shares, 1,235,000 (2015 – 1,195,000) entitle the holder to receive payment in cash and 814,000 (2015 – 657,000) entitle the holder to receive payment in cash or common shares, at the option of the holder.

Compensation expense related to DSUs was $1 for the year ended December 31, 2016 (2015 – $5).

The carrying amount of the liability relating to the DSUs as at December 31, 2016 is $26 (2015 – $22) and is included within other liabilities.

(c) Restricted share units and performance share units plans

For the year ended December 31, 2016, 7.6 million RSUs (2015 – 5.6 million) and 1.2 million PSUs (2015 – 0.8 million) were granted to certain eligible employees under MFC's Restricted Share Unit Plan. The fair values of the RSUs and PSUs granted in the year were $23.91 per unit as at December 31, 2016 (2015 – $20.74 per unit). Each RSU/PSU entitles the recipient 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 and PSUs granted in February 2016 vest on the date that is 34 months from the grant date (December 15, 2018), and the related compensation expense is recognized over this period, 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 $110 and $9, respectively, for the year ended December 31, 2016 (2015 – $93 and $15, respectively).

The carrying amount of the liability relating to the RSUs and PSUs as at December 31, 2016 is $196 (2015 – $142) and is included within other liabilities.

(d) Global share ownership plan

MFC's Global Share Ownership Plan ("GSOP") allows qualifying employees to choose 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.

Prior to the Company's acquisition of the Canadian-based operations of Standard Life plc, advance provision had been made on Standard Life's balance sheet for continuing its practice of regularly granting increases in retiree pensions on an non-contractual

ad-hoc basis. In 2016, the Company concluded that increases would no longer be regularly granted, consistent with the treatment of pensions for retirees under other Manulife plans. To reflect this change, the advance provision was removed, reducing the net defined benefit liability for the former Standard Life plan by $55 which was recorded through income.

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 remaining 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 plan obligations are for plans in the U.S., Canada, Japan, and Taiwan. There are also disability welfare plans in Canada and the U.S.

The largest of these pension and retiree welfare plans are the primary defined benefit plans for employees in the U.S. and Canada. These are considered to be the material plans that are the subject of the disclosures 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 and retiree welfare plans

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

Actuarial valuations to determine the Company's minimum funding contributions for the qualified cash balance plan are required annually. Deficits revealed in the funding valuations must generally be funded over a period of up to seven years. It is expected that there will be no required funding for this plan in 2017. 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 a portion of 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 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 plans are required at least once every three years. Deficits revealed in the funding valuation must generally be funded over a period of not less than five years. For 2017, the required funding for these plans is expected to be $33. 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, 2016, the target asset allocation for the plan was 35% return-seeking assets and 65% 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, 2016, the target asset allocation for the plan was 22% return-seeking assets and 78% liability-hedging assets with an ultimate target of 20% return-seeking assets and 80% liability-hedging assets by 2017. The asset allocation for the plan acquired from Standard Life is 64% return-seeking assets and 36% liability-hedging assets as at December 31, 2016.

(c) Pension and retiree welfare plans

For the years ended December 31,	Pension Plans 2016	Pension Plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
Changes in defined benefit obligation:				
Ending balance prior year	**$ 4,823**	$ 4,089	**$ 713**	$ 648
Acquisitions	**–**	483	**–**	–
Plan mergers[1]	**143**	–	**–**	–
Current service cost	**52**	54	**1**	1
Past service cost	**(57)**	–	**–**	–
Interest cost	**196**	183	**28**	27
Plan participants' contributions	**1**	1	**5**	5
Actuarial losses (gains) due to:				
Experience	**–**	–	**(2)**	(2)
Demographic assumption changes	**(94)**	(4)	**(16)**	–
Economic assumption changes	**116**	(202)	**20**	(10)
Curtailment (gains) losses	**–**	(9)	**–**	–
Benefits paid	**(314)**	(342)	**(50)**	(52)
Impact of changes in foreign exchange rates	**(99)**	570	**(17)**	96
Defined benefit obligation, December 31	**$ 4,767**	$ 4,823	**$ 682**	$ 713

For the years ended December 31,	Pension plans 2016	Pension plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
Change in plan assets:				
Fair value of plan assets, ending balance prior year	**$ 4,122**	$ 3,442	**$ 635**	$ 538
Acquisitions	**–**	406	**–**	–
Plan mergers[1]	**129**	–	**–**	–
Interest income	**169**	156	**25**	23
Employer contributions	**106**	119	**–**	26
Plan participants' contributions	**1**	1	**5**	5
Benefits paid	**(314)**	(342)	**(50)**	(52)
Administration costs	**(7)**	(6)	**(2)**	(1)
Actuarial gains (losses)	**158**	(167)	**8**	(7)
Impact of changes in foreign exchange rates	**(87)**	513	**(18)**	103
Fair value of plan assets, December 31	**$ 4,277**	$ 4,122	**$ 603**	$ 635

[1] In Canada, two smaller pension plans were merged into the primary Manulife pension plan in 2016. Amounts shown represent the value of the defined benefit obligations and assets transferred from the smaller plans into the primary Manulife plan.

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

As at December 31,	Pension plans 2016	Pension plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
Development of net defined benefit liability				
Defined benefit obligation	**$ 4,767**	$ 4,823	**$ 682**	$ 713
Fair value of plan assets	**4,277**	4,122	**603**	635
Deficit	**490**	701	**79**	78
Effect of asset limit[1]	**–**	–	**–**	–
Deficit and net defined benefit liability	**490**	701	**79**	78
Deficit is comprised of:				
Funded or partially funded plans	**(292)**	(133)	**(63)**	(61)
Unfunded plans	**782**	834	**142**	139
Deficit and net defined benefit liability	**$ 490**	$ 701	**$ 79**	$ 78

[1] No reconciliation has been provided for the effect of the asset limit since there was no effect in either year. For the funded pension plans, the present value of the economic benefits available in the form of reductions in future contributions to the plans is significantly greater than the surplus that would be expected to develop.

(e) Disaggregation of defined benefit obligation

As at December 31,	U.S. Plans – Pension plans 2016	U.S. Plans – Pension plans 2015	U.S. Plans – Retiree welfare plans 2016	U.S. Plans – Retiree welfare plans 2015	Canadian Plans – Pension plans 2016	Canadian Plans – Pension plans 2015	Canadian Plans – Retiree welfare plans 2016	Canadian Plans – Retiree welfare plans 2015
Active members	**$ 637**	$ 649	**$ 38**	$ 35	**$ 403**	$ 441	**$ 20**	$ 24
Inactive and retired members	**2,528**	2,685	**502**	540	**1,199**	1,048	**122**	114
Total	**$ 3,165**	$ 3,334	**$ 540**	$ 575	**$ 1,602**	$ 1,489	**$ 142**	$ 138

(f) Fair value measurements

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

As at December 31, 2016	U.S. Plans[1] – Pension plans Fair value	U.S. Plans[1] – Pension plans % of total	U.S. Plans[1] – Retiree welfare plans Fair value	U.S. Plans[1] – Retiree welfare plans % of total	Canadian Plans[2] – Pension plans Fair value	Canadian Plans[2] – Pension plans % of total	Canadian Plans[2] – Retiree welfare plans Fair value	Canadian Plans[2] – Retiree welfare plans % of total
Cash and cash equivalents	**$ 15**	**1%**	**$ 19**	**3%**	**$ 21**	**2%**	**$ –**	**–**
Equity securities[3]	**825**	**28%**	**150**	**25%**	**460**	**34%**	**–**	**–**
Debt securities	**1,834**	**62%**	**427**	**71%**	**809**	**60%**	**–**	**–**
Other investments[4]	**259**	**9%**	**7**	**1%**	**54**	**4%**	**–**	**–**
Total	**$ 2,933**	**100%**	**$ 603**	**100%**	**$ 1,344**	**100%**	**$ –**	**–**

As at December 31, 2015	U.S. Plans[1] – Pension plans Fair value	U.S. Plans[1] – Pension plans % of total	U.S. Plans[1] – Retiree welfare plans Fair value	U.S. Plans[1] – Retiree welfare plans % of total	Canadian Plans[2] – Pension plans Fair value	Canadian Plans[2] – Pension plans % of total	Canadian Plans[2] – Retiree welfare plans Fair value	Canadian Plans[2] – Retiree welfare plans % of total
Cash and cash equivalents	$ 25	1%	$ 21	4%	$ 16	1%	$ –	–
Equity securities[3]	838	28%	161	25%	424	36%	–	–
Debt securities	1,866	63%	446	70%	678	58%	–	–
Other investments[4]	218	8%	7	1%	57	5%	–	–
Total	$ 2,947	100%	$ 635	100%	$ 1,175	100%	$ –	–

[1] All of 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 6% of all U.S. pension and retiree welfare plan assets as at December 31, 2016 (2015 – 6%).

[2] All of the Canadian pension plan assets have daily quoted prices in active markets, except for the real estate, mortgage, and group annuity contract assets. In the aggregate, the latter assets represent approximately 3% of all Canadian pension plan assets as at December 31, 2016 (2015 – 3%).

[3] Equity securities include direct investments in MFC common shares of $1.1 (2015 – $1.0) in the U.S. retiree welfare plan and nil (2015 – nil) in Canada.

[4] Other U.S. plan assets include investment in private equity, timberland and agriculture, and managed futures in 2016. Other Canadian pension plan assets include investment in real estate, mortgages, a global absolute return strategy and a group annuity contract.

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

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

For the years ended December 31,	Pension plans 2016	Pension plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
Defined benefit current service cost[1]	**$ 52**	$ 54	**$ 1**	$ 1
Defined benefit administrative expenses	**7**	6	**2**	1
Past service cost amendments[2]	**(57)**	–	**–**	–
Past service cost curtailments	**–**	(9)	**–**	–
Service cost	**2**	51	**3**	2
Interest on net defined benefit (asset) liability[1]	**27**	27	**3**	4
Defined benefit cost	**29**	78	**6**	6
Defined contribution cost	**69**	68	**–**	–
Net benefit cost	**$ 98**	$ 146	**$ 6**	$ 6

[1] Includes service and interest costs for the two plans merged into the primary Manulife plan for the period from August 1, 2016 to December 31, 2016.

[2] Past service cost amendments include ($55) reflecting the removal of the advance provision made in prior years for continuing non-contractual, ad-hoc increases in pension for Standard Life retirees.

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

For the years ended December 31,	Pension plans 2016	Pension plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
Actuarial gains (losses) on defined benefit obligations:				
Experience	**$ –**	$ –	**$ 2**	$ 2
Demographic assumption changes	**94**	4	**16**	–
Economic assumption changes	**(116)**	202	**(20)**	10
Return on plan assets greater (less) than discount rate	**158**	(167)	**8**	(7)
Total re-measurement effects	**$ 136**	$ 39	**$ 6**	$ 5

(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,	2016	2015	2016	2015	2016	2015	2016	2015
To determine the defined benefit obligation at end of year[1]**:**								
Discount rate	**4.1%**	4.4%	**4.1%**	4.3%	**3.9%**	4.1%	**4.0%**	4.1%
Initial health care cost trend rate[2]	**n/a**	n/a	**8.8%**	9.0%	**n/a**	n/a	**6.0%**	6.1%
To determine the defined benefit cost for the year[1]**:**								
Discount rate	**4.4%**	4.0%	**4.3%**	3.9%	**4.1%**	3.8%	**4.1%**	4.0%
Initial health care cost trend rate[2]	**n/a**	n/a	**9.0%**	8.3%	**n/a**	n/a	**6.1%**	6.3%

[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 8.8% grading to 5.0% for 2032 and years thereafter (2015 – 9.0% grading to 5.0% for 2032) and to measure the net benefit cost was 9.0% grading to 5.0% for 2032 and years thereafter (2015 – 8.3% grading to 5.0% for 2028). In Canada, the rate used to measure the retiree welfare obligation was 6.0% grading to 4.8% for 2026 and years thereafter (2015 – 6.1% grading to 4.8% for 2026) and to measure the net benefit cost was 6.1% grading to 4.8% for 2026 and years thereafter (2015 – 6.3% 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, 2016	U.S.	Canada
Life expectancy (in years) for those currently age 65		
Males	**22.4**	**22.7**
Females	**23.9**	**24.6**
Life expectancy (in years) at age 65 for those currently age 45		
Males	**23.9**	**23.8**
Females	**25.4**	**25.6**

(j) Sensitivity of assumptions on obligation

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, interrelationships with other assumptions may exist.

As at December 31, 2016	Pension plans	Retiree welfare plans
Discount rate:		
Impact of a 1% increase	**$ (452)**	**$ (66)**
Impact of a 1% decrease	**538**	**81**
Health care cost trend rate:		
Impact of a 1% increase	**n/a**	**26**
Impact of a 1% decrease	**n/a**	**(22)**
Mortality rates[1]**:**		
Impact of a 10% decrease	**116**	**18**

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

(k) Maturity profile

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

As at December 31,	Pension plans 2016	Pension plans 2015	Retiree welfare plans 2016	Retiree welfare plans 2015
U.S. plans	**9.2**	9.4	**9.1**	9.0
Canadian plans	**12.7**	13.6	**14.2**	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, were as follows.

	Pension plans		Retiree welfare plans	
For the years ended December 31,	**2016**	2015	**2016**	2015
Defined benefit plans	**$ 106**	$ 119	**$ –**	$ 26
Defined contribution plans	**69**	68	**–**	–
Total	**$ 175**	$ 187	**$ –**	$ 26

The Company's best estimate of expected cash payments for employee future benefits for the year ending December 31, 2017 is $100 for defined benefit pension plans, $73 for defined contribution pension plans and $10 for retiree welfare plans.

Note 17 Interests in Structured Entities

In its capacities as an investor and as an investment manager, the Company has relationships with various types of entities designed to generate investment returns and/or fees. The Company also has relationships with entities that are used to facilitate financing for the Company. Some of these entities may have some or all of 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. Such entities are identified as structured entities (individually "SE" or collectively "SEs").

In assessing the significance of a SE for disclosure purposes, the Company considers the nature of its relationship with the SEs including whether they are sponsored by the Company (i.e. initially organized and managed by the Company). In addition, the significance of the relationship with the SE to the Company is assessed including consideration of factors such as the Company's investment in the SE as a percentage of the Company's total investments, returns from it as a percentage of total net investment income, its size as a percentage of total funds under management and the Company's exposure to any other risks from its involvement with the SE.

The Company does not provide financial or other support to its SEs, without having a contractual obligation to do so.

The Company does not disclose its interests in Mezzanine Funds and Collateralized Debt Obligations within this note as these interests are not significant.

(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 them. 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, 2016, the Company's consolidated timber assets relating to HVPH was $920 (2015 – $891). 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 capital. Further information regarding the Company's mortgage securitization program is included in note 4.

(b) Unconsolidated SEs

Investment SEs

The table below presents the Company's investment and maximum exposure to loss related to 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,	**2016**	2015	**2016**	2015
Leveraged leases[3]	**$ 3,369**	$ 3,549	**$ 3,369**	$ 3,549
Timberland companies[4]	**736**	648	**749**	677
Real Estate companies[5]	**327**	263	**327**	263
Total	**$ 4,432**	$ 4,460	**$ 4,445**	$ 4,489

[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 as a result of a natural disaster in the case of the timber companies, or foreclosure in the case of affordable housing 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 following table presents the Company's interests and maximum exposure to loss from significant unconsolidated financing SEs.

	Company's interests[1]	
As at December 31,	**2016**	2015
Manulife Finance (Delaware), L.P.[2]	**$ 876**	$ 1,438
Manulife Financial Capital Trust II[3]	**1,000**	1,000
Total	**$ 1,876**	$ 2,438

(1) The Company's interests include amounts borrowed from the SEs and the Company's investment in their subordinate 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, 12 and 18.

(3) This entity is an open-ended trust that is used to facilitate the Company's financing. Refer to note 12.

(i) Other invested assets

The Company has investment relationships with a variety of other entities ("Other Entities"), which result from its direct investment in their debt and/or equity and which have been assessed for control. This category includes, but is 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. The majority of these Other Entities are not sponsored by the Company. The Company believes that its relationships with these Other Entities are 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 as a result of its relationships with Other Entities is limited to its investment in them and amounts committed to be invested but not yet funded. The income that the Company generates from these entities is recorded in net investment income and other comprehensive income. 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 numerous securitization vehicles sponsored by other parties, including private issuers and government sponsored issuers, in order to generate investment returns which are recorded in net 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 4. 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 outlines the securitized holdings by the type and asset quality.

	2016				2015
As at December 31,	CMBS	RMBS	ABS	Total	Total
AAA	**$ 943**	**$ 73**	**$ 1,253**	**$ 2,269**	$ 2,183
AA	**–**	**–**	**393**	**393**	110
A	**–**	**–**	**592**	**592**	719
BBB	**4**	**–**	**217**	**221**	137
BB and below	**16**	**1**	**21**	**38**	66
Total company exposure	**$ 963**	**$ 74**	**$ 2,476**	**$ 3,513**	$ 3,215

(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 believes that its 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 4. 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, 2016 was $1,903 (2015 – $1,582). The Company's retail mutual fund assets under management as at December 31, 2016 were $170,930 (2015 – $160,020).

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 involve its activities as a provider of insurance protection or wealth management products, relating to reinsurance, or in 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.

Two class actions against the Company were certified and pending in Quebec and Ontario. The actions were based on allegations that the Company failed to meet its disclosure obligations related to its exposure to market price risk in its segregated funds and variable annuity guaranteed products. On January 31, 2017, we announced we reached an agreement to settle both of these class actions for a total payment of $69 million. The entire payment is covered by insurance and the Company made no admission of liability. The settlement agreement is subject to approval by both the Ontario and Quebec Courts.

Two putative class actions against John Hancock Life Insurance Company (U.S.A.) ("JHUSA") are pending, one in New York and one in California, 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. The Company believes that its COI calculations have been, and continue to be, in accordance with the terms of the policies and intends to vigorously defend these actions. Both cases are in the discovery stage and it is premature to attempt to predict any outcome or range of outcomes for these matters.

(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 $7,505 (2015 – $5,680) of outstanding investment commitments as at December 31, 2016, of which $268 (2015 – $172) mature in 30 days, $2,665 (2015 – $1,743) mature in 31 to 365 days and $4,572 (2015 – $3,765) 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, 2016, letters of credit for which third parties are beneficiary, in the amount of $83 (2015 – $109), 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 and Class B Shares of MLI and any other class of preferred shares that rank on a 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 17, 2012; $200 issued on February 25, 2013; $250 issued on November 29, 2013; $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.

On July 1, 2015, MFC provided a subordinated guarantee of $400 for the subordinated debentures assumed by MLI as part of the Standard Life acquisition on the wind up of the Standard Life Assurance Company of Canada ("SCDA") on that date. SCDA was acquired by MLI on January 30, 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, 2016	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidating adjustments	Total consolidated amounts	MFLP
Total revenue	**$ 518**	**$ 53,051**	**$ 1,941**	**$ (2,173)**	**$ 53,337**	**$ 44**
Net income (loss) attributed to shareholders	**2,929**	**3,455**	**(898)**	**(2,557)**	**2,929**	**(1)**

For the year ended December 31, 2015	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidating adjustments	Total consolidated amounts	MFLP
Total revenue	$ 401	$ 33,877	$ 1,491	$ (1,339)	$ 34,430	$ 100
Net income (loss) attributed to shareholders	2,191	1,983	118	(2,101)	2,191	28

Condensed Consolidated Statements of Financial Position

As at December 31, 2016	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidating adjustments	Total consolidated amounts	MFLP
Invested assets	**$ 161**	**$ 315,201**	**$ 6,507**	**$ –**	**$ 321,869**	**$ 6**
Total other assets	**48,073**	**99,718**	**15,136**	**(79,292)**	**83,635**	**1,085**
Segregated funds net assets	**–**	**315,177**	**–**	**–**	**315,177**	**–**
Insurance contract liabilities	**–**	**296,896**	**19,122**	**(18,513)**	**297,505**	**–**
Investment contract liabilities	**–**	**3,275**	**–**	**–**	**3,275**	**–**
Segregated funds net liabilities	**–**	**315,177**	**–**	**–**	**315,177**	**–**
Total other liabilities	**6,402**	**66,999**	**1,539**	**(13,039)**	**61,901**	**882**

As at December 31, 2015	MFC (Guarantor)	MLI consolidated	Other subsidiaries of MFC on a combined basis	Consolidating adjustments	Total consolidated amounts	MFLP
Invested assets	$ 122	$ 301,645	$ 5,739	$ –	$ 307,506	$ 5
Total other assets	43,248	97,926	15,491	(74,549)	82,116	1,651
Segregated funds net assets	–	313,249	–	–	313,249	–
Insurance contract liabilities	–	284,647	18,197	(17,556)	285,288	–
Investment contract liabilities	–	3,497	–	–	3,497	–
Segregated funds net liabilities	–	313,249	–	–	313,249	–
Total other liabilities	2,211	69,334	1,445	(14,091)	58,899	1,447

(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 the purpose of providing collateral for the counterparty. In the event of the Company's default, the counterparty is entitled to apply the collateral in order 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 were as follows.

	2016		2015	
As at December 31,	Debt securities	Other	Debt securities	Other
In respect of:				
Derivatives	**$ 4,678**	**$ 99**	$ 4,619	$ 20
Regulatory requirements	**409**	**78**	445	82
Real estate	**–**	**22**	–	41
Repurchase agreements	**255**	**–**	268	–
Non-registered retirement plans in trust	**–**	**464**	–	455
Other	**3**	**174**	2	139
Total	**$ 5,345**	**$ 837**	$ 5,334	$ 737

(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 $966 (2015 – $1,056). Payments by year are included in the "Risk Management" section of the Company's 2016 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.

Note 19 Segmented Information

The Company's reporting segments are Asia, Canadian and U.S. Divisions and the Corporate and Other segment. Each division has profit and loss responsibility and develops products, services and distribution strategies based on the profile of its business and the needs of its market. The significant product and service offerings of each segment are as follows:

Protection (Asia, Canadian and U.S. Divisions). Offers a variety of individual life insurance and individual and group long-term care insurance. Products are distributed through multiple distribution channels, including insurance agents, brokers, banks, financial planners and direct marketing.

Wealth and Asset Management (Asia, Canadian and U.S. Divisions). Offers pension contracts and mutual fund products and services. These businesses also offer a variety of retirement products to group benefit plans. These businesses distribute products through multiple distribution channels, including insurance agents and brokers affiliated with the Company, securities brokerage firms, financial planners, pension plan sponsors, pension plan consultants and banks.

Other Wealth (Asia, Canadian and U.S. Divisions). Includes annuities, single premium and banking products. Manulife Bank of Canada offers a variety of deposit and credit products to Canadian customers. Annuity contracts provide non-guaranteed, partially guaranteed and fully guaranteed investment options through general and separate account products. These businesses distribute products through multiple distribution channels, including insurance agents and brokers affiliated with the Company, financial planners and banks.

Corporate and Other Segment. Comprised of investment performance on assets backing capital, net of amounts allocated to operating divisions and financing costs; external asset management business; Property and Casualty ("P&C") Reinsurance Business; as well as run-off reinsurance operations including variable annuities and accident and health.

Certain allocation methodologies are employed in the preparation of segmented financial information. Indirect expenses are allocated to business segments using allocation formulas applied on a consistent basis, while capital is apportioned to the Company's business segments using a risk based methodology. The Consolidated Statements of Income impact of changes in actuarial methods and assumptions (refer to note 8) is reported in the Corporate and Other segment.

The 2015 assets and earnings (net investment income and income tax recovery (expense)) on assets backing capital allocated to each operating segment have been reclassified to align with the methodology used in 2016.

By segment

As at and for the year ended December 31, 2016	Asia Division	Canadian Division	U.S. Division	Corporate and Other	Total
Revenue					
Premium income					
Life and health insurance	$ 12,111	$ 4,366	$ 6,703	$ 88	$ 23,268
Annuities and pensions	3,474	606	284	–	4,364
Net premium income	15,585	4,972	6,987	88	27,632
Net investment income	2,143	4,255	7,980	146	14,524
Other revenue	1,566	3,480	5,591	544	11,181
Total revenue	19,294	12,707	20,558	778	53,337
Contract benefits and expenses					
Life and health insurance	10,435	5,207	10,829	806	27,277
Annuities and pensions	2,913	1,179	2,765	–	6,857
Net benefits and claims	13,348	6,386	13,594	806	34,134
Interest expense	146	305	45	517	1,013
Other expenses	4,241	4,279	5,619	722	14,861
Total contract benefits and expenses	17,735	10,970	19,258	2,045	50,008
Income (loss) before income taxes	1,559	1,737	1,300	(1,267)	3,329
Income tax recovery (expense)	(243)	(250)	(166)	463	(196)
Net income (loss)	1,316	1,487	1,134	(804)	3,133
Less net income (loss) attributed to:					
Non-controlling interests	115	–	–	28	143
Participating policyholders	60	1	–	–	61
Net income (loss) attributed to shareholders	$ 1,141	$ 1,486	$ 1,134	$ (832)	$ 2,929
Total assets	$ 92,783	$ 214,467	$ 384,010	$ 29,421	$ 720,681

As at and for the year ended December 31, 2015	Asia Division	Canadian Division	U.S. Division	Corporate and Other	Total
Revenue					
Premium income					
Life and health insurance	$ 8,707	$ 3,926	$ 6,997	$ 90	$ 19,720
Annuities and pensions	2,788	504	913	–	4,205
Premiums ceded, net of commission and additional consideration relating to Closed Block reinsurance transaction (Note 3)	–	–	(7,996)	–	(7,996)
Net premium income	11,495	4,430	(86)	90	15,929
Net investment income	1,073	2,511	4,685	134	8,403
Other revenue	1,434	3,124	5,350	190	10,098
Total revenue	14,002	10,065	9,949	414	34,430
Contract benefits and expenses					
Life and health insurance	6,724	4,201	(124)	624	11,425
Annuities and pensions	2,488	584	2,844	–	5,916
Net benefits and claims	9,212	4,785	2,720	624	17,341
Interest expense	124	471	59	447	1,101
Other expenses	3,272	4,057	5,273	768	13,370
Total contract benefits and expenses	12,608	9,313	8,052	1,839	31,812
Income (loss) before income taxes	1,394	752	1,897	(1,425)	2,618
Income tax recovery (expense)	(175)	(279)	(437)	563	(328)
Net income (loss)	1,219	473	1,460	(862)	2,290
Less net income (loss) attributed to:					
Non-controlling interests	77	–	–	(8)	69
Participating policyholders	37	(7)	–	–	30
Net income (loss) attributed to shareholders	$ 1,105	$ 480	$ 1,460	$ (854)	$ 2,191
Total assets	$ 82,584	$ 202,419	$ 385,011	$ 32,857	$ 702,871

The results of the Company's business segments differ from geographic segmentation primarily as a consequence of segmenting the results of the Company's Corporate and Other segment into the different geographic segments to which its businesses pertain.

By geographic location

For the year ended December 31, 2016	Asia	Canada	U.S.	Other	Total
Revenue					
Premium income					
Life and health insurance	**$ 12,184**	**$ 3,909**	**$ 6,705**	**$ 470**	**$ 23,268**
Annuities and pensions	**3,474**	**606**	**284**	**–**	**4,364**
Net premium income	**15,658**	**4,515**	**6,989**	**470**	**27,632**
Net investment income	**2,368**	**4,096**	**7,880**	**180**	**14,524**
Other revenue	**1,608**	**3,443**	**6,105**	**25**	**11,181**
Total revenue	**$ 19,634**	**$ 12,054**	**$ 20,974**	**$ 675**	**$ 53,337**

For the year ended December 31, 2015	Asia	Canada	U.S.	Other	Total
Revenue					
Premium income					
Life and health insurance	$ 8,776	$ 3,454	$ 6,999	$ 491	$ 19,720
Annuities and pensions	2,788	504	913	–	4,205
Premiums ceded, net of commission and additional consideration relating to Closed Block reinsurance transaction (Note 3)	–	–	(7,996)	–	(7,996)
Net premium income	11,564	3,958	(84)	491	15,929
Net investment income	1,128	2,884	4,273	118	8,403
Other revenue	1,455	2,891	5,740	12	10,098
Total revenue	$ 14,147	$ 9,733	$ 9,929	$ 621	$ 34,430

Note 20 Related Parties

(a) Transactions with related parties

Related party transactions have been in the normal course of business and taken place at terms that would exist in arm's-length transactions.

(b) Transactions with certain related parties

Transactions with MFLP, a wholly owned unconsolidated partnership, and MFCT, a wholly owned unconsolidated trust, are described in note 11, 12 and 17.

(c) 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. Accordingly, the summary of compensation of key management personnel is as follows.

For the years ended December 31,	2016	2015
Short-term employee benefits	**$ 33**	$ 34
Post-employment benefits	**3**	3
Share-based payments	**44**	44
Termination benefits	**4**	1
Other long-term benefits	**3**	3
Total	**$ 87**	$ 85

Note 21 Subsidiaries

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

As at December 31, 2016 (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 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
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 (US) 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
John Hancock Insurance Company of Vermont	Vermont, U.S.A.	Captive insurance subsidiary
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

As at December 31, 2016 (100% owned unless otherwise noted in brackets beside company name)	Address	Description
Manulife Resources Limited	Calgary, Canada	Holds oil and gas properties
Manulife Property Limited Partnership	Toronto, Canada	Holds oil and gas royalties
Manulife Western Holdings Limited Partnership	Calgary, Canada	Holds oil and gas properties
Manulife Property Limited Partnership II	Toronto, Canada	Holds oil and gas royalties and foreign bonds and equities
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	Asset management company
Manulife Life Insurance Company	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 (91.9%)[1]	Bangkok, Thailand	Life insurance company
Manulife Asset Management (Thailand) Company Limited (94.2%)[1]	Bangkok, Thailand	Investment management company
Manulife Holdings Berhad (59.5%)	Kuala Lumpur, Malaysia	Holding company
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
John Hancock Reassurance Company Ltd.	Hamilton, Bermuda	Provides life, annuity and long-term care reinsurance to affiliates

[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 98.0% and 98.5% respectively.

Note 22 Segregated Funds

The Company manages a number of segregated funds on behalf of policyholders. Policyholders are provided 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 2016 MD&A provides information regarding 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, 2016 and 2015.

	Ranges in per cent	
Type of fund	**2016**	2015
Money market funds	**2 to 3%**	2 to 3%
Fixed income funds	**14 to 15%**	12 to 16%
Balanced funds	**22 to 24%**	23 to 27%
Equity funds	**59 to 61%**	56 to 59%

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 considered to be structured entities. The carrying value and change in segregated funds net assets are as follows.

Segregated funds net assets

As at December 31,	2016	2015
Investments at market value		
Cash and short-term securities	**$ 4,524**	$ 4,370
Debt securities	**15,651**	15,269
Equities	**12,458**	13,079
Mutual funds	**278,966**	277,015
Other investments	**4,552**	4,538
Accrued investment income	**201**	205
Other assets and liabilities, net	**(644)**	(729)
Total segregated funds net assets	**$ 315,708**	$ 313,747
Composition of segregated funds net assets		
Held by policyholders	**$ 315,177**	$ 313,249
Held by the Company	**531**	498
Total segregated funds net assets	**$ 315,708**	$ 313,747

Total segregated funds net assets are presented separately on the Consolidated Statements of Financial Position. Fair value related information of segregated funds is disclosed in note 4(g).

Changes in segregated funds net assets

For the years ended December 31,	2016	2015
Net policyholder cash flow		
Deposits from policyholders	**$ 33,130**	$ 32,785
Net transfers to general fund	**(878)**	(798)
Payments to policyholders	**(39,731)**	(41,174)
	(7,479)	(9,187)
Investment related		
Interest and dividends	**15,736**	17,487
Net realized and unrealized investment gains (losses)	**4,097**	(16,080)
	19,833	1,407
Other		
Management and administration fees	**(4,386)**	(4,337)
Acquired from Standard Life	**–**	32,171
Impact of changes in foreign exchange rates	**(6,007)**	36,959
	(10,393)	64,793
Net additions	**1,961**	57,013
Segregated funds net assets, beginning of year	**313,747**	256,734
Segregated funds net assets, end of year	**$ 315,708**	$ 313,747

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 guarantee liabilities are recorded within the Company's insurance contract liabilities. Assets supporting these guarantees are recognized in invested assets according to their investment type. The "Risk Management" section of the Company's 2016 MD&A provides information regarding the risks associated with variable annuity and segregated fund guarantees.

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 consolidating 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 and are registered with the Commission. The deferred annuity contracts contain variable investment options and 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 14.

In the United States, insurance laws in Michigan, New York, Massachusetts and Vermont, 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 14.

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 consolidating 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, 2016	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Assets					
Invested assets	$ 161	$ 109,063	$ 213,043	$ (398)	$ 321,869
Investments in unconsolidated subsidiaries	47,758	6,457	17,504	(71,719)	–
Reinsurance assets	–	51,537	10,069	(26,654)	34,952
Other assets	315	28,718	41,723	(22,073)	48,683
Segregated funds net assets	–	174,917	142,400	(2,140)	315,177
Total assets	$ 48,234	$ 370,692	$ 424,739	$ (122,984)	$ 720,681
Liabilities and equity					
Insurance contract liabilities	$ –	$ 147,504	$ 177,524	$ (27,523)	$ 297,505
Investment contract liabilities	–	1,251	2,027	(3)	3,275
Other liabilities	252	28,892	41,653	(21,772)	49,025
Long-term debt	5,689	–	7	–	5,696
Capital instruments	461	627	6,226	(134)	7,180
Segregated funds net liabilities	–	174,917	142,400	(2,140)	315,177
Shareholders' equity	41,832	17,501	53,912	(71,413)	41,832
Participating policyholders' equity	–	–	248	–	248
Non-controlling interests	–	–	742	1	743
Total liabilities and equity	$ 48,234	$ 370,692	$ 424,739	$ (122,984)	$ 720,681

Condensed Consolidated Statement of Financial Position

As at December 31, 2015	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Assets					
Invested assets	$ 122	$ 108,736	$ 199,031	$ (383)	$ 307,506
Investments in unconsolidated subsidiaries	42,919	6,684	17,653	(67,256)	–
Reinsurance assets	–	52,027	9,579	(26,180)	35,426
Other assets	329	30,271	39,026	(22,936)	46,690
Segregated funds net assets	–	178,421	136,753	(1,925)	313,249
Total assets	$ 43,370	$ 376,139	$ 402,042	$ (118,680)	$ 702,871
Liabilities and equity					
Insurance contract liabilities	$ –	$ 147,401	$ 164,928	$ (27,041)	$ 285,288
Investment contract liabilities	–	1,324	2,177	(4)	3,497
Other liabilities	524	30,131	40,939	(22,243)	49,351
Long-term debt	1,687	–	16	150	1,853
Capital instruments	–	1,209	7,185	(699)	7,695
Segregated funds net liabilities	–	178,421	136,753	(1,925)	313,249
Shareholders' equity	41,159	17,653	49,266	(66,919)	41,159
Participating policyholders' equity	–	–	187	–	187
Non-controlling interests	–	–	591	1	592
Total liabilities and equity	$ 43,370	$ 376,139	$ 402,042	$ (118,680)	$ 702,871

Condensed Consolidated Statement of Income

For the year ended December 31, 2016	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Revenue					
Net premium income	**$ –**	**$ 5,021**	**$ 22,611**	**$ –**	**$27,632**
Net investment income (loss)	**475**	**6,191**	**9,102**	**(1,244)**	**14,524**
Net other revenue	**43**	**2,569**	**11,108**	**(2,539)**	**11,181**
Total revenue	**518**	**13,781**	**42,821**	**(3,783)**	**53,337**
Contract benefits and expenses					
Net benefits and claims	**–**	**10,340**	**24,748**	**(954)**	**34,134**
Commissions, investment and general expenses	**11**	**3,272**	**13,016**	**(1,840)**	**14,459**
Other expenses	**259**	**59**	**2,086**	**(989)**	**1,415**
Total contract benefits and expenses	**270**	**13,671**	**39,850**	**(3,783)**	**50,008**
Income (loss) before income taxes	**248**	**110**	**2,971**	**–**	**3,329**
Income tax (expense) recovery	**28**	**251**	**(475)**	**–**	**(196)**
Income (loss) after income taxes	**276**	**361**	**2,496**	**–**	**3,133**
Equity in net income (loss) of unconsolidated subsidiaries	**2,653**	**211**	**572**	**(3,436)**	**–**
Net income (loss)	**$ 2,929**	**$ 572**	**$ 3,068**	**$ (3,436)**	**$ 3,133**
Net income (loss) attributed to:					
Non-controlling interests	**$ –**	**$ –**	**$ 143**	**$ –**	**$ 143**
Participating policyholders	**–**	**(48)**	**61**	**48**	**61**
Shareholders	**2,929**	**620**	**2,864**	**(3,484)**	**2,929**
	$ 2,929	**$ 572**	**$ 3,068**	**$ (3,436)**	**$ 3,133**

Condensed Consolidated Statement of Income

For the year ended December 31, 2015	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Revenue					
Net premium income prior to Closed Block reinsurance	$ –	$ 3,161	$ 20,764	$ –	$ 23,925
Premiums ceded, net of commission and additional consideration relating to Closed Block reinsurance transaction	–	(6,813)	(1,766)	583	(7,996)
Net premium income	–	(3,652)	18,998	583	15,929
Net investment income (loss)	476	4,014	4,837	(924)	8,403
Net other revenue	(75)	2,110	11,069	(3,006)	10,098
Total revenue	401	2,472	34,904	(3,347)	34,430
Contract benefits and expenses					
Net benefits and claims	–	(1,146)	19,540	(1,053)	17,341
Commissions, investment and general expenses	19	3,158	11,949	(2,114)	13,012
Other expenses	185	267	1,187	(180)	1,459
Total contract benefits and expenses	204	2,279	32,676	(3,347)	31,812
Income (loss) before income taxes	197	193	2,228	–	2,618
Income tax (expense) recovery	(57)	276	(547)	–	(328)
Income (loss) after income taxes	140	469	1,681	–	2,290
Equity in net income (loss) of unconsolidated subsidiaries	2,051	80	549	(2,680)	–
Net income (loss)	$ 2,191	$ 549	$ 2,230	$ (2,680)	$ 2,290
Net income (loss) attributed to:					
Non-controlling interests	$ –	$ –	$ 69	$ –	$ 69
Participating policyholders	–	–	31	(1)	30
Shareholders	2,191	549	2,130	(2,679)	2,191
	$ 2,191	$ 549	$ 2,230	$ (2,680)	$ 2,290

Consolidated Statement of Cash Flows

For the year ended December 31, 2016	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Operating activities					
Net income (loss)	**$ 2,929**	**$ 572**	**$ 3,068**	**$ (3,436)**	**$ 3,133**
Adjustments for non-cash items in net income (loss)					
Equity in net income of unconsolidated subsidiaries	**(2,653)**	**(211)**	**(572)**	**3,436**	**–**
Increase (decrease) in insurance contract liabilities	**–**	**5,225**	**12,789**	**–**	**18,014**
Increase (decrease) in investment contract liabilities	**–**	**58**	**(58)**	**–**	**–**
(Increase) decrease in reinsurance assets	**–**	**(1,444)**	**602**	**–**	**(842)**
Amortization of (premium) discount on invested assets	**–**	**(5)**	**83**	**–**	**78**
Other amortization	**2**	**284**	**407**	**–**	**693**
Net realized and unrealized (gains) losses and impairment on assets	**(9)**	**(917)**	**(1,878)**	**–**	**(2,804)**
Deferred income tax expense (recovery)	**3**	**391**	**(629)**	**–**	**(235)**
Stock option expense	**–**	**(1)**	**20**	**–**	**19**
Cash provided by operating activities before undernoted items	**272**	**3,952**	**13,832**	**–**	**18,056**
Dividends from unconsolidated subsidiary	**1,950**	**111**	**–**	**(2,061)**	**–**
Changes in policy related and operating receivables and payables	**171**	**(1,290)**	**99**	**–**	**(1,020)**
Cash provided by (used in) operating activities	**2,393**	**2,773**	**13,931**	**(2,061)**	**17,036**
Investing activities					
Purchases and mortgage advances	**(32)**	**(34,656)**	**(69,371)**	**–**	**(104,059)**
Disposals and repayments	**–**	**32,343**	**49,658**	**–**	**82,001**
Changes in investment broker net receivables and payables	**–**	**(35)**	**(151)**	**–**	**(186)**
Investment in common shares of subsidiaries	**(5,706)**	**–**	**–**	**5,706**	**–**
Net cash decrease from purchase of subsidiaries and businesses	**–**	**–**	**(495)**	**–**	**(495)**
Capital contribution to unconsolidated subsidiaries	**–**	**(350)**	**–**	**350**	**–**
Return of capital from unconsolidated subsidiaries	**–**	**1**	**–**	**(1)**	**–**
Notes receivables from affiliates	**–**	**–**	**544**	**(544)**	**–**
Notes receivable from parent	**–**	**–**	**344**	**(344)**	**–**
Notes receivable from subsidiaries	**(6)**	**(40)**	**–**	**46**	**–**
Cash provided by (used in) investing activities	**(5,744)**	**(2,737)**	**(19,471)**	**5,213**	**(22,739)**
Financing activities					
Increase (decrease) in repurchase agreements and securities sold but not yet purchased	**–**	**–**	**(23)**	**–**	**(23)**
Issue of long-term debt, net	**3,899**	**–**	**–**	**–**	**3,899**
Redemption of long-term debt	**–**	**–**	**(158)**	**–**	**(158)**
Issue of capital instruments, net	**479**	**–**	**–**	**–**	**479**
Redemption of capital instruments	**–**	**–**	**(949)**	**–**	**(949)**
Funds borrowed (repaid), net	**–**	**(1)**	**(18)**	**–**	**(19)**
Secured borrowings from securitization transactions	**–**	**–**	**847**	**–**	**847**
Changes in deposits from Bank clients, net	**–**	**–**	**(157)**	**–**	**(157)**
Shareholders' dividends paid in cash	**(1,593)**	**–**	**–**	**–**	**(1,593)**
Dividends paid to parent	**–**	**–**	**(2,061)**	**2,061**	**–**
Contributions from (distributions to) non-controlling interests, net	**–**	**–**	**10**	**–**	**10**
Common shares issued, net	**66**	**–**	**5,706**	**(5,706)**	**66**
Preferred shares issued, net	**884**	**–**	**–**	**–**	**884**
Capital contributions by parent	**–**	**–**	**350**	**(350)**	**–**
Return of capital to parent	**–**	**–**	**(1)**	**1**	**–**
Notes payable to affiliates	**–**	**(544)**	**–**	**544**	**–**
Notes payable to parent	**–**	**–**	**46**	**(46)**	**–**
Notes payable to subsidiaries	**(344)**	**–**	**–**	**344**	**–**
Cash provided by (used in) financing activities	**3,391**	**(545)**	**3,592**	**(3,152)**	**3,286**
Cash and short-term securities					
Increase (decrease) during the year	**40**	**(509)**	**(1,948)**	**–**	**(2,417)**
Effect of foreign exchange rate changes on cash and short-term securities	**(1)**	**(149)**	**(197)**	**–**	**(347)**
Balance, beginning of year	**122**	**4,445**	**12,435**	**–**	**17,002**
Balance, end of year	**161**	**3,787**	**10,290**	**–**	**14,238**
Cash and short-term securities					
Beginning of year					
Gross cash and short-term securities	**122**	**4,938**	**12,825**	**–**	**17,885**
Net payments in transit, included in other liabilities	**–**	**(493)**	**(390)**	**–**	**(883)**
Net cash and short-term securities, beginning of year	**122**	**4,445**	**12,435**	**–**	**17,002**
End 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, end of year	**$ 161**	**$ 3,787**	**$ 10,290**	**$ –**	**$ 14,238**
Supplemental disclosures on cash flow information:					
Interest received	**$ –**	**$ 4,523**	**$ 5,966**	**$ 61**	**$ 10,550**
Interest paid	**210**	**144**	**1,397**	**(768)**	**983**
Income taxes paid	**35**	**68**	**738**	**–**	**841**

Consolidated Statement of Cash Flows

For the year ended December 31, 2015	MFC (Guarantor)	JHUSA (Issuer)	Other subsidiaries	Consolidation adjustments	Consolidated MFC
Operating activities					
Net income (loss)	$ 2,191	$ 549	$ 2,230	$ (2,680)	$ 2,290
Adjustments for non-cash items in net income (loss)					
Equity in net income of unconsolidated subsidiaries	(2,051)	(80)	(549)	2,680	–
Increase (decrease) in insurance contract liabilities	–	(3,223)	10,675	–	7,452
Increase (decrease) in investment contract liabilities	–	59	144	–	203
(Increase) decrease in reinsurance assets, excluding the impact of Closed Block reinsurance transaction	–	830	561	–	1,391
Amortization of (premium) discount on invested assets	–	–	90	–	90
Other amortization	2	105	473	–	580
Net realized and unrealized (gains) losses and impairment on assets	(191)	606	3,072	–	3,487
Deferred income tax expense (recovery)	5	150	(498)	–	(343)
Stock option expense	–	–	16	–	16
Cash provided by operating activities before undernoted items	(44)	(1,004)	16,214	–	15,166
Dividends from unconsolidated subsidiary	4,000	398	291	(4,689)	–
Cash decrease due to Closed Block reinsurance transaction	–	(1,336)	(687)	–	(2,023)
Changes in policy related and operating receivables and payables	38	1,429	(4,236)	–	(2,769)
Cash provided by (used in) operating activities	3,994	(513)	11,582	(4,689)	10,374
Investing activities					
Purchases and mortgage advances	–	(31,061)	(46,080)	–	(77,141)
Disposals and repayments	179	29,893	36,870	–	66,942
Changes in investment broker net receivables and payables	–	31	71	–	102
Investment in common shares of subsidiaries	(2,392)	–	–	2,392	–
Net cash decrease from purchase of subsidiaries and businesses	–	–	(3,808)	–	(3,808)
Capital contribution to unconsolidated subsidiaries	–	(447)	–	447	–
Return of capital from unconsolidated subsidiaries	–	59	–	(59)	–
Notes receivable from parent	–	–	(31)	31	–
Notes receivable from subsidiaries	30	–	180	(210)	–
Cash provided by (used in) investing activities	(2,183)	(1,525)	(12,798)	2,601	(13,905)
Financing activities					
(Decrease) increase in repurchase agreements and securities sold but not yet purchased	–	–	(212)	–	(212)
Redemption of long-term debt	(2,243)	–	–	–	(2,243)
Issue of capital instruments, net	–	–	2,089	–	2,089
Redemption of capital instruments	(350)	–	–	–	(350)
Funds borrowed (repaid), net	–	(39)	(7)	–	(46)
Secured borrowings from securitization transactions	–	–	436	–	436
Changes in deposits from Bank clients, net	–	–	(351)	–	(351)
Shareholders' dividends paid in cash	(1,427)	–	–	–	(1,427)
(Distributions to) contributions from non-controlling interests, net	–	–	61	–	61
Common shares issued, net	37	–	2,392	(2,392)	37
Dividends paid to parent	–	(291)	(4,398)	4,689	–
Gain (loss) on intercompany transaction	–	18	(18)	–	–
Capital contributions by parent	–	–	447	(447)	–
Return of capital to parent	–	–	(59)	59	–
Notes payable to parent	–	(180)	(30)	210	–
Notes payable to subsidiaries	31	–	–	(31)	–
Cash provided by (used in) financing activities	(3,952)	(492)	350	2,088	(2,006)
Cash and short-term securities					
Increase (decrease) during the year	(2,141)	(2,530)	(866)	–	(5,537)
Effect of foreign exchange rate changes on cash and short-term securities	3	1,056	1,043	–	2,102
Balance, beginning of year	2,260	5,918	12,259	–	20,437
Balance, end of year	122	4,444	12,436	–	17,002
Cash and short-term securities					
Beginning of year					
Gross cash and short-term securities	2,260	6,311	12,508	–	21,079
Net payments in transit, included in other liabilities	–	(393)	(249)	–	(642)
Net cash and short-term securities, beginning of year	2,260	5,918	12,259	–	20,437
End of year					
Gross cash and short-term securities	122	4,938	12,825	–	17,885
Net payments in transit, included in other liabilities	–	(494)	(389)	–	(883)
Net cash and short-term securities, end of year	$ 122	$ 4,444	$ 12,436	$ –	$17,002
Supplemental disclosures on cash flow information:					
Interest received	$ 11	$ 4,512	$ 5,422	$ (20)	$ 9,925
Interest paid	212	131	1,135	(407)	1,071
Income taxes paid	–	20	767	–	787

Note 24 Comparatives

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